POCKET PHYSIO

Analgesic - Anti-inflammatory
Rehab/Sport - Urogynaecologic - Aesthetic

MANUAL

User Instructions

New Age Italia srl
Via De Brozzi, 3 - 48022 Lugo (RA)
Tel:+39-0545.32019 - Telefax: +39-0545.369028
Web: www.newageitalia.it - E-mail: info@newageitalia.it

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ATTENTION: PLEASE READ THIS MANUAL CAREFULLY BEFORE USING POCKET PHYSIO

Chap.1 - PRESENTATION

1.1 - What is POCKET PHYSIO?

Constant research in the medical apparatus field for physiotherapy has led to the creation of the new electro-therapy system consisting of **POCKET PHYSIO**, containing the specific protocols for the most commonly used applications with different wave forms. POCKET PHYSIO is a professional portable electrotherapy and allows the user to perform:

- **analgesic electrotherapy for every kind of pain;**
- **anti-inflammatory electrotherapy with drug carriage;**
- **electrostimulation for normal muscles (sport/rehab applications);**
- **electrostimulation for denervated muscles;**
- **electrotherapy for urogynecologic treatments;**
- **electrotherapy for aesthetic treatments.**

The vast assortment of currents and pre-set programs available, the option of setting and memorising customised protocols, technical innovation and the ease of use make this an extremely versatile and pioneering product in the field of neuromuscular stimulators for physiotherapeutic use.

The Physio **software** allows the user to generate the main currents used in therapeutic rehab or training electrotherapy:

- TENS, diadynamic and bipolar interferential, direct current for ionophoresis and galvanic therapy are all currents having analgesic effects;
- Two-phase rectangular current, Kotz current and Faradic current are **excitomotor currents** for **normoinnervated muscles** (healthy);
- alternating Rectangular, Triangular and Exponential are **excitomotor currents** for denervated muscles.

1.2 - Fields of use

The new POCKET PHYSIO are primarily intended for the physiotherapeutic field, as this is considered their most apt application; however, their simplicity of use means that they are addressed not only to physiotherapists, operators in the field of physiatrics and sports doctors, but also to whoever wishes to improve his or her well-being in the home. A **doctor must always be consulted**, however, before embarking on any treatment, so that electro-therapy is correctly matched to any active pathology.

1.3 - Characteristics

POCKET PHYSIO PRO comes with the following features:

- **PROGRAMS**: 135 preset programs + 30 free.
- **CURRENTS**: 10 different waveforms.
- **CHANNELS**: 2 independent channels.
- **POWER SUPPLY**: double power supply: rechargeable battery + 230V.

POCKET PHYSIO REHAB comes with the following features:

- **PROGRAMS**: 58 preset programs + 10 free.
- **CURRENTS**: 5 different waveforms.
- **CHANNELS**: 2 indipendent channels.
- **POWER SUPPLY**: double power supply: rechargeable battery + 230V.

POCKET PHYSIO IONOTENS comes with the following features:

- **PROGRAMS**: 34 preset programs + 4 free.
- **CURRENTS**: 2 different waveforms.
- **CHANNELS**: 2 indipendent channels.
- **POWER SUPPLY**: double power supply: rechargeable battery + 230V.

POCKET PHYSIO URO comes with the following features:

- **PROGRAMS**: 20 preset programs + 4 free.
- **CURRENTS**: 2 different waveforms.
- **CHANNELS**: 2 independent channels.
- **POWER SUPPLY**: double power supply: rechargeable battery + 230V.

Chap.2 - SAFETY RULES

The following paragraphs specify the main operations that you must carry out before starting stimulation. These include preventive controls both on the equipment to be used and on the person on whom the stimulation must be applied.

2.1 - General rules

Before using the device for the first time, you must read this manual carefully. In order to use it properly, before activating or connecting it to the patient, you must:

(1) make a sight check, in order to identify any **sign of damage;**
(2) take an accurate view of every **notice** applied on the device;
(3) remove any **fluid containers** from the area of the device, since it is not protected against their entry (IP 20);
(4) make sure the **accessories are available** in order to apply the stimulation (electrodes, output cables, etc.).

2.2 - Contraindications

Electrostimulation must not be carried out:

(1) on pacemaker carriers or on individuals affected by heart trouble or heart rhythm trouble;
(2) on the front surface of the neck, since this could lead to larynx spasms;
(3) on the side of the neck, due to the sensitivity of the carotid body;
(4) in the abdomen and lumbar-sacral region, with pregnant women;
(5) on areas affected by skin lesions, mucose, altered local sensitivity, infective processes, inflammations, phlebitis, thrombophlebitis;
(6) in case of implanted electronic equipment (e.g. pacemaker) in the area immediately below the area being stimulated;

(7) near areas to be treated which host metal synthetic media and intra-tissue metals (like prostheses, osteosynthesis materials, spirals, screws, plates), especially if single-phase currents – like diadynamic, faradic and direct current (for ionophoresis and Galvanic therapy) are used;
(8) on areas affected by tumours and in the abdominal/lumbar area when hepatolithiasis or nephrolithiasis (liver or kidney stones) are present;
(9) in areas affected by dermatitis, cutaneous hypoaesthesia, allergies to substances used during the treatment, heat-pain anaesthesia, if using ionophoresis.
(10) Keep it out of the reach of children.

2.3 - Precautions during use

We suggest you **consult a physician** and use the electrostimulator under his or her control in the following cases:

(1) when you use the neuromuscular stimulation for analgesic purposes on patients affected by painful syndromes, in order to identify the reason behind their pathology, especially when the symptoms do not regress within a few days after the analgesic stimulation has been applied;
(2) applying the electrodes on the face;
(3) near segments to be treated which host metal synthetic media and intra-tissue metals (like prostheses, osteosynthesis materials, spirals, screws, plates);
(4) patients suffering from epilepsy and Parkinson's disease, as the sensitivity threshold could be altered;
(5) women who are certainly or supposedly pregnant, applying the stimulation only in peripheral areas, such as the top or bottom limbs;
(6) applying the electrodes in areas affected by tenon or muscle injury;
(7) patients affected by spastic paralysis.

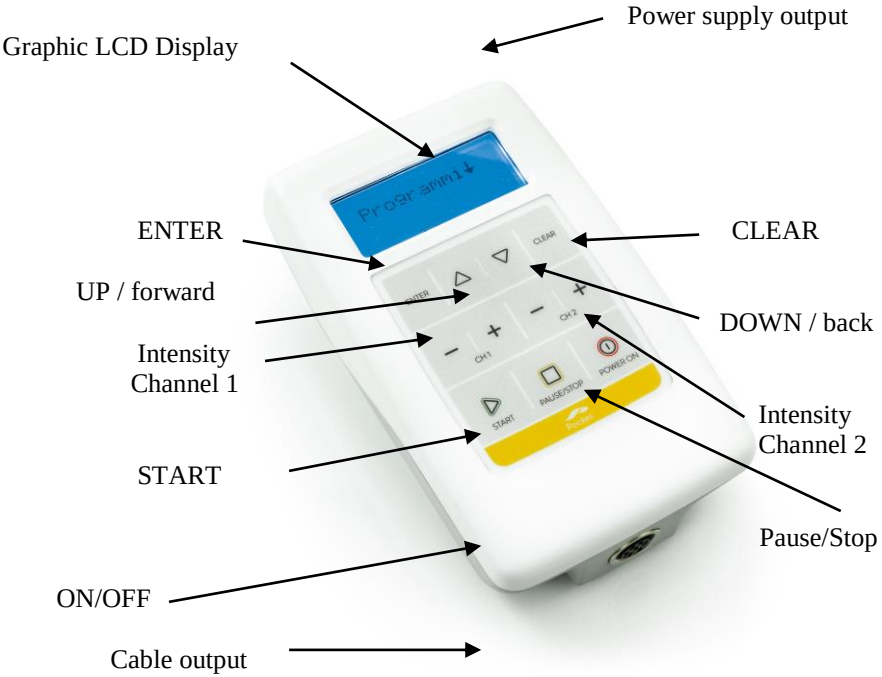
We suggest you do not apply the electrostimulator electrodes:

(1) above the eye bulb;
(2) directly on delicate areas, such as the middle of the breast, the groin or the armpits, or on sensitive areas;
(3) never place the heart muscle between the positive and the negative poles, or never put one electrode on the front of the torso and the other on the back near the heart area;
(4) on the same patients, to avoid the danger of crossed contamination.

2.4 - Special notices

(1) We suggest you do not use the electrostimulator **after a heavy meal**, since it could prolong the digestion process by summoning blood towards another part of the body.
(2) Should any sign of **tachychardia, extrasystolia**, or **failure to tolerate the stimulation** appear during the treatment, you should **suspend** the treatment to bring the whole situation back to normal.
(3) At the end of the session, the area the electrode was applied on may **redden slightly**, or else a capillary may burst in the area. In this case we suggest you **use a lighter program** or **a lower stimulation intensity**.

Chap.3 - OPERATION



3.1 - Connecting the applied parts

To start stimulation, you must first connect all the components needed to use the device: power supply (only for electric power use), the stimulation cable plus any splitting cables and the electrodes, or else the probe (URO).

3.1.1 - Connecting the power supply

The power supply may be used for **current operation** or else **battery recharging** (the latter takes place only **if the device has been turned off**). In order to use the power supply, you must connect it to both the power socket and the feeding socket of the device. Once you have connected it, you can turn the device on and use it normally. This operation can also be carried out **during operation**, for example if you are running a program and the **battery run out** symbol starts to flash (turn off at the end of the session in order to recharge the battery).

3.1.2 - Connecting the output cable and the splitting cables

The stimulation **output cable** (**PRO**, **REHAB** and **IONOTENS** models) have been designed so as not to twist the wires, and to distinguish the polarity and connecting channels in a simple fashion. The colours of the final plugs and the polarities are as follows:

- **Blue Plug**: negative pole Channel 1
- **Yellow Plug**: positive pole Channel 1
- **Black Plug**: negative pole Channel 2
- **Red Plug**: positive pole Channel 2

The stimulation cable must be fitted into its output socket when the device is turned off; use the **splitting cables** only if you have to make a 3-electrode application for each channel, connecting them to the **positive** cables (yellow and red).

NOTE: the probe (anal or vaginal - not included) for URO applications must be completely fitted into the treating area (both metal electrodes inside).

3.1.3 - Connecting the electrodes to the cable

The electrodes are fitted into the plugs through their connecting cable or else through the hole for fitting the conducting rubber electrodes (see the polarity in the enclosed colour photos); each electrode is connected to a cable. The **electrodes have no polarity of their own** and may be connected indifferently to either the positive or negative cables. Only if one uses **three pre-gelled electrodes per channel** via the splitting cables, we suggest you always connect the rectangular (larger) electrodes to the negative cables (blue and black) and the square (smaller) electrodes to the positive cables (all red on the splitting cables).

NOTE: for current to pass, **both the negative and the positive pole must always be connected** for each channel used.

⚠: This device controls the parts applied which are connected to the outputs (cables, electrodes, etc.). Faulty connection may lead to an error in the protection of the device. For further information, please refer to the section on "Error messages".

3.1.4 - Applying electrodes to the skin

Before the application you should clean the skin carefully using alcohol or water and soap.
To apply the **pre-gelled electrodes**, take off the plastic support, lift the electrode from one edge using two fingers and keep the support in place with the other hand. Apply the electrode on the skin with the pre-gelled adhesive part, and **press on every part for a few seconds** so it adheres completely and uniformly (the gel is warmed by contact with the skin, and this makes it adhere better). At the end of the application, put the electrodes back on their supports (if you lose them, fit the two electrodes into a single support on both sides).

ATTENTION: never leave the pre-gelled part exposed to the air, otherwise the gel will dry and become unusable (in this case, bathe it immediately with water).

The **conducting rubber electrodes** can be used in two different ways:

1. With **conducting gel** – spread the gel from the bottle evenly over the smooth part of the electrodes. To obtain better conduction, apply it also on the area to be treated. Apply the electrodes to the surface involved, and fasten them in place using elastic straps or adhesive tape.
2. With **sponge envelopes** – wet the sponges thoroughly with water and squeeze them out slightly, so they do not drip. Fit the electrodes into the sponges of the same size, and fasten them in place with elastic straps.

3.2 - Starting the stimulation

After connecting all the parts applied (fitting the cable into the device, connecting the electrodes to the cables and applying to the skin) and after positioning yourself in the proper manner, you can **start the electrostimulation session**.

3.2.1 - Turning on the device

To turn the device on, press the **ON/OFF button**; the display will show a welcome message, which runs from right to left, along with the version of software housed in the memory of the device, then it will **position itself on the first program** of the menu chosen (P.1 TENS 50).

3.2.2 - Choosing the program

To start the electrostimulation session, you must **choose the program** you want to run by going through the program menu using **forward/back selection** (buttons with triangle pointing up and down). The programs are listed in the tables contained in the section on "Pre-set programs" for each current; when the display shows the name of the program you want (e.g. P.7 CERVICAL), **press ENTER** to confirm.

NOTE: the current used for each selected protocol is shown by the symbol on the first line at the top of the display (see the sections 3.6 and 4.1).

3.2.3 - Starting the program

The word "START" flashes on the display; **press the START STOP button** to start.

NOTE: if the program is a muscle workout (e.g. TONING), with burst operation (with stop and go action) the display shows the message "NOTICE C." and, below, the word "YES"; this refers to the activation of the **contraction signal** which comes just before the muscular contraction (action phase). To clear the signal, press the "-" (minus) button of Channel 1 or 2, which will change the word into "NO"; in order to proceed, press **ENTER**, then **START STOP** to start.

3.2.4 - Intensity adjustment

After the START, **the display will show the TIMER**, which diminishes automatically, and the two intensity values for the two output channels, initially equal to "000". To **set a suitable stimulation intensity, press the "+"button or buttons** of the channel or channels being used (1 and/or 2) until you feel the effect you want, **which changes depending on the program** you have chosen:

- Slow or fast massage / contraction (muscle stimulation)
- vibration / itch (analgesic stimulation, ionophoresis).

If the program is a **muscle workout** (e.g. TONING), with burst operation (muscle contractions alternating with massaging pauses) **you must set two intensities**: the **action** phase where the muscle "pulls" and the **pause,** where the stimulation produces a slow massage (single impulses); when the pause starts, the intensity set during the action will halve itself automatically. This function is eliminated when one changes the intensity of the pause for the first time. **Both the intensities can be only adjusted during the relevant phase (action or pause).** The device memorizes both values which are alternately displayed following the working times automatically decided by the TIMER. Both phases (action and pause) are marked by the presence of the figure of a little man next to the two intensity

values, with arms raised during the action phase and absent during the recovery pause (see section on **Symbols).**
NOTE: with ionophoresis, diadynamics DF and CP and when you use the probe of URO applications you can only use **Channel 1**.

ATTENTION: during the program, it is advisable to increase the intensity of the stimulation: in order to increase the muscle workout or else when itching is less felt than at the beginning; on the other hand, diminish the intensity if the current becomes bothersome. If it becomes unbearable, press PAUSE/STOP to stop the stimulation.

3.2.5 - Pause/stop on the program

You can **stop the program** at any time by pressing the "**PAUSE STOP**" button; the TIMER will stop and the intensity of the stimulation will go down to zero. You can then **start the program up again** by pressing "START" and re-setting the intensity, or else **stop the program** by pressing "PAUSE STOP" again. Should the program not be stopped, the stimulation will go on until the TIMER reaches 0; the display will then go back to the Program Selection Menu, displaying the name of the program which has just been finished.

NOTE: in programs with **more phases**, featuring a change of the parameters, when switching from one stage to the next, the **stimulation continues** keeping the set intensity; we suggest you to **adjust the intensity** about the new feelings brought by the change of stage.

3.3 - Turning the device off

To turn the device off, **keep the ON/OFF button pressed for a few seconds**. Should the device not be turned off after the end of a program and if you do not start another one, **it will go off by itself after a few minutes**. The device may also go off during stimulation **if the battery has run out completely.** At this point, you can continue current stimulation by connecting the power supply. In this case, at the end of the session **you must recharge the battery**.

3.4 - Storing electrodes and sponge envelopes

If you use the **pre-gelled electrodes,** at the end of the session you must **put them back at once** on their plastic supports and seal them inside the bag. In case of wear (e.g. when the gel does not adhere perfectly) you should **wet the pre-gelled part with water** before putting the electrodes back on their plastic supports, and – if they do not adhere well to the skin – before application as well; after a few applications, or else if you do not use the device for a long time, or if the temperature is high (for example, in summer) we suggest you **keep the packages in the refrigerator**.
If you have used the **rubber electrodes** with gel you must use blotting paper to remove the gel and clean the surface using a damp cloth with a little detergent; just dry the **sponge envelopes** using a dry cloth.

3.5 - Fast guide

Following is a summary of all the operations to be carried out – **after connecting cables and placing electrodes** - to begin and finish a pre-set program.

1. Turn the device on by pressing the button **(l)** (ON/OFF).
2. Choose the program using UP/DOWN buttons and press ENTER.

3. Activate/deactivate the contraction beep using (+)/(-) keys (only in muscle workout programs with action and pause phases) and press ENTER.
4. Press START.
5. Set the intensity using the (+) button only in the connected Channels (1 and/or 2); for **muscle workouts**, two settings (action and pause).
6. At the end of the program:
   - **to continue** - go back to item 2;
   - **to finish** - turn the device off by pressing the (I) ON/OFF button.

3.6 - Symbols on the display

The symbols on the display (words, digits and icons) specify the operation of the device; some are present at all times:

- Waveform of the program (first line at the top of the display):
  - **TENS**
  - **DIADYNAMIC**
  - **BIPOLAR INTERFERENTIAL**
  - **TWO-PHASE RECTANGULAR**
  - **FARADIC**
  - **KOTZ CURRENT**
  - **ALTERNATE RECTANGULAR SINGLE-PHASE**
  - **TRIANGULAR**
  - **EXPONENTIAL**
  - **IONOPHORESIS**
- Number of the program (P.X) on the central line to the left;
- Symbol of the battery or of power mains (in the middle to the bottom)
- Number of Phases of the program (F.1/1, F.1/3, etc.) to the bottom right.

3.6.1 - Display during the stimulation

During the stimulation, besides the symbols which are always present, the following symbols are displayed:

- Decreasing TIMER (minutes and seconds) in the top middle;
- Two numbers of three digits, showing the intensity of stimulation of Channel 1 (to the left) and of Channel 2 (to the right) in milliamperes (mA);
- Indication of the current phase - F.1/1, F.1/2, etc. (bottom right)
- Bell (bottom right corner) – only if the acoustic contraction signal has been selected.

In **muscle workout programs**, on the sides of the two intensities **during the action** (muscular contraction) there appears the drawing of a little man with **raised arms,** which disappears at the end of the contraction. The little man reappears **before the end of the pause** with **lowered arms** in order to notify the arrival of contraction, at the same time as the **acoustic signal** (if activated).

3.7 - Setting a free program

To make a new program using customized parameters, on the Program selection menu choose one of the free programs marked "----------" located at the end of the list. There are 10 free programs available in mod. PHYSIO/REHAB and 4 in mod. IONOTENS/URO, and they can be raised to 30 on request.

3.7.1 - Choosing the current

Press **ENTER** when the display shows "----------". You will thus enter the free program and the word "CURRENT" will appear; in order to choose the current you want, use the + and – buttons of Channel 1 or 2. These will allow you to scroll through the current symbols at the top of the display (see the section on "Symbols on the display"). Press ENTER to confirm the current and enter the phase setting: the display will show the words "**PHASE 1**".

3.7.2 - Setting the phases

Press ENTER at the item "PHASE 1" to enter the Menu for setting the parameters of the first Phase.

⚠: The 6 phases can be **set** in rising order from 1 to 6. You cannot set a phase without having first set the previous phases (you will commit an ERROR - see the section on "Error messages").

3.7.2.1- Setting the phase parameters

You can set the values of the parameters in the following manner:

- the **name of the parameter** which can be modifies appears on the display (see the section on Free programs);
- the **value of the parameter** is displayed in the middle of the display with three digits, and can be modified using the buttons + and – of channel 1 or 2.
- the displayed values **are the only values admitted** for the chosen parameter. For **each parameter** follow the instructions of the section on "Setting a free program**",** present in every section regarding the individual kind of current;
- to switch from one parameter to the next or the previous one, use the buttons and .
- The icon shows you are setting the first of the six available phases.

NOTE: if you set the value "**CNT**" (continuous operation) on the parameter **T.Contr.** or **T.Stim.,** the **PAUSE values cannot be modified** (it stays "---").

Press ENTER to confirm the string "**End Sel**", the last item for setting the parameters of the Phase. You can now exit and memorize the phase (the display will show the words "PHASE 1 OK"). During the setting of the parameters of a phase **the CLEAR button is not enabled**, in order to prevent you accidentally leaving without having finished setting the phase. You can now set other phases (up to 6). Press the button TRIANGLE DOWN to select the following phases, then ENTER and repeat all the settings of the parameters. After setting the Phases, you can scroll down the Menu in order to **start the new program** (press ENTER under item **RUN**), **memorize the program** (press ENTER under item **MEMO**) or else **exit the setting** (press ENTER uder item **EXIT**) in order to go back to the Program Selection Menu without having memorized the free program.

3.7.3 - Memorizing a free program

The MEMORIZING phase is needed when the new free program has been set, or else when a free program which is already present has been modified. In the first case, first press ENTER under item MEMO. This will automatically display a general program name (e.g. "Prog01") which can be modified, with the first character flashing. In the second case, on the other hand, the name of the program before modification will be displayed, always with the first character flashing. To key in the new name (up to 10 letters): use the buttons + and - of channel 1 or 2 to select the letters from the available set ("A…Z, a…z, 0…9") and the TRIANGLE UP and TRIANGLE DOWN buttons to place the cursor on the letter after or before the one to be changed. After writing in the name you want, confirm with ENTER to memorize the program which has been set or modified, and go back to the program selection menu. Here you will see the name chosen for the program.

3.7.4 - Exiting the setting of the free program

To exit during the setting of the Phases select the item **Exit** and press ENTER to confirm. This way, any changes or variations made on the free program **will not be memorized** and you will be taken back to the Program selection menu. If you were modifying an already set free program, the name of the extant program will be displayed again, or else – if you have exited after having started to set a new program – the empty string "---------" will be displayed again.

3.7.5 - Modifying or deleting a free program

When the free program has already been memorized, you will be able to **modify or delete it** afterwards: once you have chosen the program press ENTER; the display will show the item RUN. Press the button to move to **MODIFY** and press ENTER to enter the phases, changing the desired parameters and again memorizing the new program (repeat the setting operations as above); to delete, select the item **CLEAR** (under the item MODIFY) and press ENTER (the display will again show the line "----------").

3.8 - Setting language and contrast

To access the Pocket setting menu, only when the device is off, hold the UP button and press **(l)** (ON/OFF) to turn on. Use the DOWN button to select the items of this menu (CONTRAST, LANGUAGE).

3.8.1 - Changing the language

The user of Pocket can use the device **displaying the words of the menus in Italian, English, French, German or Spanish**. To choose the language you want to use, select the item "**Language"** and confirm by pressing ENTER; on the following menu, choose the language you want and confirm by pressing ENTER. Press CLEAR to go back to the settings menu.

3.8.2 - Contrast adjustment on the display

To change the contrast on the display choose the item “CONTRAST” and confirm by pressing ENTER. You can perform the adjustment using the buttons “+” and “–“ of channels 1 or 2.

3.8.3 - Exiting the setting menu

After the settings, select “**End”** and press ENTER. The device will turn on.

3.9 - Error messages

Following is a list of the special messages which appear on the display when there is a working problem with the device or a setting error.

3.9.1 - Technical service needed

Should the self-diagnosis system of the device reveal a **fault**, the display will show the message “SERVICE” for 10 seconds then the device will go off automatically. In this case, it must be **sent to the authorised service laboratory** (see the section on MAINTENANCE).

3.9.2 - Electrodes disconnected

Should one of the cables get detached during the stimulation, or should one of the electrodes **not adhere** properly to the skin, the display will show the message “ELECTRODES” and **the stimulation will stop** with the intensity going back to zero, as during the pause phase. The channel with the detached electrode will have an intensity equal to 0 (zero) and will flash. After having fitted the cable or the electrode properly **press START and reset the intensity**.

3.9.3 - Errors during the setting of the free programs

The error symbol ⚠ appears for a few seconds to advise the user that a faulty operation was made in the following cases:

- **during phase setting -** trying to enter a phase before setting the previous one;
- **trying to start up a free program without having set any phase** (you can set also only one phase is enough to save or begin a new program).

If one complies with the sequence of the phases during the setting and carries out the parameter setting procedure properly, no error symbol will appear.

Chap.4 - CURRENTS

4.1 - Currents available

The table below lists the currents generated by POCKET PHYSIO PRO.

CURRENT	SYMBOL	EFFECTS
TENS		**Analgesic**
Diadynamic		
Bipolar interferential		
Ionophoresis		**Antinflammatory**
Two-phase rectangular		**Stimulation of normal muscles**
Kotz current		
Faradic		
Alternating rectangular		**Stimulation of denerved muscles**
Triangular		
Exponential		

4.2 - Currents with analgesic effect

Analgesic currents are defined as those which can reduce sensitivity to pain, such as **TENS**, **diadynamic** and **bipolar interferential currents**. Their analgesic action is often attributed to gate control theory, proposed by Melzack and Wall in 1965, according to which pain impulses coming from the back to the brain and also those originating from tactile stimuli are transmitted on the nerve fibres. Therefore, if the common transmission pathway is invested with an excess of tactile stimulation, generated by electric currents striking the large-calibre myelin fibres, painful sensations are impossible to transmit. Numerous pain symptomatologies, **especially relating to articulation and muscles**, can be aided using treatments with similar currents, both in chronic cases and in cases where pharmacological treatment is impossible. However, application must not be generalised, nor indiscriminate, because the perception of pain is an important element of feedback between doctor and patient and the objective is still to find and eliminate the cause of the pain, not just to relieve the symptom. Also, in a case where the apparatus is used at home, directly by the patient, it is advisable to consult a doctor whenever the symptoms are not reduced after a few days of treatment.

4.3 - Direct current

Direct current is a constant-intensity unidirectional current, used in ionophoresis therapies, in cases of **rheumatic pathologies**, and in galvanic therapy, in cases of **rheumatic pathologies** and **muscular hypotrophy**.

4.4 - Currents for stimulation of normal muscles

In order to obtain selective contraction of the single muscles and large normoinnervated motor units, voluntary exercise can be augmented by electro-therapy treatment with **two-phase rectangular**, **Kotz** or **faradic** current**.** The application of an electrical stimulation of suitable form, intensity and duration generates a tetanic contraction on the fibres with involvement of the motor units, which, at high intensity, is almost total. Thus, by choosing the right current, healthy muscle (free of motor neurone lesions) can be developed both after

a trauma to **accelerate muscle recuperation** and preserve the previously-damaged joint structures, and during training to **increase muscle performance**.
The currents used for excitomotor stimulation on normoinnervated muscles are generated by trains of pulses and characterised by periods of muscular CONTRACTION followed by PAUSE periods in which the muscles recuperate.

4.5 - Currents for stimulation of denerved muscles

Although the nerve regeneration process is not influenced, for slowing degenerative phenomena which onset after a motoneuron lesion (loss of weight and trophism, reduction in calibre, number, elasticity and extendibility of the fibres, increase in connective tissue) a muscle with reversible denervation is stimulated, until the spontaneous process of re-innervation reoccurs on the foundation of a contractile base which allows sufficient functional recuperation. The stimulation, with **rectangular, alternated, triangular** and **exponential** currents, must be selected on the basis of a precise diagnosis of the locus and extent of the damage to the peripheral motoneuron, but must also be applied rapidly and daily because of the existence of a maximum level of muscular atrophy in the first days. As much treatment as possible should be given, vigorous and protracted over the whole period of denervation, if it is to be effective, while taking care not to tire the fibres.

4.6 - URO and aesthetic currents

Rectangular biphase and TENS currents are also available for other functions, such as uroginecologic therapy (rehab and analgesic) and aesthetic treatments (fat burning, local thinning, cellulite, lymphodrainage, face toning).

Chap.5 - TENS

Symbol on the display:  **(programs covered by CE0476 certification)**

5.1 - Analgesic action

TENS, "Transcutaneous electrical nerve stimulation", is the most characteristic of the analgesic effect currents, as it gives a transcutaneous electrical nerve stimulation that is selective in the peripheral nerves and is obtained with very brief two-phase pulses. The analgesic action, it is thought, is enjoyed not only thanks to the above-described "gate control" theory, but also by emission of endorphins, which inhibit transmission of the pain-giving pulses, responsible for the sensation of pain. The consequent raising of the pain threshold helps maintain the analgesic effect for a considerable time after treatment; also, the duration of the therapy can be changed for each session.

5.2 - How to apply the electrodes

There are **various application techniques** for TENS, connected to the different analgesic effects:

a) **Conventional TENS** is characterised by:

Pulse duration	**Very short** (30-150 μs).
Pulse frequency	High (80-140 Hz).
Duration of treatment	30-60 minutes, further extendable ([7]) for short-term benefits.
Analgesic effect	Rapid intervention, but short (1-3 hours), limited to the stimulated zone.
Intensity of stimulation	Increase gradually so that tingling is felt at all times.
Sensations felt	Light and pleasant tingling.
Warning	Periodically change electrode position during long treatments to avoid erythema.

b) **Electro-acupuncture TENS** is characterised by:

Pulse duration	**High** (150-250 μs).
Pulse frequency	**Low** (1-5 Hz).
Duration of treatment	30-40 minutes.
Analgesic effect	Late intervention, at least 30 minutes from the end of the treatment, but longer than conventional TENS. Effect can be attributed to emission of endorphins.
Intensity of stimulation	Increase gradually so that the contraction is always felt.
Sensations felt	Slight muscular contractions.
Warning	Less tolerable stimulation.

c) If **burst (train of pulses) stimulation** is used, there is an alternating of moments of pause in which stimulation is not produced (see Fig. 5.1), thus reducing the probability that there will be a natural drop in response to the stimulation itself, with a consequent need to increase its intensity ([4]). The technique can be used in combination with conventional TENS or electro-acupuncture TENS.

Fig.5.1- Characteristics of Tens current

5.3 - Positioning the electrodes

Correct **positioning of the electrodes** is essential to the success of this therapy, while their polarity is not especially important, since the TENS current generated by Pocket is two-phase.

Though optimal points vary from patient to patient, the electrodes can be applied:

– **locally**, comprised within the painful zone, or they can be positioned one directly on the trigger point and the other in the near vicinity;

– **laterally to spine** (usually the positive electrode), at the level in the vertebrae where the nerve serving the painful area enters, and the other electrode (usually the negative) at a location where the pain tends to be contained between the two electrodes.

Traditional TENS requires a local electrodes positioning, so that the painful area is crossed by the electrical field; while in **electro-acupuncture TENS** the points to be stimulated coincide as a rule with the motor points and the acupuncture points.

5.4 - Clinical applications

TENS is applicable in various **pathological situations which produce pain**, especially problems of the **articular and muscle apparatus** (for example cervical pains and cervicobrachial pathologies). Notable success has been obtained thanks to its non-invasive characteristics, its ease of application and its practicability even at home by the patient him or herself, who must undergo a short training to be able to use the apparatus correctly. The treatment presents no particular side-effects, except for a local sense of vibration or paresthesia (tingling, a hot sensation) in the zone where the electrode is applied. In the following table some examples of electrode application are given, but in all cases of successful treatment with TENS the electrodes are positioned so as to comprise the painful zone within their span. The figures are contained in the coloured sheets of the enclosed application manual.

PATHOLOGY	POSITION OF ELECTRODES
Trigeminal neuralgia	Apply two electrodes on the forehead in positions 1-2,1-3,1-4 on the picture, depending on the place of pain. Keep the electrodes at least 3 cm away from the eye bulb.
Cervicalgia	For **localised pain** apply two electrodes on the interested part. For **diffused pain** apply four electrodes, two on each side of the spine (channel 1 and 2 with crossed polarities)**.**
Cervico-brachialgia	Apply the electrodes on the back of the shoulder, one in the cervical area, or on the trapezius muscle, the other on the painful point.
Scapulohumeral periarthritis	Apply two electrodes, one above and the other on the side of the shoulder.
Epicondilitis	Apply one electrode on the elbow joint and the other on the base of the neck on the same side, or else both electrodes on the elbow.
Lumbalgia	Apply four electrodes to the sides of the rachis (channels 1-2 with inverted poles), or, in one-side treatment, just two electrodes close to each other.
Lumbo-ischialgia	Apply one electrode at the level of the abdominal vertebrae and the other at the buttock, the thigh or the leg, depending on the farthest point where pain is felt.
Gonalgia	Apply two electrodes to the sides of the knee (channel 1), if necessary adding two more electrodes above and below the knee cap (channel 2).
Achilles tenonitis	Apply two electrodes on the tendon to comprise the painful area.
Carpal Tunnel	Apply two electrodes one to the wrist or the hand and the other on the inner forearm, so as to cover the painful area.
Sprain	Apply two electrodes to the painful side of the heel, so as to cover the painful area.

5.5 - Pre-set protocols

The URO model includes the TENS for uro-gynaecological treatments with probe (*) and the conventional TENS for analgesic treatments with electrodes (**). The models PRO, REHAB and IONOTENS have several protocols for the traditional TENS, the electro-acupuncture TENS, the specific TENS for individual kinds of pain. The protocols are shown on the following tables:

URO PROTOCOLS		
Program	**Description**	**Indications**
AC.PELV.PAIN*	Sharp pain in the pelvic area	Conventional TENS: Ton = 50μs – Burst operation - Duration 20 min
CHR.PELV.P.*	Chronic pain in the pelvic area	Conventional TENS: Ton = 50μs – Burst operation - Duration 20 min
ABDOM. PAIN**	Abdominal pain of various kinds	Conventional TENS: Ton = 70μs – Continuous operation - 30 min
MENST.PAIN**	Menstrual or similar pain in the belly	Conventional TENS: Ton = 70μs – Continuous operation - 30 min

PRO / REHAB / IONOTENS PROTOCOLS		
CONVENTIONAL TENS		
Program	**Description**	**Indications**
ANALGESIC L.1	Conventional TENS: Ton = 50μs - Duration 30 min	High sensitivity patients.
ANALGESIC L.2	Conventional TENS: Ton = 100μs - Duration 30 min	Low sensitivity patients.
TENS BURST	Conventional TENS: Burst operation - Duration 30 min	Patients who adapt quickly to the stimulation.

ENDORPHIN TENS		
Program	**Indications**	**Description**
ENDORPHIN.	Electric acupuncture TENS Duration 20 min	Indicated for patients affected by chronic pain syndrome.
END. BURST L.1	Electric acupuncture TENS – sf = 3Hz Burst operation - Duration 20 min	Patients who adapt quickly to the stimulation
END. BURST L.2	Electric acupuncture TENS – sf = 5Hz Burst operation - Duration 20 min	Same effects as in previous protocol, but more tolerable.

SPECIFIC PROTOCOLS		
Program	**Indications**	**Description**
CERVICAL	Neck pain and headache	**Conventional TENS:** Ton = 100μs Continuous operation Frequency 80-140 Hz (different depending on the protocol) Duration 30 min
CERV.BRAC.	Diffuse pain from the neck to the shoulder	
PERIARTHRI.	Articular shoulder pain	
BACK PAIN	Back pain	
LUMBAGO	Lumbar and sciatic pain	
EPICONDYL.	Swelling on outside elbow	
CARP.TUNN.	Tenonitis of the wrist and/or forearm	
ABDOM.PAIN	Abdominal pain	
HIP PAIN	Hip pain	
ADDUC.PAIN	Groin swelling	
GONALGIA	Knee joint pain	
KNEE SPRAIN	Knee sprain	
PERIOSTIT.	Tibia pain	
ANKLE SPR.	Heel sprain (sharp/chronic)	
METATARS.	Pain on the back of the foot	
FOOT TEND.	Swelling of the plantar fascia of the foot	
BRUISE	Bruise pain	
MUS.CONTR.	Muscle contractures	
STRAINING	Muscle strains	
BIG STRAIN	Muscle rents	
TENDONITIS	Every kind of tendon swelling	
ACUTE PAIN	Every kind of acute pain	
CHRON.PAIN	Every kind of chronic pain	

5.6 - Setting a free protocol

In FREE protocols, it is the user who sets the parameters according to his or needs. With TENS current, the following parameters can be set:

PARAMETER	MEANING	RANGE
Ton	Duration of the impulse	**50, 70, 100, 150, 200, 250** μs.
Sf	Frequency of stimulation	**1 → 200 Hz.**
Ts	Stimulation time	**CNT** (continuous operation) **1 → 10 s** (burst operation).
Tp	Pause time (1)	**1 → 10 s.**
Rise	Up rise (1)	MED (medium), VEL (fast)
Time	Duration of the therapy	**1 → 60 min** for each phase.
Stop	Stop = YES the phase stops before the next phase starts	**YES / NO.**

Note (1): if the value of the parameter **Ts** has been set at "**CNT",** the TENS current will be delivered in continuous operation, i.e. sf is issued for the whole duration (Time) of the program (see Fig. 5.1). The parameters **Tp** and **Rise** appear on the display with the value "-" and cannot be changed.

Chap.6 - DIADYNAMIC CURRENTS
(programs covered by CE0476 certification)

Symbol on the display: (in PRO model only)

6.1 - Analgesic action

The term diadynamic, or Bernard currents ([4]), is used to indicate a group of unidirectional, single-phase, low frequency pulses derived from the rectification and superpositioning of sinusoid currents. Apart from trophic and reabsorption effects on oedemas and bruises, they also possess an analgesic property due to the reduction in sensitive nerve excitability at the positive pole. The most used forms of diadynamic pulses are listed below and are already contained in the following Pocket Pro pre-set programs:

- **fixed single-phase** (**MF**),
- **interrupted single-phase** (**PS**),
- **fixed two-phase current** (**DF**),
- **interrupted two-phase** (**RS**),
- **short-period current** (**CP**)

Other combinations can be set using the Pocket free programs, as specified in the section on "Operation".

⚠: Diadynamic currents are single-phase and the continuous component may cause reddening or burns if not correctly applied.

6.2 - How to apply the electrodes

The **electrodes**, generally made of conductive silicone and housed in **water-soaked sponge envelopes** are positioned in the zone of treatment, or along the pathway of the afferent nerve, and are fastened using elastic straps, to guarantee uniform pressure and avoid current concentrations which might be dangerous.

ATTENTION: the **fixed two-phase (DF)** and **short term (CP)** diadynamic currents use **one channel only** (Channel 1).

They are located as follows ([1]):

a) the live electrode (**negative**) at the zone **where the greatest pain is experienced**, and the other electrode (**positive**) in the zone the pain spreads to;
b) the electrodes **along the afferent nerve pathway** (which delivers the painful impulses).

⚠: Avoid diadynamic application in zones where the user **has metal prostheses and osteosynthetic implants**, as the currents used are single-phase ([1]).

⚠: Use correct size of electrode for the painful area [4], but never smaller than those supplied with the apparatus, and never bigger than the sponge envelopes used; an electrode which is only partly enveloped could touch the skin.

6.3 - Clinical applications

Diadynamic currents are indicated for treatment of relatively superficial and localised pathologies, such as elbow or knee **tenonitis**, **painful after-effects of articular trauma, acute and chronic arthropathy, muscular pains** ([7]), **cervical and back pain, neuralgia, myalgia, moderately poor venous circulation** in the lower limbs ([8]). The intensity of stimulation should be regulated to produce in the patient a tingling sensation either around

the stimulating electrode only, the (-), or both. The table below gives some examples of electrode application ([4]) for diadynamic currents. The "reference figures" are contained in the enclosed manual.

PATHOLOGY	POSITION OF ELECTRODES
Cervicalgia	For paravertebral pain the two electrodes are fixed at the sides of the rachis.
Cervico-brachialgia	The live electrode is placed on the nape of the concerned side and the other electrode is place on the shoulder.
Scapulohumeral periarthritis	For trans-articular therapy fix the two electrodes on the front and back of the shoulder.
Lumbalgia	The two electrodes are positioned on the sides of the rachis, with the live one on the painful side.

6.4 - Pre-set protocols

Pocket Pro has 5 pre-set protocols for diadynamic currents, both direct and by train of pulses, which are both indicated on the display under the title "diadynamic".

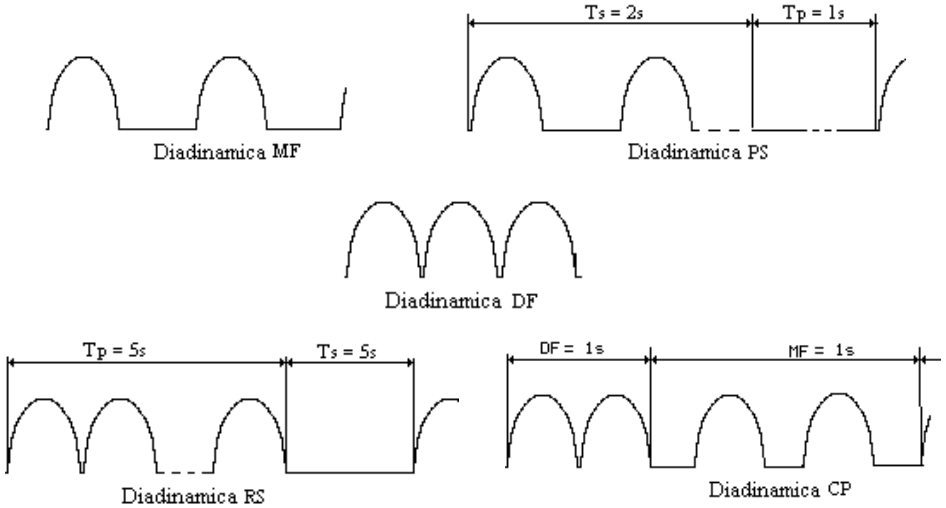


***Fig. 0.2**– The Diadynamic current protocols*

PRESET PROTOCOLS WITH DIADYNAMIC CURRENTS		
Program	**Description of program**	**Indications**
DIADYN. MF	Diadynamic MF – 20 min	Indicated for treatment of chronic pain (slow but lasting analgesic effect).
DIADYN. PS	Diadynamic MF interrupted with Ts and Tp=2s - 20 min	Strong stimulating effect on striated muscle ([4]).
DIADYN. DF	Diadynamic DF - 20 min	Indicated for treatment of acute pains.
DIADYN. RS	Diadynamic DF interrupted with Ts=5s and Tp=5s - 20 min	Decided anti-inflammatory and anti-spasm effect on muscles
DIADYN. CP	Alternating supply of DF for 1s and MF for 1s then again DF – 20 min	Trophic action indicated in presence of articular trauma with oedema ([4]).

6.4.1 - Setting a free protocol

As illustrated in the section on "Operating", FREE programs can be created, in which the parameter setting is determined by the user according to needs. For diadynamic currents, in the **FREE menu (Lib)**, the parameters shown in the table below can be set in each of the six available phases.

PARAMETER	MEANING	RANGE
sf	Frequency of stimulation	**50 Hz (MF) / 100 Hz (DF)**
Ts	Stimulation time (1)	**CNT** (continuous operation) **1 → 10 s** (burst operation)
fp	Pause frequency	**0, 50, 100 Hz (**can be modified only in burst operation).
Tp	Pause time (2)	**1 → 10 s**
Base	Direct current superimposed on diadynamic, can be used only in Ch 1 (3)	**YES / NO**
Rise	Up and down duration of the intensity	**MED (medium), VEL (fast)**
Time	Duration of treatment	**1 → 60 min** for each phase
Stop	Stop = YES (SI) interruption of phase before start of next phase	**YES/ NO**

Notes:

(1) If parameter **Ts** has been set to "**CNT",** the diadynamic current is supplied in continuous operation and MF (sf=50Hz) or DF(sf=100Hz) currents cannot be supplied as they are interrupted, as is RS.

(2) If Ts = "CNT", the Tp parameter is shown on the display with the "-" value, but it cannot be changed.

(3) If Base setting is "YES (SI)" a **direct current** is superimposed on the diadynamic current when treatment has begun, and its level can be adjusted during treatment between 0 and 10 mA using the buttons +/- of Channel 2; in this case, the diadynamic current can only be used on Channel 1 with fp=50 Hz.

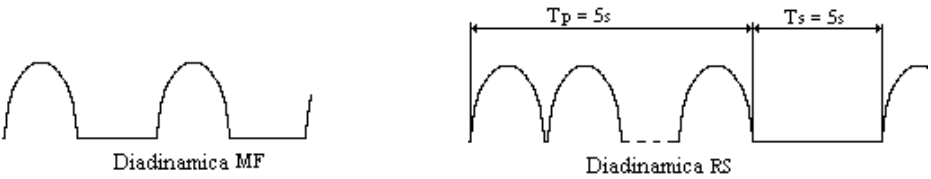


Fig. 0.3 – Example of MF Diadynamic current (F.Stim=50Hz and T.Stim.=CNT) and RS (sf=100Hz, Ts=5s and Tp=5s)

Chap.7 - BIPOLAR INTERFERENTIAL CURRENT

(programs covered by CE0476 certification)

Symbol on the display: **(only on the PRO model)**

7.1 - Analgesic action

Interferential bipolar current is a medium-frequency alternating sinusoidal current (2.5KHz), modulated in amplitude, characterised by its high penetrability of tissues and its excellent tolerability even for particularly sensitive patients. The analgesic action of the bipolar interferential current, with modulation frequency between 50 and 100 Hz, is attributed to the gate control mechanism, stimulation of the inhibitory mechanism, peripheral blocking of pain transmission, removal of algogenic substances from the painful area, as already seen with TENS current ([4]). By varying the frequency of modulation used, an **excitomotor effect** can also be exploited (modulation between 1 and 10 Hz), which contributes, activating the "muscle pump", to blood return flow.

7.2 - How to apply the electrodes

Guidelines for **application of the electrodes** are the same as those for TENS.

7.3 - Clinical applications

Bipolar interferential current is especially recommended for **arthrosis** of the deep joints **(hip, lumbar rachis)**, deep **tendinopath**y and **muscular hypotrophy** in normoinnervated and deep muscles**; e**xamples of bipolar interferential application are as for TENS ([4]).

7.4 - Pre-set protocols

Two bipolar interferential current protocols are available with Pocket Pro:

PROTOCOLS WITH BIPOLAR INTERFERENTIAL CURRENT		
Program	**Description of program**	**Indications**
EXCIT.SCAN	Automatic fm scanning from 2Hz to 20Hz – fm change every 10s – duration 20 min	Strong excitomotor effect. Recommended for activating "muscle pump" and enhancing blood flow return.
ANALG.SCAN	Automatic fm scanning from 60Hz to 100Hz - fm change every 10s – duration 20 min	Strong analgesic effect.

7.5 Setting a free protocol

The parameters which can be set for bipolar interferential current are shown on the following table:

PARAMETER	MEANING	RANGE
Scan	Manual or automatic variation in modulation frequency.	**YES (SI) → NO.**
fm	Modulation frequency	**2 → 20 Hz** with variations 2Hz /step. **20 → 200 Hz** with variations 20Hz /step.
sf1 (1)	Minimum frequency (2)	**2 → 20 Hz** with variations 2Hz /step **20 → 180 Hz** with variations 20Hz /step
sf2 (1)	Maximum frequency (2)	**4 → 20 Hz** with variations 2Hz /step **20 → 200 Hz** with variations 20Hz /step
Time	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = Yes (SI) interruption of phase before start of next phase.	**YES (SI) / NO.**

Notes:

(1) If the **Scan** parameter value is "**YES (SI)",** the stimulation program automatically varies the modulation frequency between a start value **sf1** and a final value **sf2 to be set manually**.

(2) The value sf1 must always be less than sf2; you cannot set an equal or greater value.

Chap.8 - DIRECT CURRENT

(programs covered by CE0476 certification)

Symbol on the display: ⎓ (in the PRO and IONOTENS models)

8.1 - Analgesic action

Direct current is used in **ionophoresis** treatments, in cases of **rheumatic pathologie**s and – as **galvanization** - in **rheumatic pathologies** and **muscular hypotrophy.**

8.1.1 - Ionophoresis

The **ionophoresis** method is used to spread ionised **medication** in the tissues, passing through the cutaneous barrier by application of direct current. The medications used (on which the therapeutic effect depends) can be ionised in water solution and, while soluble medications can be applied directly on the sponge envelopes, freeze-dried ones have first to be diluted in distilled water before being applied on the sponge. Before starting it is essential to know the **right concentration** and the **polarity of the medication** itself, so that it can be applied on the **electrode with the same polarity**, unless it is amphoteric. Also, a too-high concentration might lead to skin irritation, while a too-weak concentration lead to a preponderance of parasite ions deposited on the skin or the sponge if not meticulously cleaned.

8.1.2 - Galvanization

Galvanisation adopts for therapeutic purposes the trophic and analgesic effects of direct current on biological tissues. The **trophic effects** are encountered at the **negative electrode**, and are linked with blood flow, removal of catabolytes, increased oxygen, nutrition and white corpuscle supply to the tissue. The **analgesic effects** are felt at the **positive pole**, and are due to both the hyper-polarisation of the cell membranes, which obstructs conduction of pain messages, and also to vaso-dilation, which aids removal of algogenic substances.

8.2 - How to apply the electrodes

ATTENTION: direct current calls for the use of **one channel only** (Channel 1).

8.2.1 - Ionophoresis

First the electrodes must be correctly packed in the medication-soaked sponges, as illustrated in the section on Operation. Then they can be applied as follows:

a) the **transversal technique**, in which they are located opposite each other at a joint;
b) the **longitudinal technique**, where the electrodes are in proximal and distal positions on a limb.

8.2.2 - Galvanization

The electrodes can be applied using the following methods ([7]):

a) The **longitudinal method**, with one electrode at the end of a limb and the other applied on the cervical or lumbar rachis, so that the electric flow can pass between the two through the tissues. If the positive electrode is placed on the rachis and the negative electrode on the distal end of the limb (**descending longitudinal galvanisation**) a **trophic effect** is obtained, while if the positive electrode is placed at the distal end of the limb and the negative electrode on the rachis, an **analgesic effect** is obtained (**ascending longitudinal galvanisation**);

b) The **transversal method**, with the electrodes placed on the opposite surfaces of a joint, for an analgesic effect.

8.3 - Clinical applications

8.3.1 - Ionophoresis

The effect of ionophoresis treatment is strictly linked with the type of medication applied, the effective quantity which actually passes through the skin, influenced by current intensity, the duration of the application, the concentration of the solution and the electrode surface size. The applications, used in various medical fields, are indicated in the treatment of pathologies which **involve non-deep structures without large-scale muscular and fatty tissue covering**, such as the **elbow, the hand, the wrist, the knee, the shoulder, the cervical zone and the tibia-tarsus** ([7], [1]) obtaining, according to the medication used, an analgesic, anti-inflammatory, anti-oedema or myo-relaxant effect. The following table lists some medications used in ionophoresis applications, with relative pharmacological actions and clinical indications.

Medication	Pole	Pharmacological action	Indications
Calcium chloride (Sol 1%;2%)	Positive	Sedative and calcifying action	Osteoporosis, Spasmophilia, Algo-dystrophic spasmophilia **PROHIBITED** for arteriosclerosis
Potassium Iodide	Negative	Sclerolytic and emollient action	Scars, adherences, Dupuytren's Disease, Keloids
Lysin Acetylsalycilate	Negative	Anti-inflammatory and analgesic action	Arthrosis
Benzidamine	Positive	Anti-inflammatory and analgesic action	Rheumatoid arthritis
Sodium dichlophene	Negative/ Positive	Anti-inflammatory and analgesic action	Contusions
Piroxicam	Positive	Anti-inflammatory and analgesic action	Sprains
Sodium silicate (1%-3%)	Negative	Analgesic action	Articular rheumatism, acute decongesting, Acute myalgia
Ketoprophene lysin salt	Negative/positive	Anti-inflammatory	Arthrosis, Arthritis
Thiomucase	Negative	Anti-oedema action	Post-traumatic oedema, post-surgery trauma and poor circulation

8.3.2 - Galvanization

Although its use over the last few years has been limited due to the introduction of other therapies, galvanisation is still applied thanks to its analgesic effects in treatment of **neuralgia, diffused arthralgia, brachialgia and lumbo-ischialgia**, whereas its trophic effect is used in cases of **muscular hypotrophy and traumatic after-effects** ([1], [7]).
In the table below some examples of electrode application are given ([4]) for ionophoresis and galvanotherapy. The photos of the applications are contained in the coloured sheets in the enclosed manual.

PATHOLOGY	POSITION OF ELECTRODES
Epicondilytis	Transversal method with electrodes applied to sides of the joint.
Cervicalgia	Transversal method with electrodes applied to the base of the nape.
Gonalgia	Transversal method with electrodes applied to sides of the joint.
Lumbago	Transversal method with electrodes applied to sides of the joint.
Lumbo-ischialgia	Longitudinal method with one electrode applied paravertebrally and the other at the buttock, the thigh or the leg, depending on the spread of the painful irradiation. The electrode polarity depends on the type of application.

8.4 - Pre-set protocols

The **Pro** and **IonoTens** models have 4 protocols available for the application of direct current:

PROTOCOLS WITH BIPOLAR INTERFERENTIAL CURRENT		
Program	**Description of program**	**Indications**
IONOPHOR. L.1	Direct current – duration 10 min	Acute inflammation in sensitive areas (e.g. the hand)
IONOPHOR. L.2	Direct current – duration 20 min	Acute inflammation
IONOPHOR. L.3	Direct current – duration 30 min	Chronic inflammation
HYPERIDROS	Direct current – duration 20 min	Hyperidrose treatment

8.5 - Setting a free protocol

The following parameters must be set for a free protocol:

PARAMETER	MEANING	RANGE
InvP	Polarity reversal during stimulation, without changing its position (Note 1).	**YES (SI) → NO.**
Time	Duration of the treatment	**1 → 30 min** for each phase.
Stop	Stop = Yes (SI) interruption of phase before start of next phase.	**YES (SI) / NO.**

Notes:

(1) If the value of the parameter **Inv.Pol.** is "**YES" (SI),** the stimulation program will reverse the polarity of the electrodes applied at mid program, without modifying the position.

Chap.9 - TWO-PHASE RECTANGULAR CURRENT

Symbol on the display:  **(in the PRO, REHAB and URO models)**

9.1 - Excitomotor action

Two-phase rectangular current consists of a positive rectangular micro-pulse, immediately followed by another, identical in intensity and duration, but opposite in pole, in order to prevent ionisation of the tissues. The micro-pulses are delivered in packets (see Fig. 9.1), in which the changes in distance between two successive pulses (contraction frequency **fc**), in height (intensity of current **I**) and duration of pulse (**Ton**) affect the excitomotor effect.

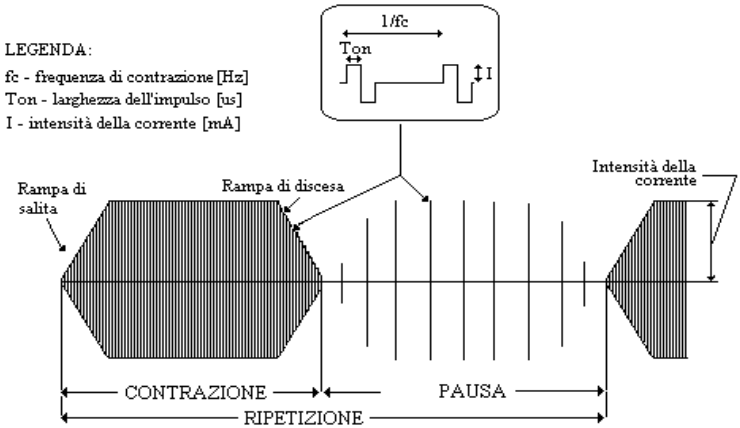


Fig. 0.4 – Stimulation protocol for two-phase rectangular current with burst operation, i.e. with a pause duration different from zero (see section 9.5).

9.2 - How to apply the electrodes

Electrodes are applied using the:

- **bipolar method** *(for medium- to small-sized muscles)*, using two electrodes applied so as to include the muscle to undergo contraction treatment within the electric field generated by them ([8],[11]).
- **tripolar method** *for average-to-large muscles)*, with three electrodes applied (one negative and two positive) applied so as to include the different parts of the muscle to undergo contraction treatment within the electric field generated by them ([8],[11]).

9.3 - Positioning the electrodes

The reference figures showing how to position the electrodes are contained in the colour manual for the applications enclosed with the device.

9.4 - Clinical applications

During **rehabilitation**, two-phase rectangular current is usually used to enhance functional recovery of **the normoinnervated muscles (tonotrophism).** For **training purposes** ([8]), using the pre-set or the free programs, with a special programming of the electrical settings for contractile stimulation such as contraction frequency, pulse duration and intensity, the different types of fibre can be selectively stimulated, varying training type and improving muscle performance.

9.5 - Pre-set protocols

In the **Pro** and **Rehab** models, the two-phase rectangular current has various protocols for muscular stimulation, which are designed for muscle recovery and strengthening after trauma. In the **Uro** model, however, the rectangular current is used with specific protocols for stimulating the muscles of the uro-gynaecological apparatus. The following table lists the programs, with relative indications of use.

PRO / REHAB Protocols	
Program	**Description of protocol**
WARM UP	**Warming up muscles in lower and upper limbs and trunk** Prepares the muscles for a more intense muscle stimulation session.
WIND-DOWN	**Winding down muscles in lower and upper limbs and trunk** Reduces onset of contraction, soreness and lactic acid.
CAPILLAR.	**Capillarization of lower and upper limbs and trunk** Increases blood supply and warms up muscles**.**
REHAB	**Functional recovery of lower and upper limbs and trunk - Levels 1 and 2** **For use in the post-traumatic phases (usually two to three weeks)** to recover muscular activity gradually. Starting at level 1 and passing on to level 2 (increase in frequency of contraction) and finally passing on to a Tone program.
TONING	**Muscle tone for lower and upper limbs and trunk.** Used to recover good muscle tone on normoinnervated muscles after trauma; working under weightlessness condition.
STRENGTH	**Strength for lower and upper limbs and trunk.** Develops **muscular strength after full recovery of functions**.

Note: The selection menu allows you to choose the name of the program together with the muscle group area the electrodes are to be applied on (the part of the human figure on right which is flashing) and the stimulation level (if present).

URO Protocols		
Program	**Parameters**	**Description**
URO SENS.	Burst operation – Ton 250 – Frequency 50 Hz – Duration 10 min	Proprioceptive perineal stimulation
URO SPEC.	Burst operation – Ton 250 – Frequency 20 Hz – Duration 10 min	Specific perineal stimulation
URO REFLEX	Burst operation – Ton 300 – Frequency 32 Hz – Duration 20 min	Treatment of spastic incontinence – Antagonist inhibiting action
URO STRESS L.1	Burst operation – Ton 250 – Frequency 50 Hz – Duration 15 min	Treatment of incontinence due to effort – Reinforcing action on the pelvic floor
URO STRESS L.2	Burst operation – Ton 300 – Frequency 50 Hz – Duration 20 min	
URO STRESS L.3	Burst operation – Ton 250 – Frequency 35 Hz – Duration 10 min	
URO STRESS L.4	Burst operation – Ton 300 – Frequency 75 Hz – Duration 15 min	
URO MIX L.1	Burst operation – Ton 250 – Frequency 5-10 Hz – Duration 10 min	Treatment of mixed incontinence – Double action: reinforcement of the pelvic floor and inhibition of the detrusor
URO MIX L.2	Burst operation – Ton 300 – Frequency 10-35 Hz – Duration 20 min	
URO MIX L.3	Burst operation – Ton 300 – Frequency 5-35 Hz – Duration 20 min	
URO MIX L.4	Burst operation – Ton 300 – Frequency 1-35 Hz – Duration 20 min	
URO URGEN. L.1	Burst operation – Ton 150 – Frequency 5 Hz – Duration 15 min	Treatment of urgency incontinence - inhibition of the detrusor
URO URGEN. L.2	Burst operation – Ton 350 – Frequency 5 Hz – Duration 15 min	
URO URGEN. L.3	Burst operation – Ton 150 – Frequency 10 Hz – Duration 15 min	
URO URGEN. L.4	Burst operation – Ton 300 – Frequency 10 Hz – Duration 25 min	
VAGIN.STIM	Continuous operation – Ton 250 – Frequency 1 Hz – Duration 10 min	Treatment of vaginism – Decontracturing and relaxing action

Note: in every program and level, the times of action and pause vary (sec).

9.6 - Setting a free protocol

Settings for two-phase rectangular current are given in the table below.

PARAMETER	MEANING	RANGE
T on	Duration of pulse	**100, 150, 200, 250, 300, 350, 400 μs.**
f.Contr.	Frequency of contraction	**1 → 130 Hz.**
T.Contr.	Duration of contraction (Note 1)	**"CNT"** (continuous operation). **1 → 8 s** (burst operation).
f.Pause	Frequency of pause	**0 → 6 s (**modifiable only in burst operation).
T.Pause	Pause time	**1 → 30 s (**modifiable only in burst operation).
Rise	Rise (2)	**LEN (slow), MED (medium), VEL (fast)**
Timer	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES / NO.**

Notes:

(1) If the **T.Contr.** setting has been set to "**CNT",** two-phase rectangular current is supplied continuously, i.e. **F.Contr.** continues throughout the duration (**Time**) of the program (see Fig. 9.2). The parameters **T.Pause** and **Rise** are shown on the display at level "-", but cannot be changed in continuous operation.

(2) The rise (and descent) ramp is the time during which the intensity set on the muscle contraction rises.

Fig. 9.2 – Rectangular current in action-pause burst operation (T.Contr. different from "CNT") or in continuous operation (T.Contr. = "CNT")

Chap.10 - KOTZ CURRENT

Symbol on the display: **(on the PRO and REHAB models)**

10.1 - Excitomotor action

Devised in the 1970s by a Russian doctor by the name of Kotz, this is a sinusoidal current with a medium frequency (2500Hz), modulated in 10ms-duration packets followed by pauses of the same duration (see figure 10.1). The packets are in turn modulated to generate a muscle CONTRACTION phase and a recovery phase. As with all medium-frequency currents, it is characterised by considerable ease of penetration and is at times preferred to low-frequency currents (two-phase rectangular and faradic) to stimulate the deeper muscles ([8],[7]).

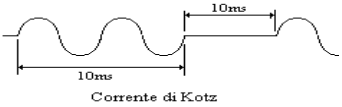


Fig. 0.5

10.2 - How to apply and position the electrodes

The electrode application method is the same as with the two-phase rectangular current. For positioning the electrodes refer to the photos of muscular application.

10.3 - Clinical Applications

Kotz current is used for improving power in normoinnervated muscles in cases of **muscle hypotrophy originating from non-use**, **idiopathic scoliosis and muscle improvement for athletes.** With respect to other low-frequency excitomotor currents (two-phase rectangular and faradic), it gives greater muscle recruitment (best of all in frequencies of between 2500 and 5000 Hz) and a deeper action, as the skin offers less resistance to these frequencies. The disadvantage is the difficulty of stimulating specific muscle fibres, as can be done with two-phase rectangular current.

10.4 - Pre-set protocols

Program	Description
TONING	For developing muscle tone
STRENGTH	For producing an increase in strength, interesting all muscle fibres (slow, medium and fast), with special effectiveness on deep muscles.

10.5 - Setting the parameters of free protocols

The parameters that be set with Kotz currents are shown in the following table.

PARAMETER	MEANING	RANGE
Tc	Duration of contraction	**2 → 10 s.**
Tp	Pause time	**5 → 32 s**.
Rise	Rise	**LEN (slow), MED (medium), VEL (fast)**
Time	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES / NO.**

Chap.11 - FARADIC CURRENT

Symbol on the display: (in the PRO and REHAB models)

11.1 - Excitomotor action

This is a low-frequency current, consisting of a series of 1 ms triangular pulses with rise time (Ts in Fig. 11.1) equal to descent time (Td in Fig. 11.1), unidirectional and uncompensated. The biological effects, linked to the pulse frequency, are represented by the **excitomotor action** of the normoinnervated muscles ([7]) and by vaso-dilation through action on the nervous fibres of the sympathetic nervous system ([7]).

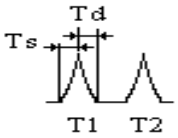


Fig. 0.6 Corrente faradica

11.2 - How to apply and position the electrodes

The electrodes can be applied in the same way as in the **bipolar** and **tripolar** methods, described above in the chapter on two-phase rectangular current; positioning of the electrodes is also the same (muscular applications).

11.3 - Clinical applications

Faradic current is used to induce contraction in normoinnervated muscles, especially in cases of muscular **hypotrophy and hypotony due to non-use** (cases where a patient is unable to voluntarily move his or her muscles due to collaboration deficit or to suppression of motor functions ([7],[8]), **centrally-originating flaccid paralysis** in those muscles which in the hemiplegic stay flaccid for weeks after the cerebral ictus ([7]), hysterical-type **functional paralysis, muscle transplant,** in order to give adequate trophism to the transplanted muscle ([7], [4]).

11.4 - Pre-set protocols

Pocket **PRO** and **REHAB** have two protocols available for applying faradic current:

FARADIC CURRENT PROTOCOLS		
Program	**Description of program**	**Indications**
MOTOREXCIT	Short pulses – Frequency 50 Hz	Normoinnervated muscle stimulation
VASODILAT.	Short pulses – Frequency 100 Hz	Vasodilatant and hyper-haematizing effect

11.5 - Setting a free protocol

The parameters that can be set for faradic current are shown in the following table:

PARAMETER	MEANING	RANGE
fc	Frequency of contraction	**1 → 100 Hz**
Tc	Duration of contraction (Note 1)	**"CNT"** ((continuous operation) **1 → 8 s** (burst operation)
Tp	Pause time	**1 → 32 s** (modifiable only in burst operation)
Rise	Rise and descent	**LEN (slow), MED (medium), VEL (fast)**
Time	Duration of treatment	**1 → 60 min** for each phase
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES / NO.**

Note:

(1) If the **T.Contr.** parameter has been set to "**CNT",** faradic current is supplied continuously, i.e. **F.Contr.** continues throughout the duration (**Time**) of the program (see Fig.11.2). Parameters **T.Pause** and **Rise** are shown on the display at level "-", but cannot be changed, as they are meaningless in continuous operation.

Fig. 0.7 – Faradic current in burst operation (T.Contr. different from "CNT") and in continuous operation (T.Contr. = "CNT)

Chap.12 - SINGLE-PHASE RECTANGULAR CURRENT

Symbol on the display: ⌐¬ (only in PRO model)

12.1 - Excitomotor action

Single-phase alternating rectangular current is characterised by a single rectangular pulse, which varies rapidly from zero to maximum amplitude, by a duration of contraction, Tc, equal to the duration of the pulse, and by a pause time Tp, equal to the time allowed for muscle recovery. The rectangular shape of the pulse is responsible for muscle contraction, the special duration of the pulse determines a selective contraction of the denervated fibres and the null average value of the pulses prevents any ionisation of the skin.

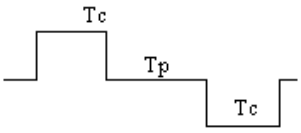


Fig. 0.8 Rettangolare monofasica

12.2 - How to apply the electrodes

The electrodes can be applied following the **bipolar** technique, for small-sized muscles, and the **tripolar** technique for larger muscles, already described in the chapter regarding two-phase rectangular current.

12.3 - Clinical applications

Alternating rectangular current is used to **stimulate totally denervated muscles**, although often it is preferred to apply triangular, or exponential pulses which disturb the patient less and afford greater selectivity in stimulation of only denervated fibres ([7], [4]), especially in cases of not-total denervation. The following table gives some examples of nerve lesions for which alternating rectangular current can be used.

LESIONS OF PLEXUS BRACHIALIS (Erb and Klumpke paralysis)		
Muscles involved	**Recommended method**	**Notes**
Deltoid	Bipolar	Muscles involved in Klumpke paralysis (lower type) ([4]).
Biceps and Brachial	Bipolar	
LESIONS OF SCIATIC POPLITIEAL NERVE (SPE)		
Peroneal	Bipolar	
Anterior tibial	Bipolar	
SCIATIC LESIONS		
Biceps of thigh	Bipolar	

12.4 - Pre-set protocols

Pocket Pro has three protocols available for applying single-phase alternating rectangular current. They are shown on the following table:

PROTOCOLS WITH SINGLE-PHASE ALTERNATING RECTANGULAR CURRENT		
Program	**Description of program**	**Indications**
DENERV.RM L.1	Pulse duration 50 ms – Pause 1 sec – Program duration 8 minutes	Not very denervated muscles
DENERV.RM L.2	Pulse duration 100 ms - Pause 1 sec – Program duration 10 minutes	Partly denervated muscles
DENERV.RM L.3	Pulse duration 200 ms - Pause 1 sec – Program duration 12 minutes	Very denervated muscles

12.5 Setting a free protocol

The parameters which may be set with alternating rectangular currents are shown in the following table:

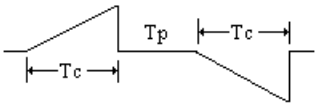
PARAMETER	MEANING	RANGE
Tc	Duration of contraction	**25 50 75 100 200 300 400 500 600 700 800 900 1000 ms.**
Tp	Pause time	**1 → 10 s.**
Time	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES (SI) / NO**

Chap.13 - TRIANGULAR CURRENT

Symbol on the display: (only in PRO model)

13.1 - Excitomotor action

Triangular current reaches its highest value with a linear rise which, in connection with quite long-duration pulses (Tc), elicits a valid contraction response in the denervated fibres without stimulating the normoinnervated adjacent fibres. Naturally, as this is an excitomotor current, the triangular pulse of duration (Tc), responsible for the contraction of the denervated fibres, is followed by a pause period (Tp), in which the current is nil. The pulses are alternated so as to avoid any ionisation of the skin.



Corrente triangolare

Fig. 0.1

13.2 - How to apply the electrodes

The electrodes can be applied following the **bipolar** methods for small-sized muscles and **tripolar** for larger muscles, previously described in the part above on two-phase rectangular current.

13.3 - Clinical applications

For its ability to accommodate nerve fibres to the slow growth in intensity of stimulation and for the absence of discomfort to patients, triangular current is used to stimulate **totally and partially denervated muscles**. The selective stimulation of the fibres does not involve normoinnervated muscles, a problem which sometimes occurs with alternating rectangular current due to the fast pulse rise ([7]). Examples of application are reported in the previous section concerning alternating rectangular current.

13.4 - Pre-set protocols

Pocket Pro has three protocols available for applying triangular current:

PROTOCOLS WITH TRIANGULAR CURRENT		
Program	**Description of program**	**Indications**
DENERV.TR L.1	Pulse duration 200 µs – Pause 1 sec – Program duration 10 minutes	Not very denervated muscles
DENERV.TR L.2	Pulse duration 400 µs - Pause 2 sec – Program duration 12 minutes	Partly denervated muscles
DENERV.TR L.3	Pulse duration 800 µs - Pause 3 sec – Program duration 15 minutes	Very denervated muscles

13.5 - Setting a free protocol

The parameters which may be set with triangular currents are shown in the following table:

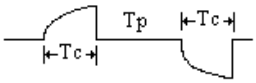
PARAMETER	MEANING	RANGE
T.Contr.	Duration of contraction	**2 4 8 10 25 50 100 200 400 600 800 1000 ms.**
T.Pause	Pause time	**1 → 10 s**.
Time	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES (SI) / NO.**

Chap.14 - EXPONENTIAL CURRENT

Symbol on the display:  **(in the PRO and REHAB models)**

14.1 - Excitomotor action

Exponential current reaches its highest value with an exponential rise which, in connection with quite long-duration pulses (Tc), elicits a valid contraction response in the denervated fibres without stimulating the normoinnervated adjacent fibres. Naturally, as this is an excitomotor current, the exponential pulse of duration (Tc), responsible for the contraction of the denervated fibres, is followed by a pause period (Tp), in which the current is nil. The pulses are alternated so as to avoid any ionisation of the skin.



Corrente esponenziale

Fig. 0.2

14.2 - How to apply the electrodes

The electrodes can be applied following the **monopolar** methods for small-sized muscles and **bipolar** for larger muscles, previously described in the section 7.3 concerning two-phase rectangular current.

14.3 - Clinical applications

Exponential current, due to its ability to accommodate the nerve fibres to the slow rise in intensity and thus not create any patient discomfort, is used to **stimulate totally denervated and partially denervated muscles**, as it is able to selectively stimulate the denervated fibres without causing any response in the normoinnervated fibres, a problem which sometimes arises with alternating rectangular current due to the rapid pulse rise ([7]). Examples of clinical applications are the same as those mentioned in the chapter on alternating rectangular current.

14.4 - Pre-set protocols

Pocket PRO and REHAB have 4 programs available for applying exponential current. They are shown on the following table:

EXPONENTIAL CURRENT PROGRAMS		
Program	**Description of program**	**Indications**
DENERV. M.	Pulse duration 250 ms – Pause 1 sec – Program duration 10 minutes	Generally denervated muscles
DENERV.EXP L.1	Pulse duration 100 µs – Pause 1 sec – Program duration 10 minutes	Not very denervated muscles
DENERV. EXP L.2	Pulse duration 200 µs - Pause 1 sec – Program duration 12 minutes	Partly denervated muscles
DENERV. EXP L.3	Pulse duration 500 µs - Pause 2 sec – Program duration 15 minutes	Very denervated muscles

14.5 - Setting the parameters of free protocols

The parameters which may be set with exponential current are shown in the following table:

PARAMETER	MEANING	RANGE
Tc	Duration of contraction	**2 4 8 10 25 50 100 200 400 600 800 1000 ms.**
Tp	Pause time	**1 → 10 s**.
Time	Duration of treatment	**1 → 60 min** for each phase.
Stop	Stop = YES (SI) interruption of phase before start of next phase.	**YES (SI)/ NO**

Chap.15 - POWER SUPPLY

15.1 - How to use battery/power supply

Pocket can be supplied both by mains voltage at 230V~ 50Hz, through the external power supply which is provided together with the device (see the section on Technical Specifications), and by a rechargeable internal Ni-Mh 6V-1.7 Ah battery which, under normal conditions of use, can last several hours. The autonomy of the battery depends on the type of programs used, on the intensity of the current set and on the age of the battery itself.

⚠ In order to identify the battery and the power supply which are provided together with the device, see the chapter on "Technical Specifications". Neither the power supply nor the battery must be replaced by people who are not experts, and especially they must not be replaced with any device different from those provided by the manufacturer.

15.1.1 - Indication of the state of the battery

When Pocket is supplied by the inside battery, the BATTERY symbol will appear on the display.

Legend:

- battery charged
- battery run out

When the battery run out sign appears, you **should recharge the battery completely.** To protect the battery Pocket is provided with a **self-turning off system** which turns the device off when the battery has run out completely (a few minutes after the battery run out symbol starts to flash).

⚠ The BATTERY symbol appears only when the device is disconnected from the power mains, otherwise the MAINS symbol will appear.

15.1.2 - Recharging the battery

To recharge the battery of the Pocket:

1- **turn off** Pocket;

2- **take off the cables** from the device and put the electrodes back in place;

3- **connect the power supply** to the power mains and to the Pocket;

4- **leave the device to charge** (the display will show the symbol of the battery filling and emptying) **until the symbol of the battery is filled** (a complete recharging cycle lasts about **3 hours)**; when the battery has been charged, it is not necessary to disconnect the power supply immediately (it can even stay connected all night long);

5- **disconnect the power supply** from the power mains and from Pocket.

ATTENTION: when the battery has completely run out (e.g. when the device has not been used for a long time), the display may not light up at once when the recharging starts. In this case, leave it charging and then check after a few minutes whether the flashing battery symbol has appeared.

15.1.3 - Suggestions on how to preserve the battery

The lifetime of a rechargeable battery depends on the number of charging/discharging cycles it has gone through, and on how these cycles are performed. Following is some advice on how to prolong the life of the battery:

1. if you **do not use** Pocket frequently, **charge the battery at least once a month**.
2. To extend the life of the battery we suggest you **recharge it only when the run out battery symbol flashes**.
3. You should work **connected to the power mains** whenever possible, in order not to submit the attery to unnecessary charging/discharging cycles.

15.2 - Replacing the battery

The criterion for the lifetime of the battery is its duration after a complete recharging cycle. When the battery lasts **less than one hour and does not allow you to complete a program** it must be replaced with a new one. To replace the battery refer to an **Service Centre**, which can replace the battery while maintaining the safety of the device and disposing of the used battery.

⚠ Never reverse the polarity of the battery connections, otherwise you will destroy the electronic circuits.

15.3 - Precautions to take when using the battery

(1) Never throw the old battery out with ordinary waste; give it to authorized personnel so they can dispose of it.
(2) Do not open the battery and do not throw it into the fire.
(3) Do not short circuit the terminals.
(4) Do not let sparks or flames come above or near the battery.
(5) Should the inside electrolyte touch the skin or clothes, wash immediately with water.
(6) Should the inside electrolyte touch the eyes, wash with a lot of water and call a doctor immediately.

Chap.16 - MAINTENANCE

If you want the device to work properly and safely, even a long time after the purchase date, you must carry out the following **routine maintenance operations**.

16.1 - Cleaning and maintaining the applied parts

16.1.1 Maintenance of pre-gelled electrodes

To preserve the gel layer of the electrodes:

(1) after each use, apply a small quantity of water on the adhesive gel, letting it dry in the air for a few second, before putting it back on the silicon support;
(2) close the envelope containing the electrodes carefully, so they do not dry out;
(3) keep the electrodes at room temperature.

It is important to remember that:

1. the duration of the electrodes depends on their maintenance, on the cleanliness of the skin they are applied to, and on the type and intensity of the current applied;
2. the electrodes must be replaced when they no longer adhere to the skin;
3. they must be applied to perfectly whole skin;
4. you must stop applying the treatment and refer to the doctor in case of allergy or irritation of the skin;
5. the electrodes have been designed for personal use.

16.1.2 - Maintenance of non-pre-gelled electrodes

To preserve the electrode properly you should:

(1) clean the surface of the electrode, after each use, with a 50% solution of water and soap;
(2) disinfect the surface with alcohol if the same electrode is used on different patients;
(3) check the state of wear of the surface of the electrode, at the end of each session of electrostimulation;
(4) replace the electrode, if the surface shows cracks, signs of breakage, even in part, in order to avoid uneven distribution of the current, with a consequent increase in the risk of burns.

16.1.3 - Maintenance of the insulation of the electrode cables

Before every electrostimulation session, you must check the wear of the insulation of the output cables, replacing them with cables of the same kind as were provided with the device, if any signs of wear – such as cuts and/or cracks – should appear on their surface.

16.2 - Cleaning the device and/or the power supply

To clean both the power supply and the device, you should use a damp cloth. **Never, in any case, use fluids, since the device is not protected against their entry (IP20)**. It is good practice to always check the state of wear of the insulation (casing and cables) of the power supply, before connecting the device to the power mains. Should they be damaged, even in part, replace the power supply at once.

16.3 - Immediate maintenance

Immediate maintenance must be carried out by or by staff authorized by if:

(1) the device has been subjected to outside mechanical stress, such as serious falls;
(2) the device has been subjected to heavy overheating, for example if left near an intense heat source;
(3) you suspect that fluids may have penetrated into the device;
(4) the power supply, the casing or any other part of the device is damaged, broken or missing;
(5) the device seems to work differently;
(6) The error message SERVICE appears on the display.

⚠ For purposes of safety, you should not use any accessories (for example electrodes, sponges, handpieces and power supply) different from those provided as basic equipment with the device.

⚠ Maintenance and working control operations, and the checks to make sure the device complies with the EN60601-1 safety standards for medical devices, to be carried out using a secur-tester, must be carried out once a year. The working life of the instrument is guaranteed by the company only if such maintenance is performed regularly.

NOTE: Controls should be performed only by New Age Italia srl, or by the specialized personnel appointed by New Age Italia srl. For maintenance, the device may be sent directly to the company service laboratories, or else sent to the dealer whom it was purchased from.

New Age Italia Service Centre:

New Age Italia srl
Via De Brozzi, 3 - 48022 Lugo (RA)
Tel:+39-0545.32019 - Telefax: +39-0545.369028
Web: www.newageitalia.it - E-mail: info@newageitalia.it

Chap.17 - WARNING NOTES

⚠ Use the device only with electrical equipment which complies with current Safety Standards.

⚠ The device has an IP20 safety class (see the section on "Technical specifications"). It is advisable not to use it in the immediate neighbourhood of fluids, since it is not protected against their entry.

⚠ The device should not be used in the immediate neighbourhood of any cellular phones (keep them at least a few metres away).

⚠ Working near (for example at 1 metre) a short wave or microwave treatment device may produce instability in the stimulator output.

⚠ Do not connect the patient simultaneously to the electrostimulator and to a HF surgical device, in order to avoid danger to the patient and to the same stimulator.

⚠ The device does not generate any electromagnetic fields.

⚠ The faradic, diadynamic (Diad.) currents and the direct current (iono) have a non-nil continuous component.

⚠ The operator should not touch the patient and any live part simultaneously.

⚠ The instrument works according to its specifications if the environment is kept at a temperature between 5°C and 40°C and at a humidity lower than 80%. The same conditions must be kept during transport and storage.

⚠ In case of malfunction or faults, you should send the device only to the manufacturer.

⚠ Never work near flammable substances

⚠ Remember that the use of the same electrodes and the same sponge envelopes, or the same conducting straps, on different patients may lead to cross-infection.

⚠ Never use any accessories other than those provided with the device.

⚠ It is extremely important to advise the patient about the kind of feeling he is expected to perceive during the stimulation, in order to intervene immediately, stopping the stimulation through the controls of the instrument or taking off the electrodes, if the feeling is not the right one.

⚠ Keep out of the range of children.

Chap.18 - TECHNICAL SPECIFICATIONS

18.1 - Power supply specifications

Power supply: Brand. Alpha Elettronica Mod. BE272 -28 in
PRI: 230V~ 50Hz SEC: 12V- 1A 12VA max

Inside power supply: rechargeable battery Ni-MH 6V-1.5Ah

18.2 - Output specifications

The following table lists the main electric specifications of the currents which can be generated by Pocket :

TENS
Imax = 100 mA
F.Stim. = 1-200 Hz
T on = 50, 70, 100, 150, 200, 250µs
Operation: burst /continuous

Diadynamic
Imax = 60 mA
F.Stim. = 50 or 100 Hz

Bipolar interferential
Imax = 80 mA
F.Stim = 2.5 KHz
fm = 2-200 Hz

Ionophoresis
Imax = 20 mA

Rectangular two-phase
Imax = 120 mA
F.Contr. = 1-130 Hz
T on = 100-400 µs
Operation: burst /continuous

Kotz Currents
Imax = 80 mA

Faradic
Imax = 80 mA
F.Contr. = 1-100 Hz
T on = 1ms
Operation: burst /continuous

Alternating rectangular
Imax = 60 mA
T on = 25 ms-1s

Triangular
Imax = 60 mA
T on = 2ms-1s

Exponential
Imax = 60 mA
T on = 2ms-1s

Parameter legend

Imax: this indicates the maximum value of the delivered current, peak or continuous, depending on the type of current.
F.Stim. (F.Contr.): stimulation frequency (F.Stim.) or contraction frequency (F.Contr.) for excitomotor currents.
T on: duration of the stimulation pulse.
Output power: 3.6 W x Channel on 1 KΩ

Output channels: stimulation is delivered on 1 channel only (Channel 1) for Diadynamic currents DF and CP and for Ionophoresis (2 channels for every other current).

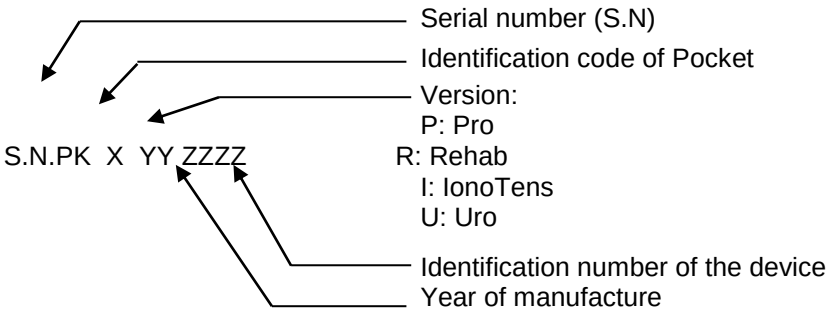
Continuous component: the Faradic (), Diadynamic () and Ionophoresis ()currents have a non-nil continuous component.

18.3 - Other specifications

- Dimensions: 175x105x40h [mm]
- Weight: 400g
- Class: II Type: BF
- Classification for fluid entry: IP20
- Safety in the presence of flammable anaesthetic gas: it does not belong to the AP or APG classes
- Device designed to run: continuously

Built according to the following standards:

- EN 60601-1 (1998): Electromedical equipment: General safety rules
- EN 60601-1-4 (1997): Collateral regulation: Programmable electromedical systems
- EN60601-2-10 (2001) – Electromedical equipment: Special safety regulations for neuromuscular stimulators.
- EN60601-1-2 (1998) – Collateral regulation: Electromagnetic compatibility– Prescriptions and tests
- CEI 62-84 (1997) – Symbols for electromedical devices
- EN60601-1-1 (2002) – Collateral regulation: Safety provisions for electromedical systems



Chap.19 SYMBOLS

CLASS II DEVICE

BF TYPE DEVICE

ATTENTION, REFER TO THE ENCLOSED DOCUMENTATION

THIS DEVICE HAS BEEN CE MARKED ACCORDING TO THE EEC 93/42 DIRECTIVE ON MEDICAL DEVICES UNDER No. MED26017 BY THE NOTIFIED OFFICE No. 0476.

Chap.20 - BASIC EQUIPMENT AND ACCESSORIES

POCKET PHYSIO comes with basic items for the device which are common to all the models, plus additional equipment which are different for each model. The equipment consists of material of various kinds which can be purchased again in case of breakage, loss or use. Besides the equipment which comes with the device, one can also buy other products as accessories, including the *conductive straps for beauty applications, electrodes different from the ones supplied, other splitting cables, etc.

20.1 - Basic Pocket equipment

Equipment common to every model:

No.1 Pocket Unit
No.1 Output cable
No.2 Splitting cables
No.1 Power supply
No.1 Pocket user manual in Italian
No.1 Colour electrode application manual
No.1 Instrument holder bag

Additional equipment (varies depending on the model):

Pre-gelled electrodes 50x50mm and 50x90mm plug
Conductive silicon electrodes (not pre-gelled) 50x50 [mm] and 60x80 [mm]
Sponge envelopes for electrotherapy 50x50 [mm] and 60x80 [mm]
2 Elastic straps 70 [cm]
Anal or vaginal probe (choose when purchasing)

20.2 - Optionals and consumables

Pre-gelled electrodes made of conductive rubber
Gel for Tens treatment, elastic straps and sponge envelopes
Conducting straps for beauty and lymphatic draining
Output and splitting cables (plug and clip), reducers from plug to clip
Anal and vaginal probe
Memory extension up to 30 free programs

Chap.21 – BIBLIOGRAPHY

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