POCKET FAMILY

USER MANUAL

Instructions for use

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ATTENTION:

READ CAREFULLY THIS MANUAL BEFORE USE

Chap.1 - INTRODUCTION

The neuromuscular electrostimulator ‘ Pocket’ can be used to improve muscle performance in both amateur and serious sports, during the various stages of post traumatic rehabilitation to regain muscular tone and trophism, and in analgesic treatment whenever TENS therapy is appropriate. It also offers valid support in esthetic applications helping to eliminate cellulite and favoring fluid drainage.

The typical points of use for sporting applications are gymnasiums and sports centers but it can also be used more generally in any sports venues on the condition that no liquids are allowed to penetrate the device (e.g. rain water). In this context the typical user is an athlete using the device autonomously, but the best possible results are obtained when advice is available form an athletics coach, expert in the use of electrostimulation for training.

Provided with analgesic programs and others that favor functional recovery, Pocket can also be used for physiotherapy, in physiotherapy centers, health structures and in any context of rehabilitation requiring "pain therapy" or post-traumatic muscle recovery.

Finally, it can be used for esthetic purposes to encourage microcirculation and favor the drainage of excess liquids, countering the most common problems of cellulite.
The ease of use of Pocket means that it can be applied at home by the less expert for sporting, therapeutic, or esthetic applications without, however forgetting to consult a doctor beforehand to ensure correct diagnosis whenever electrotherapy is being used as treatment for a pathology.

Pocket Family is available wth the following characteristics:

– **PRESET PROGRAMS** - 194 different protocols for all type of electrostimulation applications. Most programs have specific parameters for the different body parts.

– **FREE PROGRAMS** - 4 setting protocols to customise the parameters and realise a new program in base of the own exigences and goals.

– **POWER** - 120 mA: Pocket Family is very powerful to stimulate big muscles or wide fat surfaces, also with other big accessories such as the conductive bands (not included).

– **POWER SUPPLY** - Double feeding: inner rechargeable battery and power mains (230V).

Chap.2 - SAFETY RULES

2.1 - General rules

Before using the device for the first time, read the Operation Manual carefully. Before connecting the device to a patient for treatment, proceed as follows:

(1) give the device a thorough visual check to see if there are any signs of damage:

(2) take careful note of all the warning stickers applied to the device;

(3) Remove all liquid containers from the vicinity of the device because it has not been provided with protection against infiltration by liquids (IP 20);

(4) Make sure that all the accessories required for stimulation (e.g. electrodes, output cables, etc.) are within easy reach.

2.2 - Counter-indications

Electro-stimulation should not be used:

(1) on pacemaker wearers or patients with cardiac disorders or problems related to irregular heartbeat;

(2) on the front of the throat, in order to avoid provoking laryngeal spasm.

(3) on the sides of the neck, due to the sensitivity of the carotid body;

(4) in the abdominal and sacro-lumbar regions of pregnant women;

(5) in areas with of the skin with open cuts and mucous, alterations of local sensitivity, infection processes, inflammation, phlebitis, trombophlebitis;

(6) whenever electronic equipment (e.g. pacemakers) have been installed in the area immediately beneath the stimulation area;

(7) near the areas to be treated characterised by the presence of metal synthesis and intra-tissue material (such as prostheses, bone synthesis material, spirals, screws, and plaques), especially when using single-phase currents of diadynamic and faradic type and direct currents (for ionophoresis and galvanotherapy);

(8) in areas afflicted by tumours and in the abdominal/lumbar area in the presence of liver or kidney stones;

(9) in areas characterised by dermatitis, cutaneous hypoesthesia, allergies to the substances used during treatment, and thermodynamic pain relied anaesthesia, if ionophoresis is being performed.

(10) Keep the device out of the reach of children.

2.3 - Precautions

We recommend **consulting a physician** and using the electrical stimulator under medical supervision in the following cases:

(1) the utilisation of neuromuscular stimulation for pain relief in patients afflicted by pain syndromes for the identification of the pathological cause, especially when the symptoms fail to recede after a few days of application;

(2) the placement of the electrodes on the face;

(3) near segments to be treated characterised by the presence of metal synthesis and intra-tissue material (such as prostheses, bone synthesis materials, screws, spirals, and plaques);

(4) patients afflicted by epilepsy and Parkinson's disease in which sensitivity thresholds might be altered;

(5) pregnant or possibly pregnant women, when stimulation is provided always and only to the peripheral areas of the body, such as the upper and lower limbs;

(6) placement of the electrodes in areas afflicted by lesions in the tendons and muscles;

(7) patients afflicted by spastic paralysis.

Never place the electrodes:

(1) on the eyeball;

(2) directly on delicate areas, such as the centres of the breasts, the groin, the armpits, or other sensitive areas.

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(3) Never position the heart between the electrode's positive and negative poles – in other words, never place one electrode on the back and the other on the chest near the heart.

(4) Do not use the same electrodes on different persons to avoid the danger of crossed contamination.

2.4 - Special warnings

(1) We discourage using the electrical stimulator after a heavy meal because the shifting of blood to another part of the body might interfere with and lengthen the digestive process.

(2) Whenever during treatment signs of **tachycardia**, **extrasystole**, or **a lack of toleration for stimulation**, appear, suspend treatment immediately for a return to normal.

Chap.3 - PRELIMINARY OPERATIONS

3.1 - Device connection and pre-setting

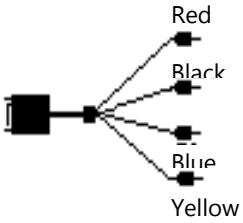
3.1.1 - Power supply connection

pocket can run on either a **rechargeable internal battery** or connected to the **power mains**. In order to connect Pocket to the power mains, insert the plug of the power supply unit positioned at the rear of the device (see Fig. 5 on cover) into the respective socket in the device and then plug the power supply into a power mains socket.

⚠ When Pocket is connected to the electrical mains the ∿ symbol remains on constantly to indicate power present.

3.1.2 - pocket output cable connection

Pocket is equipped with two output channels that can be connected to the parts applied (electrode, conduction straps, etc.) through two output cables. The connection between the output cables and the applied parts is described in Par. 3.2.
As shown in Fig. 3.1, the output cable has four jacks at one end, two per channel. Consult the Table in Fig. 3.1 to correctly identify output jack polarity and the connections to channels 1 or 2.



Colour of jack	Output cable connected channels 1 and 2
Red	+ channel 2
Black	- channel 2
Blue	- channel 1
Yellow	+ channel 1

Fig. 3.1 - Output cable and jack polarity

3.2 - Connection and procedures for applied parts

3.2.1 - Pregelled electrode use (STANDARD EQUIPMENT)

In order to correctly use pregelled electrodes (self-adhesive):

- (1) Thoroughly clean the area of the skin where the electrode will be placed in order to remove all traces of creams or lotions that might impede correct contact with the skin and also irreparably deteriorate the layer of gel present on the electrode.

(2) Connect the electrode to the device's output cable as shown in Fig. 3.2 below;

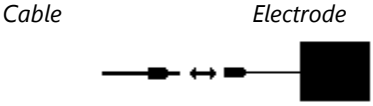


Fig.3.2 - Connection of pregelled electrode – output cable jack

- (3) Remove the electrode from its support by lifting it gently by the flap and being careful not to pull the electrode cable.

(5) Position the electrode on the area to be treated without applying any more gel.

(6) Make sure that the electrode adheres perfectly to the skin and then begin stimulation as described in the chapter entitled ”Operation”.

At the end of treatment :

(1) Switch off the device, disconnect the output cable from the electrode, gently remove the electrode from the skin by raising it up by one flap.

(2) Replace the electrode in the silicone part of the support as described in the chapter “Maintenance”.

3.2.2 - Non-pregelled electrode use (OPTIONAL)

In order to correctly use **conductive silicone electrodes** (**non-pregelled**):

(1) thoroughly clean the area of the skin where the electrode will be placed in order to remove all traces of creams or lotions that might impede correct contact with the skin;

(2) connect the electrode to the device’s output cable as shown in Fig. 3.3 below;

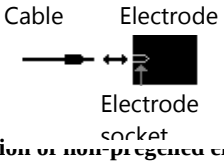


Fig. 3.3 – Connection of non-pregelled electrode – output cable jack

(3) Spread the surfaces of the electrode with the conductive gel required for electrotherapy (**never use any other type of gel than the one supplied with the device).**

(4) Place the electrode on the skin in the area to be treated.

(5) If necessary (depending on the area to be treated) fasten the electrodes to the skin using the elastic straps or non-allergenic adhesive tape applied in crossed swatches over the electrode;

(6) Make sure that the electrode adheres perfectly to the skin and then begin stimulation as described in the chapter entitled ”Operation”.

At the end of treatment :

(1) Switch off the device, disconnect the output cable from the electrode, gently remove the electrode from the skin by raising it up by one flap.

(2) Clean the electrode and remove the gel as described in the chapter “Maintenance”.

(3) Connect the cables to the electrical stimulator as indicated in Par. 3.1.2;

(4) Position the straps in the area to be treated;

(5) Begin stimulation as described in the chapter "Operation".

3.2.3 - At the end of treatment:

(1) Switch off the device and disconnect the output cable from the electrode.

(2) Remove the straps and clean as described in the chapter “Maintenance”.

Chap.4 - OPERATION

4.1 - Control panel

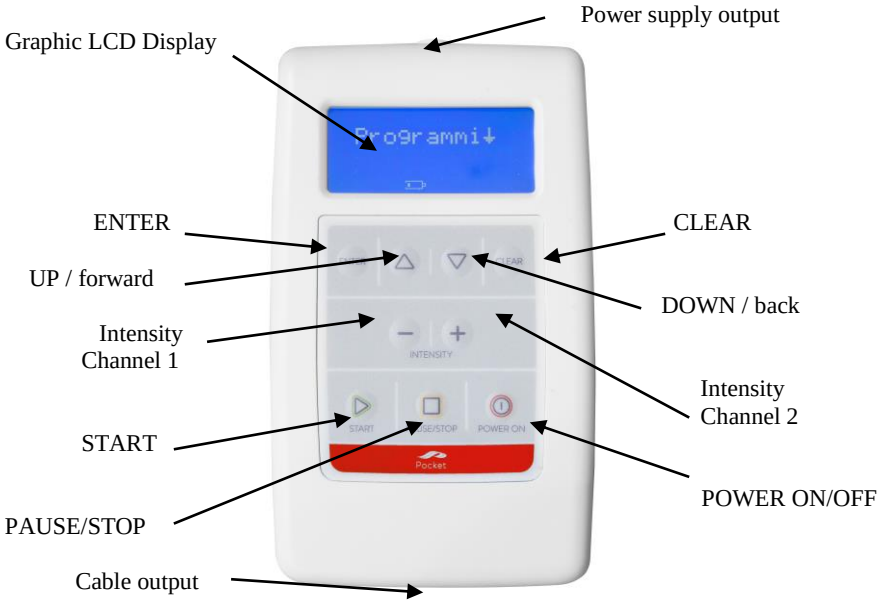


Fig. 4.1 - Pocket control panel: display and keyboard.

4.2 - General instructions for use of menus

Pocket has a display which displays the different option menus. In general when using the menus:

- The *ARROW UP and ARROW DOWN* buttons are used to scroll the different menu options, for example the programs in the program menu.
- The active menu item is the one displayed.
- If the " ▼ " symbol is present alongside a menu item this means that by pressing the *ARROW DOWN* other menu options can be displayed. If the " ▲ " symbol is present the *ARROW UP* button can be used to display other menu options.
- after highlighting the menu item desired, confirm the selection by pressing *ENTER* (see Fig.1 on the cover).

4.3 - Switching on the Pocket

In order to switch on the Pocket, keep the ON/OFF button pressed down until the 'Welcome message' appears on the screen. In order to ensure maximum safety the Pocket runs a self-testing routine whenever it is switched on. If the test is positive ,with all tested parts of the device considered to be intact, a welcome message is displayed. If self-testing reveals a fault a special error message is issued, as illustrated in the "error messages" chapter.

4.4 - Program selection

In the PROGRAM SELECTION menu, users select the preset or free program for use. The **program names** (with diphase Rectangular current: symbol or with TENS current: symbol) are displayed in sequence. The display (Fig.4.2) indicates the program number, the name and the level, and whenever the program is specific to an area of the body, for example "upper limbs", this is indicted by the flashing part of the symbol (Fig.4.3).

Fig. 4.2 - E.g. display showing a program: STRENGTH, lower limbs, level 1.

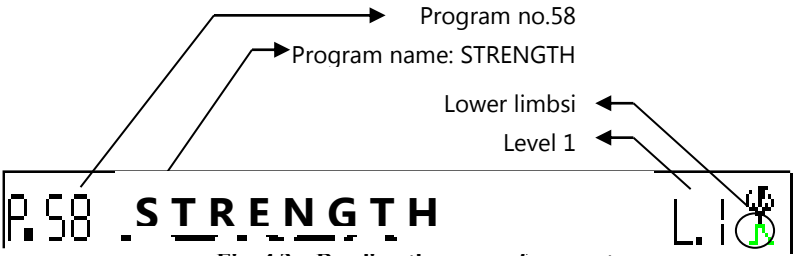


Fig. 4.3 – Reading the name of a preset program

Depending on the program name, all or only some of these symbols are displayed. For example, in the WARM UP program there is no choice of LEVEL of stimulation (see program table Chap.5). If a free program is displayed before being created it appears as in Fig.4.4. If instead the free program already exists its name is displayed.
A program is selected when the "program name" is displayed and then confirmed by ENTER.

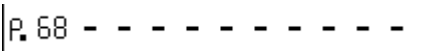


Fig. 4.4 – Free program before creation

4.5 - Starting stimulation

4.5.1 - Setting the contraction warning sound

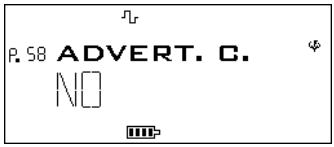
For the MUSCULAR WORK programs that generate the rectangular diphase current, a sound signal can be set to warn users one second before the contraction starts. This is found in the state "contraction warning sound settings" after having **selected** a PRESET protocol from the list of programs or after having chosen the "**Execute**" option for a FREE protocol with ENTER. In this state it is possible to set in sequence:

1- **The contraction warning sound:** when the selected program generates a Rectangular diphase current and it is a muscular work program. If instead a TENS or circulation program is selected (see program table) you pass directly to point 2.

2- The stimulation

The activation of the **contraction warning sound** is achieved by displaying the following screen:

a)



b)

Fig. 4.5 – Activation of the contraction warning sound

To pass from (a) to (b) and back again use +/- of channels 1 and 2. Press "Enter" to confirm the selection made and start stimulation.

4.5.2 - Starting Stimulation

After deciding whether or not to use the contraction warning signal, stimulation can be started by pressing the START button. The screen displays:

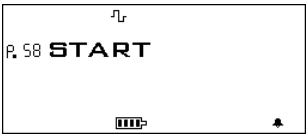


Fig. 4.6 – Begin stimulation? START to continue

4.6 - Setting a free program

When the free program has been selected for setting it is necessary to decide how many phases to set from the 6 available if the free program has not yet been created, or to decide which phases to modify if the free program already exists.

4.7 - Selecting phases to set

There are 6 phases available for setting in each free program and they are displayed on the screen using the ARROW UP and ARROW DOWN buttons.

- To set a phase select it with ENTER when its name is selected on the screen.
- If the phase has not yet been set, when the screen displays, for example, the string "Phase1", with the symbol "--"while if the phase has already been set the word "OK" appears.
- After displaying the 6 phases available, using the ARROW DOWN button the following words are displayed in sequence: "**Execute**", **Save**" and "**Quit**". By confirming the **Execute** string by pressing ENTER the prepared free program is launched. Pressing "**Save**" passes to the program SAVE phase. Choosing "**Quit**", the last option on the display in this state, returns to program selection.

⚠ Le 6 fasi possono essere **impostate** in ordine crescente dalla 1 alla 6. If an attempt is made to set a phase without having set the previous phases, and ERROR is generated (see Error messages)

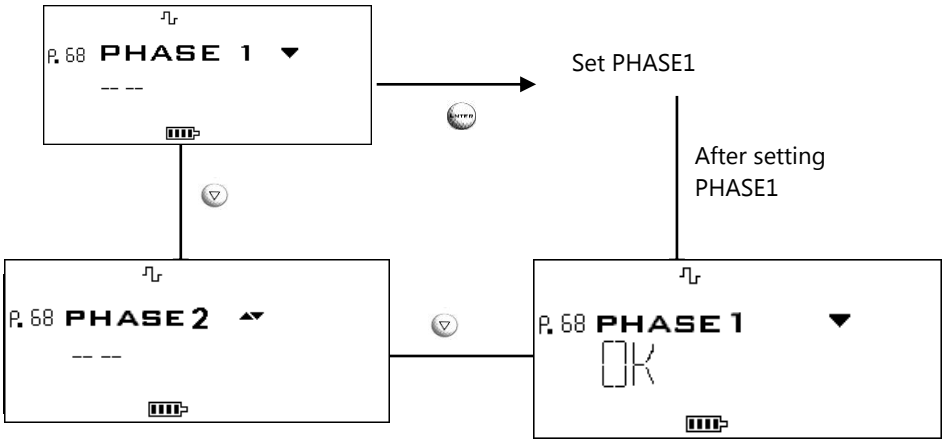


Fig. 4.7- Setting sequence for phase 1

4.7.1 - Saving a free program

The SAVE stage is reached if:

1- A free program is set for the first time.

2- A free program is modified.

In the first case a string will be displayed in this state for a program that has never been set: "-----" with the first "-" character flashing. In the second case the display will show the name of the program prior to modification with the first letter of the name flashing.

To form the name, use the + and - buttons of channels 1 and 2 to select the letters from the available set: "A …. Z, a ….z, 0..9" and the ARROW UP and ARROW DOWN buttons to position the cursor on the letter to be modified. Press ENTER to confirm and save the new or modified program. The system returns to program selection with the name set for the program shown on the display.

4.7.2 - Modifying an existing free program

The only difference between setting a phase for a **new** free program and the **modification** of an existing free program are the figures displayed at the beginning of the setting procedure. In the case of modification the previously saved program parameters are shown.

4.7.3 - Exiting the free program setting procedure

If the phase setting procedure is exited by pressing **Quit,** changes to the free program are not saved. When the system returns to **program selection**, if an exiting free program was being modified, the original name of the program is displayed or, if a new program was being set the string "---------" is displayed.

4.8 - Setting phase parameters

In this state users decide which parameters to set when creating a new free program, or which parameters to modify in an existing free program. Parameters are modified as follows:

- The name of the modifiable parameter is shown on the display (see Chap. 6 – for the list of modifiable parameters).
- The parameter is displayed in three figures under the graphics area (see Fig.4.8) and can be modified with the + and – buttons of the 1 and 2 channels when the parameter name is displayed.
- The displayed figures are the only admitted values for the parameter shown.

- Use ARROW UP and ARROW DOWN buttons to move from one parameter to the next.
- The F. 1 icon indicates that the first of the six available phases is being set.

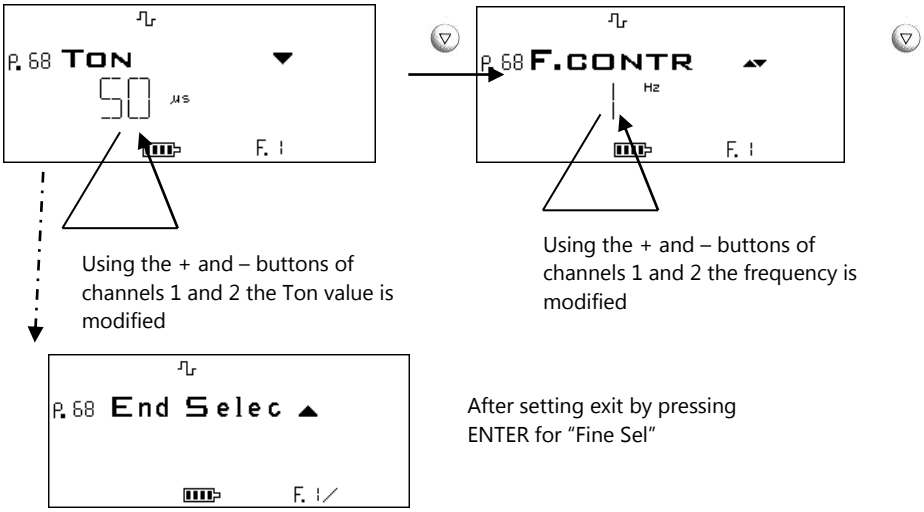


Fig. 4.8 – Free parameters setting sequence

4.8.1 - Completion of the setting of a phase

The last element displayed during parameter setting for a phase is the string "**End Sel**" and confirming this with ENTER exits and saves the new phase settings. While entering phase parameters the CLEAR button is not enabled in order to avoid exiting accidentally before completing the setting of a phase. After exiting from setting a phase, the display shows the phase with "OK" underneath (see Fig. 4.7).

4.9 - Pocket during stimulation

While stimulation is being delivered, the display provides various data depending on the stimulation program set and the setting "Yes" or "No" for the contraction warning sound

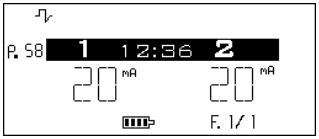


Fig. 4.9: Example of a program that supplies TENS current

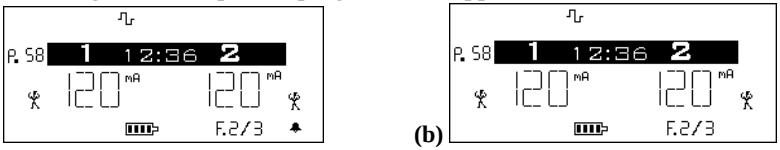


Fig. 4.10: Example of a program that supplies Rectangular diphase current with contraction warning sound (*a*) and without contraction warning sound (*b*).

4.9.1 - The display during stimulation

- **Intensity of stimulation** This is the intensity of current supplied. See following paragraph.
- **Timer** Displays the remaining time for the stimulation session (see Fig.4.6 and Fig.4.7).
- **Contraction symbol** If a muscular work program is selected (see program table Chap.5), Pocket displays the symbol throughout the muscular CONTRACTION (Fig 4.6b), and during the subsequent PAUSE no symbol is displayed.
- **Contraction warning (visual)** If a muscular work program is selected (see program table Chap.5), Pocket displays the symbol one second before the contraction, warning the user that stimulation is imminent.
- **Contraction warning (sound)** If a muscular work program is selected (see program table Chap.5), and if the contraction warning sound is set to Yes, Pocket also displays the symbol, indicating that in addition to the symbol, a sound will be emitted before the arrival of the contraction to warn the user that stimulation is immanent.
- **PHASE indicator** This is a fractional number indicating the current phase of the selected stimulation program. In the example in Fig.4.7 "2/3" indicates that the second of the three phases in the program is underway.

4.9.2 - Adjustment of stimulation intensity

During stimulation, the user can vary current intensity by using the +/- keys corresponding to the channel in use. At the same time the value of intensity set is displayed numerically through the indication of the current in milli-Amperes (mA)
Whenever the rectangular diphase current is used, the user can select programs characterised by CONTINUOUS OPERATION (e.g. programs to improve blood circulation such as "Warm-up" or "Capillarisation"), or programs with BURST OPERATION, which is typical of the muscle work programs (see Programs Tables - Chap. 5). For the former, current intensity adjustment is performed as described in the Paragraph above, while Burst programs, characterised by two distinct phases, one in which the muscle contracts known as "CONTRACTION" and another phase in which the muscle recovers known as "PAUSE", require a different current intensity adjustment system. A different current intensity value can be set for both phases of the Burst program by remembering that:

a) When using the +/- buttons, when the display shows the symbol, the intensity of the current delivered by the device increases during the CONTRACTION phase;

b) When using the +/- buttons, when the display does not show the symbol, the intensity of the current delivered by the device increases during the PAUSE phase;

These two values are liked together at the start of the stimulation session and by setting a current intensity during CONTRACTION of 40 mA, the device will automatically shift the intensity of the current during PAUSE to 20 mA. This ratio is defined as the "**AUTOMATIC**" mode and is maintained by the device until the operator modifies the intensity of the current during PAUSE phase by shifting from "AUTOMATIC" to "**MANUAL**" setting. For example, if the current intensity during PAUSE is shifted from 20 mA to 21 mA, the "AUTOMATIC" ration of the two intensities will be interrupted and during the next CONTRACTION, the intensity will remain at the 40mA intensity of the previous contraction. When shifting from AUTOMATIC to MANUAL mode, the modifications of intensity during any given phase, whether CONTRACTION or PAUSE, will only apply to the phase for which they are performed and not for the subsequent phases.

4.9.3 - Interrupting stimulation (PAUSE/STOP)

The timer counts down until zeroing at the end of the period set for therapy, returning Pocket to selection mode. Stimulation can be temporarily interrupted by pressing the *PAUSE/STOP* button. The state of the device is indicated by the empty stimulation intensity bar, with zero numeric value and time value, which is not counting down but flashing. The maintenance of the residual time allows, when necessary, the subsequent completion of a suspended treatment. Pressing *START* restarts stimulation, while pressing *PAUSE/STOP* a second time returns the device:

- To the current selection menu if the interrupted program is preset.
- To the last setting screen if the interrupted program is a free program, to allow it to be saved if this has not already been done.

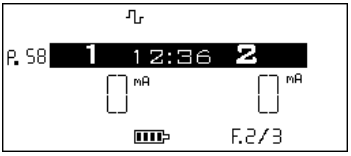


Fig. 4.11: Display in pause state.

4.9.4 - Switching off the device

Press the *OFF* button for a few seconds to shut down operation.

4.10 - User setting

In order to access the setting menu of Pocket, switch on the device by simultaneously pressing the buttons *ON/OFF* and *ARROW UP* (Fig. 1 on cover). The single items in the menu (**contrast, language),** can be selected using *ARROW DOWN*.

4.10.1 - language setting

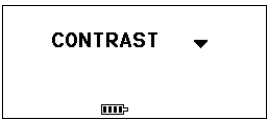
The Pocket user can use the device with the interface menus displayed in Italian, English, French, German or Spanish. In order to select the language to use, select the heading "**Language",** and then confirm with *ENTER* select the language desired in the next menu and then confirm with *ENTER*. The CLEAR button returns to the setting menu in order to quit the menu.

Fig. 4.12: Language setting

4.10.2 - Display contrast setting

Display contrast can be adjusted using the buttons "+" and "–" of channels 1 or 2: the button "–" decreases contrast, while "+" increases contrast.

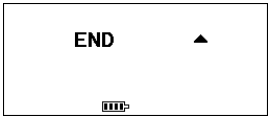
Fig. 4.13: Adjustment of contrast



4.10.3 - Quitting the settings menu

After making all the settings required, selecting the **"Ends"** heading and then pressing *ENTER*, all the modifications made are memorised and the Welcome message shown in Fig. 4.1 appears. The same effect is also obtained by switching off the device with the *ON/OFF* button.

Fig. 4.14: End of setting



4.11 - Error Messages

4.11.1 - Technical servicing required

Whenever the device's self-testing system detects a malfunction that might compromise safety, the "Servicing" message appears on the display for 10 seconds and then the device switches off automatically. In such case, the Pocket must be immediately sent to an authorised servicing laboratory (see "Maintenance").

(a) (b)

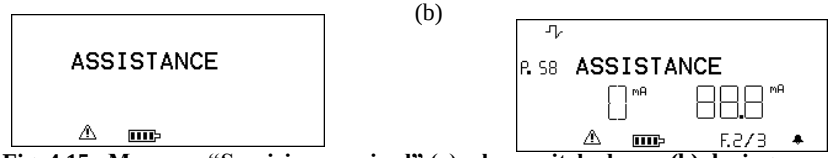


Fig. 4.15– Message: "Servicing required" (a) when switched on – (b) during operation

4.11.2 - Electrodes disconnected message

Whenever one of the electrodes used during stimulation becomes disconnected or adheres imperfectly to the skin, the Electrode disconnected message appears on the display and stimulation is temporarily interrupted, as in the PAUSE state. When the electrode is connected and START pressed, stimulation continues and the error messages disappear from the screen. Stimulation intensity has to be reset. The channel that caused the error will have a flashing "0" figure.

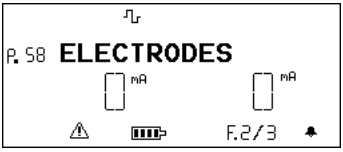


Fig. 4.16: Electrode disconnected message

4.11.3 - Wrong parameter setting message

Whenever unforeseen values or values not congruent with the selections made previously are entered during the setting of the parameters for Free programs, such as, for example, during the setting of a rectangular diphase current an fc value other than 0 is entered after previously selecting continuous simulation with Tc = cont, the error symbol will appear for a few seconds inside the symbol bar to inform the user of the erroneous operation attempted. When the setting procedure has been performed correctly, no error symbols will appear.

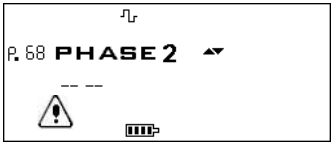


Fig. 4.17: Wrong parameter setting message

4.11.4 - Free program phase setting sequence error message

Whenever the parameters of one phase are entered before those of the previous phase have not stabilised during Free program parameter setting, the error symbol will appear for a few seconds inside the symbol bar to inform the user of the erroneous operation attempted. When the phase setting sequence has been correctly followed, no error symbols will appear.

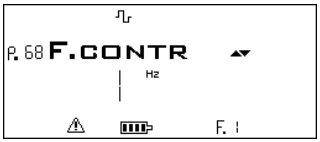


Fig. 4.18: Incorrect phase setting sequence error message

4.11.5 - Free program started before setting error message

Whenever an attempt is made to start a Free program without first correctly setting any phase, the error symbol will appear for a few seconds inside the symbol bar to inform the user of the erroneous operation attempted. When even just one single phase has been correctly set prior to starting stimulation, no error symbols will appear.

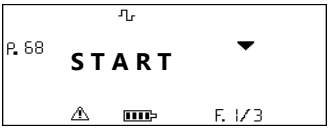


Fig. 4.19: Free program starting error message

Chap.5 - PRESET PROGRAMS

5.1 - List of preset programs

Pocket Family has 194 different pre-set stimulation Programs for Sport (muscle workout and recovery), Aesthetics (beauty treatments) and Therapy (analgesic for pains), listed on next table.

1) **Sport**: programs that supply a rectangular diphase current, generally used for motorial excitation and including programs for **circulation** (warming up, capillary stimulation, and recovery) and specific programs for **muscular work** (strength, tone, impulse strength, aerobics, etc.). They are divided on the basis of area of application (upper limbs, trunk, lower limbs) and level of stimulation required. This allows the programming of electrostimulation training in relation to the level of preparation and required objectives.
2) **Aesthetics**: programs that supply a suitably scaled TENS current for the stimulation of superficial tissues. This favors the drainage of excess fluid, improving local circulation and increasing the number of active capillaries for effective reduction of adipose deposits.
3) **Therapy**: programs that alleviate the most common forms of pain as a result of the transcutaneous electrical stimulation of peripheral nerves, commonly referred to as TENS. This is obtained with extremely short diphase impulses that inhibit the transmission of painful sensations. The raising of pain threshold produced by TENS, prolongs the analgesic effect for a period of time after completion of the treatament.

Table of Pocket Family Programs

PROGRAMS FOR MUSCLE CIRCULATION				
Program No.			**Name and versions of the Program**	**Levels**
1	-	3	Warm up upper limbs, lower limbs and trunk	-
4	-	6	Pre-competition upper limbs, lower limbs and trunk	-
7	-	9	Defatiguing upper limbs, lower limbs and trunk	-
10	-	12	Capillarization upper limbs, lower limbs and trunk	-
13	-	15	Active recovery upper limbs, lower limbs and trunk	
16	-	18	Massage upper limbs, lower limbs and trunk	-
19	-	21	Relaxation upper limbs, lower limbs and trunk	-

PROGRAMS FOR MUSCLE WORKOUT				
Program No.			**Name and versions of the Program**	**Levels**
22	-	30	Aerob. resistance upper limbs, lower limbs and trunk	3
31	-	39	Resistant force upper limbs, lower limbs and trunk	3
40	-	48	Toning upper limbs, lower limbs and trunk	3
49	-	57	Force upper limbs, lower limbs and trunk	3
58	-	66	Explosive force upper limbs, lower limbs and trunk	3
67	-	69	Abdominal development (trunk)	3
70	-	72	Abdominal empowerment (trunk)	3
73	-	75	Abdominal Mass-definition (trunk)	3

SPORTS PROGRAMS				
Program No.			**Name and versions of the Program**	**Levels**
76	-	78	Plain simulation (lower limbs)	3
79	-	81	Mountain simulation (lower limbs)	3
82	-	84	Chronometer simulation (lower limbs)	3
85	-	87	Sprint simulation (lower limbs)	3
88	-	90	Escape simulation (lower limbs)	3
91	-	99	Mass upper limbs, lower limbs and trunk	3
100	-	108	Definition upper limbs, lower limbs and trunk	3
109	-	111	Endurance upper limbs, lower limbs and trunk	-
112	-	114	Half-endurance upper limbs, lower limbs and trunk	-
115	-	117	Fartlek upper limbs, lower limbs and trunk	-
118	-	126	Fast force upper limbs, lower limbs and trunk	3
127	-	135	Fast contractions upper limbs, lower limbs and trunk	3
REHAB PROGRAMS				
Program No.			**Name and versions of the Program**	**Levels**
136	-	138	Stimulation upper limbs, lower limbs and trunk	-
139	-	141	Light workout upper limbs, lower limbs and trunk	-
142	-	144	Heavy workout upper limbs, lower limbs and trunk	-
BEAUTY PROGRAMS				
Program No.			**Name and versions of the Program**	**Levels**
145	-	153	Lipolysis upper limbs, lower limbs and trunk	3
154	-	162	Volume reduction upper, lower limbs and trunk	3
163	-	165	Local thinning upper limbs, lower limbs and trunk	-
166	-	168	Diffuse thinning upper limbs, lower limbs and trunk	-
169	-	171	Localized cellulitis upper, lower limbs and trunk	-
172	-	174	Diffuse cellulitis upper limbs, lower limbs and trunk	-
175	-	177	Local lymphatic draining upper/lower limbs, trunk	-
178	-	180	Diffuse lymphatic draining upper, lower limbs, trunk	-
	181		Face toning	-
	182		Face lifting	-
	183		Face draining	-
ANALGESIC PROGRAMS (TENS)*				
Program No.			**Name of the program**	**Levels**
	184		Cervicalgia *	-
	185		Periarthritis*	-
	186		Lumbago *	-
	187		Epicondylitis *	-
	188		Carpal Tunnel *	-
	189		Gonalgia *	-
	190		Ankle sprain*	-
	191		Strain*	-
	192		Tenonitis*	-
	193		Chronic pain*	-
	194		Sharp pain*	-

*(Programs covered by CE0476 certification)

FREE PROGRAMS				
Program No.			**Name of the program**	**Levels**
195	-	198	Free Programs	-

5.2 - Description of Preset Programs

The following tables describe the various pre-set Programs, subdivided according to the goals they were designed to achieve. The first column shows the name of the Program as it appears on the display together with its duration in minutes, while the right-hand column describes the main features and use.

SPORTS PROGRAMS FOR CIRCULATION	
These programs are composed of sequences with low and constant contraction frequency that permit an increase in blood flow for improved circulation and promote a better warm-up or recovery of muscles after work. The current intensity must be moderate and generally constant. These programs can also be used every day.	
Name on display	**Description of the Program**
Warm-up **5 minutes**	**Muscle warm-up for upper and lower limbs and trunk** To be used prior to each muscle work program to prepare the muscles fore the contractions generated by the various stimulation programs and to permit a session of elevated intensity to be performed without creating any muscular damage.
Winding-down **5 minutes**	**Muscle winding-down for upper and lower limbs and trunk** To be used at the end of an electrical stimulation session or a voluntary training session in order to progressively bring a stressed muscle to rest.
Capillaries **15 minutes**	**Capillarisation for upper and lower limbs and trunk** These programs are used to increase the flow of blood to the muscles and when used regularly to increase capillary capacity and promote the re-absorption of excess liquids. Particularly indicated for those who engage in endurance sports, during preparation for athletic competition and intense physical work-outs.
Active Rec. **10 minutes**	**Active recovery for upper and lower limbs and trunk** Programs to be used at the end of more intense training sessions and for the prevention of the aches and contractions, and the reduction of muscular lactic acid.
Relax **10 minutes**	**Relaxation for upper and lower limbs and trunk** Programs to be used especially at the end of the day for the relaxation of the most contracted muscles after physical activity or prolonged work.
Massage **10 minutes**	**Massage for upper and lower limbs and trunk** Programs to be used anytime during the day to loosen up muscles tired from the training program or aching after work.

MUSCLE WORKOUT PROGRAMS	
These Programs feature a burst operation with different periods of action and pauses (muscle workout and recovery). The most important phase – action – permits the performance of specific muscle contractions to develop tone, force or resistance of the fibres. We suggest 2 to 3 weekly sessions spaced out by 2 to 3 days, to be combined with stretching, articular mobility and agility.	
Name on display	**Description of the Program**
AEROB.RES. **15-40 minutes**	**Aerobic resistance for lower limbs, upper limbs and trunk – Lev.1-3** Light, long duration Programs (low contraction frequencies); they are mainly used to increase the resistance of certain muscles to aerobic work (loose fibres) or else for local thinning.
R.STRENGTH **10-20 minutes**	**Resistant force for lower limbs, upper limbs and trunk – Lev.1-3** Programs which produce medium-long contractions, sufficiently intense with short recovery times in order to stimulate lactic acid metabolism. They are used for muscular definition or to increase the resistance of muscles when lactic acid is present.
TONING **10-18 minutes**	**Toning for lower, upper limbs and trunk - Lev.1-3** Very difficult, short lasting Programs; when used with moderate intensity, they favour the increase of resting muscle tone, whereas working intensively at the limit of tolerance, one can increase muscle force and mass. Short and repeatable Programs (SERIES).
STRENGTH **6-12 minutes**	**Force for lower, upper limbs and trunk – Lev.1-3** Programs with a high contraction frequency. They allow for almost total use of the muscle fibres, enhancing synchronization and development of those parts of the muscle which generally do not share in the contraction. Short and repeatable Programs (SERIES).
E. STRENGTH **5-7 minutes**	**Explosive force for lower limbs, upper limbs and trunk – Lev.1-3** Programs with a very high contraction frequency. These Programs should be reached step by step, starting to work on the lighter Programs (force). They help increase force and contraction speed, or else stimulate large muscle masses which need a higher frequency of impulses in order to contract completely. Short and repeatable Programs (SERIES).
ABDOM.DEV. **ABDOM.STR.** **ABDOM.DEF.** **14-20 minutes**	**Abdominal Development, Empowerment and Definition (trunk)** Increasingly difficult Programs, specific for stimulating the abdominal muscles (high, medium, low, oblique). Through daily use, one can tone, reinforce and develop abdominal muscles in a short time.

⚠: The shorter muscle programs (TONE, STRENGTH, EXPLOSIVE STRENGTH, etc) can be treated as a single sequence and repeated after a recovery time of some minutes. This type of training allows users to structure a personalized training program on the basis of the level of fitness, setting the number of **repetitions (SERIES)**.

SPORT PROGRAMS	
These are differentiated muscle workout Programs, featuring different parameters and phases for specific stimulation of muscle qualities depending on the kind of sport being practiced. We suggest 1-2 sessions per week every 2-3 days and alternating with training.	
CYCLING	
Name on display	**Description of the Program**
PLAIN SIM. **MNT. SIM.** **CHR. SIM.** **SPRINT.SIM** **ESC. SIM.** **40-60 minutes**	**Lap simulation for lower limbs level 1-3** Specific Programs for rounding off preparation on bicycle. They must be used only after achieving a good level of muscle workout Programs. Simulations allow you to carry out sessions resembling actual excursions: on plain with false plains; in the mountains with changing slopes; chronometer with increasing fatigue; final sprint at the end of the route and with repeated escapes during the training session or the competition.
BODY BUILDING	
Name on display	**Description of the Program**
MASS **5-7 minutes**	**Mass for lower limbs, upper limbs and trunk** Intensive Programs for developing muscle volume; to be used at maximum intensity and can be repeated up to 3-4 times (SERIES).
DEFINIT. **4-6 minutes**	**Definition for lower limbs, upper limbs and trunk** Intensive Programs with short breaks in order to obtain muscle stress and hence expand the fibres. To be used intensely at the threshold of tolerance. They can be repeated up to 3-4 times (SERIES).
ENDURANCE	
Name on display	**Description of the Program**
ENDUR. **45 minutes**	**Endurance for lower limbs, upper limbs and trunk** Light Programs with medium-low and rising contraction frequencies in order to stimulate specific muscle resistance. They are used to improve the capacity for working for a long time.
MID DIST. **20 minutes**	**Half-endurance for lower limbs, upper limbs and trunk** Programs of medium difficulty, with growing contraction frequencies in order to stimulate resistance to fatigue. They are used to improve the capacity for producing high intensity for a long time.
FARTLEK **35 minutes**	**Fartlek for lower limbs, upper limbs and trunk** Programs of medium difficulty, with contraction frequencies differentiated in order to stimulate resistance to changes of rhythm. They are used to improve the capacity for tolerating constant changes of difficulty.
SPEED	
Name on display	**Description of the Program**
FAST STR. **6 minutes**	**Fast force for lower limbs, upper limbs and trunk level 1-3** Fast force Programs with sequences of increasing difficulty and fast contractions; they are mainly used to stimulate the force and speed of muscle contractions.
FASTTWITCH **3-5 minutes***	**Fast twitch for lower limbs, upper limbs and trunk level 1-3** Fast force Programs with short and fast contractions; they are mainly used to stimulate the recruitment and speed of muscle contractions.

REHAB PROGRAMS	
These are specific Programs for functional re-education of muscles after an accident. They can be used during the first stage of starting up activity again. Frequent, even daily sessions, are suggested; if possible (without pain) combine with stretching and articular mobility exercises.	
Name on display	**Description of the Program**
MUSC.STIM. **20 minutes**	**Stimulation for lower limbs, upper limbs and trunk** Light Programs (low contraction frequency) to stimulate injured muscles during the first stage of rehabilitation.
LIGHT TR. **15 minutes**	**Light training for lower limbs, upper limbs and trunk** Medium-light Programs (medium-low contraction frequency) to start muscle work during the central stage of rehabilitation.
HEAVY TR. **10 minutes**	**Heavy training for lower limbs, upper limbs and trunk** Medium intensity Programs to reinforce injured muscles before performing more specific workouts.

BEAUTY PROGRAMS	
These Programs produce fat burning muscle stimulation or else surface stimulation on the level of the subcutaneous layer (adipose layer, cellulites, withheld liquids) favouring the release of substances accumulated in the treated area and improving circulation. They can be used every day, and also on several areas of the body.	
Name on display	**Description of the Program**
LIPOLYSIS **20-40 minutes***	**Lipolysis for upper limbs, lower limbs and trunk** Fat burning Programs for women, specifically designed to dry out and model muscles; they are used in combination with thinning Programs in order to increase localized effects.
VOL. RED. **15-20 minutes***	**Volume reduction for upper limbs, lower limbs and trunk** Fat burning Programs for women, having a higher intensity. They are used to obtain greater results in a short time.
LOC. THIN. **DIF. THIN.** **30-45 minutes***	**Local and diffuse thinning for upper limbs, limbs and trunk** Programs for treating adipose layer in men. They melt the subcutaneous layer and put the fat in circulation, so it can later be burned through aerobic activity or other Programs.
LOC. CELL. **DIFF.CELL.** **30-50 minutes***	**Local and diffuse cellulitis for upper, lower limbs and trunk** Programs for treating cellulites. They melt the subcutaneous layer and put the fat in circulation, also freeing the liquids contained inside the cellulitic tissue.
LOC.LYMPH. **DIF. LYMPH.** **20-30 minutes***	**Local and diffuse Lymphatic draining for upper/lower limbs and trunk** Programs for treating water retention. They reactivate closed capillaries and favour the reabsorption of liquids in the lymphatic vases.
FACE TON. **FACE LIFT.** **FACE DR.** **8-15 minutes***	**Toning, Lifting and Draining for the Face** Programs for face treatment: they are used respectively to tone the face muscles, to stimulate them intensively in order to raise the skin, and in order to dry out the more swollen areas.

ANALGESIC PROGRAMS – TENS*	
These are antalgic Programs for treating the most common kinds of pain. They are applied directly on the place where the pain is felt. They must be used every day until the pain disappears and – for especially sharp pains – up to 2 to 3 times a day at intervals of a few hours. **Duration: 30 minutes for all the TENS Programs.**	
Name on display	**Description of the Program**
CERVICAL*	Cervical pains
PERIARTHR.*	Shoulder pains
LUMBAGO*	Lumbar pains
EPICONDYL.*	Elbow pain (tennis player's elbow)
CARP. TUNN.*	Carpal tunnel (hand, wrist or forearm tenonitis)
GONALGIA*	Knee pain
ANKLE SPR.*	Ankle sprains
STRAINING*	Pains due to muscle stretching and strain
TENONITIS*	Tenon inflammation
CHR. PAIN*	General Program for treatment of chronic pain
ACUTE PAIN*	General Program for treatment of acute pain

*(Programs covered by CE0476 certification)

Chap.6 - FREE PROGRAMS

6.1 - Characteristics of stimulation with rectangular diphase current

Rectangular diphase current consists of a rectangular positive micro-impulse immediately followed by another identical in intensity and duration but of the opposite sign to prevent the ionization of tissues. The micro-impulses are delivered in packets, and by varying the distance between successive impulses (contraction frequency **fc**), the height of the impulse (current intensity **I**), or the duration of impulses (**Ton**) it is possible to accurately control the motor excitement effect.

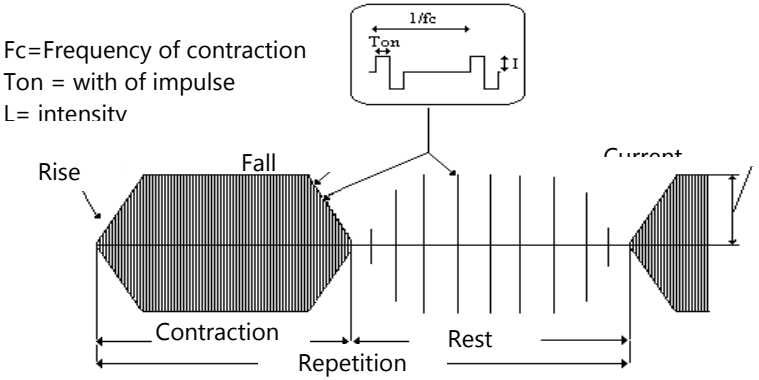


Fig. 6.1 - Stimulation program for rectangular diphase current with burst operation (pulse sequence), that is, with a pause duration greater than zero.

The possible operating modes with rectangular diphase current are:

a) **Burst operation** - in which the supply is in two distinct periods: CONTRACTION and PAUSE.
- CONTRACTION: a sequence of impulses at a higher frequency responsible for the tetanigenous contraction of muscular fiber.
- PAUSE: a sequence of low frequency impulses that favor "muscular recovery" after contraction.

Burst operation is typical of muscular work programs.

b) **Constant operation** – constant supply of micro-impulses at a frequency equal to the contraction frequency (fc) – typical of circulation programs (muscular warm up, fatigue relief, etc.)

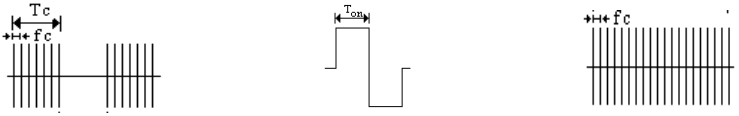


Fig. 6.2 - Burst operation (a) **rectangular diphase (b)** **Constant operation (c)**

6.1.1 - Rectangular diphase: setting a free protocol

If it is necessary to personalize the electrostimulation sessions by creating personalized programs or to combine the training with other methods, a **free program** must be created using the table of references provided in this section to set the parameters for the program. Obviously it is possible to save, cancel, and/or modify a program created, as described in Chap. 4 (Operation).

The stimulation parameters that can be set for the rectangular diphase current in the free protocols are:

PARAMETER	MEANING	RANGE OF VALUES
Ton	Duration of impulse (positive and negative), in microseconds	**100, 150, 200, 250, 300, 350, 400, 450, 500 μs.**
Fc	Contraction frequency, this being number of impulses per second during contraction	**1 → 160 Hz.**
Tc	Contraction duration (Note 1) in seconds	**"cont"** (continuous operation). **1 → 8 s** (burst operation).
Fp	Pause frequency, this being the number of impulses per second during a pause	**0 → 8 Hz** (can only be modified for burst operation).
Tp	Pause time in seconds	**0 → 32 s** (can only be modified for burst operation).
Rs	Rate of increase	**slow / medium / fast**
Timer	Duration of therapy	**1 → 60 min** for each phase.
Stop	Stop = YES; interruption of phase before the start of the next phase.	**YES / NO.**

Notes: if the **Tc** parameter is set to "**cont",** the rectangular diphase current is supplied constantly, this meaning that **fc** is emitted for the entire duration (**Timer**) of the program (see Fig. 3.4). The **Tp** and **RS** parameters are displayed with a "-" value, but cannot be altered in continuous operation.

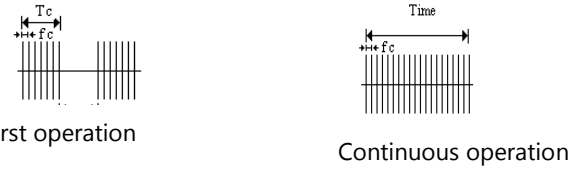


Fig. 6.3 – Rectangular current in burst operation (Tc other than "cont") or in continuous operation (Tc= "cont").

The following table provides guidelines for correctly setting the parameters of free protocols:

DURATION OF IMPULSE (Ton)	STIMULATION AREA
100 - 200	Upper limbs / high sensitivity area
200 - 250	Trunk / high mass upper limbs
250 - 350	High mass trunk / lower limbs
350 - 500	Lower limbs with large mass
CONTRACTION FREQUENCY (fc)	**TYPE OF FIBER STIMULATED**
0 – 10 Hz	Local circulatory effect and massage
10 – 30 Hz	Stimulation of slow fiber
30 – 50 Hz	Stimulation of intermediate and slow fiber
50 – 70 Hz	Stimulation of fast, intermediate, and slow fiber
Above 70 Hz	All fibers with tetanic contractions
DURATION OF CONTRACTION (Tc)	**TYPE OF WORK**
1 – 3 sec	Strength
3 – 4 sec	Tone
4 – 5 sec	Endurance
Above 5 sec	Stamina
PAUSE FREQUENCY (fp)	**EFFECT**
0	Passive recovery
1 – 2 Hz	Relaxing
3 – 4 Hz	Fatigue reduction
5 – 6 Hz	Active recovery
DURATION OF PAUSE (Tp)	**TYPE OF RECOVERY**
Tp = from 0.5 to 1 times the Tc	Incomplete - lactic acid work
Tp = from 1 to 1.5 times the Tc	Short - endurance work
Tp = from 1.5 to 2 times the Tc	Medium - tone and strength work
Tp = from 2 to 3 times the Tc	Complete - impulse strength
RATE OF INCREASE (RS)	TYPE OF CONTRACTION
Slow	Gradual
Medium	Normal
Fast	Fast
DURATION OF PROGRAM (Timer)	**WORK LOAD**
1 – 5 min	Series (for repetitions)
5 – 10 min	Partial – tone / strength work
10 – 20 min	Medium – strength endurance work
20 – 30 min	High – stamina work
30 – 60 min	Very high – only for aerobic stamina work

6.2 - Characteristics of stimulation with TENS current

As illustrated in the POCKET Manual of Use, it is possible to create FREE programs in which the parameters are set according to the user's requirements. In the FREE (Fre) menu it is possible to set the parameters shown in the table below for each of the 6 phases available.

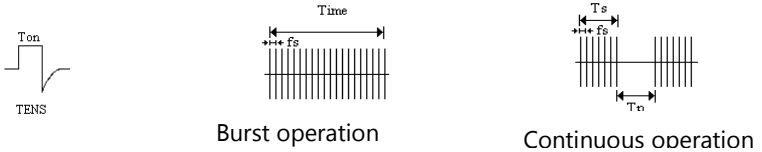


Fig. 6.4- Characteristics of the TENS current

6.2.1 - TENS: setting a free protocol

If it is necessary to personalize the electrostimulation sessions by creating personalized programs or to combine the training with other methods, a **free program** must be created using the table of references provided in this section to set the parameters for the program. Obviously it is possible to save, cancel, and/or modify a program created, as described in Chap. 4 (Operation).

The stimulation parameters that can be set for TENS in the free protocols are:

PARAMETER	MEANING	RANGE OF SETTABLE VALUES
Ton	Duration of the impulse	**50, 100, 150, 200, 250** μs.
fs	Frequency of stimulation	**1 Hz → 200 Hz.**
Ts	Stimulation time	**cont** (continuous operation) **1 → 10 s** (burst operation).
Tp	Pause time (Note 1)	**1 → 10 s.**
RS	Rate of increase (Note 1)	**Slow/ Medium /Fast.**
Timer	Duration of therapy	**1 → 60 min** for each phase.
Stop	Stop = YES; interruption of phase before the start of the next phase.	**YES / NO.**

Notes: if the **Ts** parameter value is set to "**cont",** the TENS current is supplied continuously, which means that fs is emitted for the entire duration (Timer) of the program (see Fig.4.2). The **Tp** and **RS** parameters are displayed as "-", but cannot be modified.

In order to assist the correct setting of parameters some guidelines are given below for the three techniques typically used for TENS in relation to the different effects required:

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

Impulse duration - Ton	**Very short** (30-150 μs).
Impulse frequency – fs	- High (80-140 Hz).
Duration of treatment – Timer	30-60 minutes, extendible ([7]) in the case of short term benefits.
Analgesic effect	Rapid but brief intervention (1-3 hours), limited to the stimulated area.
Intensity of stimulation	To be increased gradually to constantly feel a tingling sensation.
Correct sensation	Light and pleasant tingling.
Precautions	Periodically change the electrode positions during prolonged treatment in order to avoid erythema.

b) **Electro-acupuncture type TENS** by characterized by:

Impulse duration - Ton	**High** (150-250 μs).
Impulse frequency – fs	**Low** (1-5 Hz).
Duration of treatment – Timer	30-40 minutes.
Analgesic effect	Delayed pain relief effect, at least 30 minutes from the end of treatment, but with longer duration than conventional TENS. The effect is the result of the release of endorphin.
Intensity of stimulation	To be increased gradually so that the contraction is always felt.
Correct sensation	Light muscular contractions.
Precautions	Minor stimulation tolerance.

c) If **burst stimulation (pulse sequence)** is applied there is an alteration between stimulation and pause time without stimulation, thus reducing the probability of natural tolerance to the stimulus and consequent need to increase stimulation intensity ([4]). This method can be applied both to conventional TENS and acupuncture-type TENS.

6.2.2 - TENS: setting a free protocol for esthetic treatment

TENS current can also be used to carry out esthetic treatment, adjusting the parameters for a superficial stimulation of the subcutaneous layer (cellulite, fat, and fluid retention).
In order to correctly set the parameters in the free esthetic protocols some guidelines are given below for the creation of effective programs in relation to the areas of the body to be treated and the thickness of the layer to eliminate.

Impulse duration – Ton (varies in relation to thickness)	**150 µs** – up to 2 - 3 centimeters
	200 µs – from 2 - 3 up to 5 centimeters
	250 µs – over 5 centimeters
Impulse frequency – fs (varies according to density)	**20 Hz** – lymphodrainage, fluid retention, swelling
	30 Hz – localized edematous cellulite / localized flaccid fat
	40 Hz – localized flaccid cellulite / localized dense fat
	50 Hz – localized dense cellulite / generalized flaccid fat
	60 Hz – cellulite/widespread and compact fat
Duration of treatment – Timer (varies according to type of treatment)	**20 minutes** – lymphodrainage / fluid retention / swelling.
	30 minutes – cellulite/localized fat
	40 minutes – cellulite/widespread fat
Intensity of stimulation	Constant or gradually increasing so that adequate stimulation is constantly felt.
Correct sensation	Light tingling or vibration.

Chap.7 - SPORT APPLICATIONS

In the treatment of both hypotrophy and muscular strengthening, the more physiological form of voluntary exercise can be combined with **electro-therapeutic treatment** to obtain the **selective contraction of individual muscles** or sections of the same. If muscular fiber is affected by electrical stimulation of appropriate form, intensity, and duration, it reacts producing nervous impulses which, reaching the motor plate, causing contraction. One of the major advantages of electrostimulation with the POCKET, compared with voluntary exercise, is the possibility of achieving the **almost total recruitment of the motor units** available in the absence of inhibiting mechanisms, in **isolation**. This means involving only the muscles where the electrodes are positioned. In addition, with the electrostimulator it is possible to work **without gravitational loading** thus protecting the joints that are often overloaded during voluntary training and also limiting the load on tendons.

The **rectangular diphase** current is particularly suited to motor excitation stimulation because it produces very "clean" muscular contractions (not unpleasant as with other types of current) and it is very versatile because, carefully adjusting the electrical parameters that characterize it (impulse duration, contraction frequency, current intensity) it becomes possible to:

a) Selectively stimulate the different muscle fibers (slow, fast, and intermediate). Each motor unit, according to specific chemical-physical characteristics and the type of work for which it is used (strength, speed, endurance), contracts (tetanizes) with a different contraction frequency.

b) Control the number of recruited fibers: increasing the current intensity increases the number of recruited fibers.

c) Reduce the normal phenomenon of nervous accommodation to the stimulus: the rectangular diphase current is generated in pulse sequences (**burst operation** see Par.3.2), therefore the muscles do not adapt to the impulses and the contractions remain constant.

In any case, it should be born in mind that using electrostimulation for motor excitement there is no equilibrium between agonist and antagonist muscles, nor motor coordination. Therefore a return to sports activity after a period of electrostimulation must include specific voluntary training.

7.1 - Electrode application techniques

The outcome of electrostimulation sessions depends on variable factors other than the selected electrostimulation program and its electrical parameters. These factors include:

a) The positioning of the electrodes responsible for the transmission of the electrical impulses to the muscles to be stimulated in relation to the topographic anatomy of the subject.

b) How the electrical impulses are transmitted by all the filtering bodies between the electrodes and the muscles to be stimulated - the skin and the subcutaneous fatty layer.

It is important therefore, after setting the program, to pay special attention to the positioning of the electrodes since the required results depend largely on their correct location. With **electrodes very close together** the effective area of stimulation is superficial since subcutaneous tissues have a lower impedance than bone and fatty tissues. Conversely, **separating the electrodes** creates a wider electrical field and stimulates deeper tissues.

The position of the electrodes in the common applications of electrostimulation for muscles is at the ends of the muscles. The muscle or section of muscle to be stimulated must be encompassed within the electrical field generated by the electrodes, but never include the proximal tendons or bone protuberances near to the area of application. Application methods can be divided into:

– **Bipolar method** *(for medium to small muscles)*, using two electrodes applied so as to include the muscle to be contracted within the electrical field generated between them ([8], [11]);

– **Tripolar method** *(for very large muscles)*, achieved by doubling the positive pole from one of the output channels of the electrostimulator using a special double cable and applying three electrodes for each channel. This allows the creation of a triangular electrical field and providing stimulation for a larger surface (e.g. glutei, quadriceps, abdominals, etc.) ([8], [11]).

7.2 - Positioning the electrodes

The examples of electrodes application for the bipolar and tripolar method on the principal muscle groups are in the center of the manual.

7.3 - Training with electrostimulation

The following paragraphs offer advice on how to optimize the results of electrostimulation for sports training.

7.3.1 - Programming electrostimulation training

It is essential to **program electrostimulation training** over time in order to coordinate electrostimulation sessions with any other training or competitive commitments. A correct training program must also ensure that peak preparation is achieved in the competitive season or, conversely, a simpler regime to maintain fitness during the winter months when it is not always possible to get regular physical exercise.

7.3.2 - Planning weekly sessions

Stimulation programs intensely stimulate the muscles and so sessions must respect **recovery times** and **alternate loading.** The rest time between an electrostimulation session on a muscle area and the next session on the same area starts at 24 hours for aerobic programs, increases to 48 for strength stamina, while tone, strength, impulse strength sessions must be separated by 48 to 72 hours as a minimum. The following table summarizes the number of sessions per week on the basis of the type of program.

ELECTROSTIMULATION PROGRAM	No. OF SESSIONS PER WEEK
Aerobic stamina	3 – 5
Strength stamina	2 – 4
Tone	2 – 3
Strength, impulse strength	1 – 2
Specific Sport Programs*	1 - 2

* To be used only after a training with the general programs.

The **capillary stimulation** and **massage** programs can be used during rest days, the **fatigue reduction** and **active recovery** can be applied whenever considered necessary after training or competition to encourage muscular recovery. In the initial sessions it is advisable to **gradually habituate muscles** to this new training method using light programs like capillary stimulation before stamina, or tone before strength. The following table provides examples of weekly electrostimulation programs based on different objectives.

ELECTROSTIMULATION PROGRAMS						
Objective	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
General fitness	Aerobic stamina	Aerobic stamina	Capillary stimulation	Rest	Aerobic stamina	Aerobic stamina
Aerobic strength	Aerobic stamina	Strength stamina	Aerobic stamina	Rest	Strength stamina	Capillary stimulation
Strength stamina	Tone	Strength stamina	Aerobic stamina	Rest	Strength stamina	Capillary stimulation
Muscular tone	Tone	Rest	Tone	Rest	Tone	Rest
Strength	Strength	Rest	Rest	Strength	Rest	Rest
Impulse strength	Impulse strength	Rest	Rest	Impulse strength	Rest	Rest
Bulk	Strength	Rest	Impulse strength	Rest	Tone	Rest
Definition	Tone	Rest	Strength	Rest	Strength stamina	Rest
Localized slimming	Aerobic stamina	Rest	Strength stamina	Rest	Capillary stimulation	Rest

7.3.3 - Adjusting intensity

Adjusting the intensity is an essential aspect of a successful electrostimulation program, but it differs for the type of program in use: circulation programs or muscular training.

Program type	for **CIRCULATION** (warming up, capillary stimulation, fatigue reduction, active recovery)
Initial intensity	Increase intensity from 0 until a light massage is felt in the muscles

Program type	for **MUSCULAR TRAINING** (aerobics, strength stamina, tone, impulse strength.)
Initial intensity	Increase intensity from 0 until an intense but pleasant contraction is felt of the muscles affected by the electrodes, during the contraction stage (symbol displayed).

After establishing the initial stimulation intensity the subsequent adjustment must be made according to objectives and in particular to the selected program. The follow table summarizes the guidelines for adjusting intensity.

PROGRAM	ADJUSTING INTENSITY	PERCENTAGE INCREASE
Fatigue reduction Active recovery	Constant or slightly decreasing	0 or – 1% every 1-2 minutes
Warm up Capillary stimulation Aerobic stamina	Slightly increasing	+ 1% every 1-2 minutes
Strength stamina	Increasing	+ 1 - 2 % every 5-6 contractions
Tone	Constant increase	+ 1% every 3-4 contractions
Strength	Frequent increase	+ 1% every 2-3 contractions
Impulse strength	Constant increase	+ 1-3% every contractions

7.3.4 - Structuring programs into SEQUENCES

As mentioned earlier, the shorter work programs (STRENGTH STAMINA, TONE, STRENGTH and IMPULSE STRENGTH) can be repeated using them as **sequence reps.** Sessions can be highly personalized with the option of alternating the various work stages to stimulate the different muscles or by inserting specific exercises between sequence reps to immediately transform the effects of the program with voluntary exercises. At the same time, the recovery achieved between one sequence and the next, if suited to the objectives, allows maximum stimulation of muscles in each sequence for the very intense sessions that are necessary to achieve the maximum results. The following table gives a standard number of sequences for a session depending on the electrostimulation programs in use.

Program	Number of sequences	Recovery between sequences
Strength stamina	1 – 2	20-30 minutes
Tone	2 – 4	10-15 minutes
Strength	3 – 6	4-8 minutes
Impulse strength	2 – 4	5-10 minutes

7.3.5 - Position during stimulation

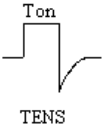
During muscular work programs the ideal position is with the muscle partially extended with the electrodes in full contact with the muscle surface. The position varies according to the type of muscle stimulated. If it is a flexor (e.g. biceps) the body section involved must remain extended. If the muscle is a extensor (e.g. triceps) the body section involved must remain flexed. the stimulation positions must be maintained constant, if necessary using suitable fixtures (e.g. isometric benches) in particular when the work intensity is high and the muscles tend to shorten. In any case it is possible to combine movements with the stimulation always taking the position of the electrodes into account, which in this case must be fitted further inside the area of the muscle to avoid going outside the muscle surface at the position of maximum contraction. The following table lists the main muscles and relative ideal positions.

Muscles stimulated	Position to adopt
Muscles of the upper limbs	
External forearm	Wrist in palmar flexion (holding an object in fist)
Internal forearm	Wrist in dorsal flexion (holding an object in fist)
Biceps	Arm extended
Triceps	Arm flexed
Lateral deltoid	Arm close to body
Anterior and lateral deltoid	Arm close to body to the rear
Trunk muscles	
Greater pectoral (male)	Arm extended outwards and raised
Greater pectoral (female)	Arm extended outwards
External oblique	Bust extended
Medial abdominal	Bust extended
Latissimus dorsi	Arm extended outwards and raised
Upper trapezius	Shoulders lowered
Mid and lower trapezius	Shoulders lowered and forward
Lumbar muscles	Bust extended and slightly flexed
Muscles of the lower limbs	
Peroneal	Ankle flexed inwards
Tibial	Ankle flexed backwards
Ischiocrural	Knee extended
Gluteus	Hip extended or slightly flexed
Quadriceps	Knee flexed
Adductors	Legs apart
Rectus femoris	Knee flexed and ankle extended
Medial and lateral gastrocnemius	Ankle in dorsal flexion with leg extended
Soleus	Ankle in dorsal flexion with leg flexed

Chap.8 - ANALGESIC APPLICATIONS

TENS is the abbreviation for "Transcutaneous electrical nerve stimulation". It produces a selective transcutaneous electrical stimulation of peripheral nerves by means of extremely short diphase impulses. It is believed that the analgesic effect is explained not only by "gate control theory" ([4]), but also by the liberation of endorphins that inhibit the transmission of nociceptive impulses, which are responsible for the transmission of the sensation of pain ([2], [3]). The subsequent raising of the pain threshold means that the analgesic effect persists for some time after the end of treatment and makes it possible to vary the duration of the therapy in each session.

Fig. 8.1



8.1 - Clinical application of TENS

TENS is applicable in the various **pathological situations that produce pain**, in particular in the **articulation and muscular systems** (for example, neck pain and cervicobrachialgia). It is particularly successful as a result of its non invasive nature, easy application, and the fact that it can be applied in a domestic setting by suitably trained patients. The therapy has no particularly unpleasant side effects, causing only a type of local vibration or paresthesia (tingling, feeling of heat) in the electrode application area ([4]).

There are **different techniques** for the application of TENS, associated with different analgesic actions:

- **Conventional TENS**
- **Electro-acupuncture type TENS**
- **Burst stimulation (pulse sequence)**

See Chap 6 for details of the application of this technique to create a free program.

8.2 - Positioning of electrodes

The correct positioning of the electrodes is essential for the success of therapy, while their polarity is not of particular importance because the TENS current generated by POCKET is diphase. While the ideal positions vary from patient to patient, in general the electrodes can be applied ([4]):
- Locally, enclosing the painful area, or one positioned directly on the painful area (**trigger point**) and the other in the immediate vicinity.

- **Laterally to the spinal development** (normally the positive electrode), at the point along the spine where the nervous tract from the painful area enters, and the other (usually the negative) positioned so that the painful area is between the two.

Traditional TENS requires the positioning of the electrodes locally so that the electrical field passes through the painful area, while in **electro-acupuncture type TENS** the stimulation points are often the motor points and acupuncture points.

The following table gives some examples for the application of electrodes. In all cases in which TENS treatment is appropriate, position the electrodes so that the painful area is between them. The reference illustrations are found in the color section in the middle of the manual.

PATHOLOGY	POSITIONING OF ELECTRODES
Neck pain	For generalized pain apply the electrodes to opposite sides of the spine. For pain on one side, apply the electrodes to the side involved. In the latter case use only one channel (2 electrodes).
Cervicobrachialgia	Apply the electrodes to the back of the shoulder, one in the neck area or on the trapezius muscle and the other on the painful area.
Scapula-humeral periarthritis	Apply the electrodes close together encompassing the painful area.
Epicondylitis	Apply one electrode to the trapezius muscle and the other in line with the elbow joint.
Backache	For widespread pain apply the electrodes to the sides of the spinal column. In cases of pain on only one side place them close together on the painful side. In the latter case use only one channel (2 electrodes).
Lumbosciatic neuralgia	Apply one electrode in a paravertebral position and the other aligned with the buttock, thigh, or leg depending on the dispersion of the pain.
Gonalgia	Apply the electrodes to the sides (channel1), or above and below the knee joint (channel 2).
Achilles tendonitis	Apply the electrodes to encompass the painful area.
Sprain	Apply the electrodes on the sides of the sprained area in a longitudinal orientation.
Contusion	Apply the electrodes to the contused area.

It is important to **consult a doctor before treatment** to ensure a correct diagnosis of the pathology subject to TENS treatment. This is particularly important if the symptoms do not subside after a few days of application.

Chap.9 - AESTHETIC APPLICATIONS

The esthetic programs of Pocket supply a TENS current with suitably scaled electrical parameters for the stimulation of superficial tissues and favor the elimination of cellulite deposits. The same principles are also applied for lymphodrainage and for the lipolysis of male adipose tissue. This form of application acts directly on the subcutaneous layer offering more immediate results compared with muscular stimulation.

9.1 - Positioning the electrodes for esthetic applications

The application of the electrodes allows a precise action on the areas in which the adipose tissue or fluid retention is limited and clearly defined. Positioning is directly on the area to be treated and the number of electrodes varies according to the surface to be stimulated. Two electrodes are used for the definition of small superficial areas (arms, hips) and up to six electrodes for the treatment of larger areas of the body (abdomen, buttocks).

The following table gives only a few examples of esthetic applications with electrodes and conductive straps. In general the electrodes are always positioned to encompass the treatment area. The reference illustrations are found in the colour section in the middle of the manual.

TREATMENT AREA	Notes on electrode / band positioning
Inside thigh	Up to 4 electrodes can be used in the same application. according to the extension of the treatment area.
Outside thigh	Up to 4 electrodes can be used in the same application. according to the extension of the treatment area.
Hips	Treatment of the so-called "handles".
Abdomen	If the treatment area is only the central part of the abdomen, 4 small electrodes are sufficient.
Buttocks	Application is the same as for muscular work programs.
Lower buttocks	Application can suit the localization of the layer to be eliminated (including upper or lateral buttock).
Arm	The electrodes can also be applied to other parts of the arm (elbow, forearm, etc.).
Waistline	For widespread cellulite the conductive straps can be used (not included) to treat extended areas.
Thigh circumference	The straps (not included) can be useful for widespread cellulite and for fluid retention (swollen legs), also below the knee.

Chap.10 - POWER SUPPLY

10.1 - Use of battery/power supply

The Pocket can be powered both with power mains voltage 230V~ 50 Hz, through the external power supply provided (see "Technical Features") or using the internal rechargeable Ni-Mh battery (6V-1.8Ah) which under conditions of normal use provide autonomous operation for a few hours. The operational autonomy guaranteed depends on the type of program used and on the state of wear of the battery but under conditions of normal use this can well amount to approx 1 hour.

⚠ In order to correctly identify the battery and the power supply provided as standard equipment, consult "Technical Features". Neither the power supply nor the battery should be replaced by unqualified personnel, nor should any other batteries or power supplys other than those provided by the Manufacturer be used.

10.1.1 - Battery status indication

Whenever the Pocket is being powered by its internal battery, the display's symbol bar will show the following BATTERY " " symbol.

- Battery charged indication

- Battery run-down indication

We recommend recharging the battery as soon as the battery run-down status is indicated. Pocket is equipped with an automatic switch-off system that warns the operator with a warning light and eventually switches off the device if it is not recharged in time.

⚠ The BATTERY symbol appears only after the device has been disconnected form the power mains; otherwise, the MAINS "~" symbol appears.

10.1.2 - Battery recharging

Proceed as follows to recharge the Pocket battery:

1- Make sure that the Pocket has been switched off.
2- Make sure that the device is no longer connected to the patient (the output cables and electrodes must be disconnected).
3- Connect the power supply to the Pocket. After the battery has been recharged, the display shows the image illustrated up. **Leave the device under charge until the display switches off.** When fully charged the battery provides about 10 hours of operation.

After the battery has been recharged, the power supply can be disconnected from the power mains and the Pocket can be used with battery power or switched on and powered from the mains. In this latter case, the battery will remain charged and ready for use the next time that the external power supply is unavailable.

10.1.3 - Suggestions for battery care

The life of a rechargeable battery depends on the number of recharging/rundown cycles it undergoes and how these cycles are performed. We provide the following suggestions for the longer life of the battery:

1. if the Pocket is not used frequently, we recommend to recharg the battery monthly.
2. For longer battery life, we recommend to discharge the battery as much as possible during battery operation.

3. We recommend to use the external power supply whenever work conditions permit it, in order to save the battery.

Note: if the device doesn't turn on, the battery may be too discharged. In this case, if the battery is not damaged, leave the Pocket under charge for 2-3 hours and the disconnect and re-connect the power supply (the display should show "RECHARGE"). If so, leave on charge for at least 8-10 hours; if not, the battery is damaged and must be substituted.

10.2 - Battery replacement

The power remaining in the battery can assessed by its duration after normal recharging has been performed. Whenever the duration of the battery becomes noticeably shorter than when first used, we recommend changing the battery.
Contact an authorised **Servicing Centre** capable of replacing the battery while maintaining the safety of the device and then correctly eliminating the spent battery whenever necessary.

⚠ Never invert the polarity of the battery connections at the risk of destroying the electronic circuits.

10.3 - Battery use precautions

(1) Never throw a spent battery away together with normal waste. Take it to the authorised elimination centre.
(2) Never open the battery or throw it in fire.
(3) Never short-circuit the terminals.
(4) Avoid producing sparks or flames above or near the battery.
(5) Whenever the internal electrolyte comes into contact with the skin or clothing, immediately wash with water.
(6) Whenever the internal electrolyte comes into contact with the eyes, wash with abundant water and contact a physician immediately.

Chap.11 - MAINTENANCE

The **routine maintenance** program below must absolutely be followed to ensure that the device operates adequately and under the conditions of maximum safety even long after the original purchase date.

11.1 - Cleaning and maintenance of the parts applied

11.1.1 - Maintenance of the pre-gelled electrodes

Proceed as follows to ensure ideal conservation of the electrode layer of gel:

(1) After each use, apply a slight quantity of water on the adhesive gel and the let it dry in open air for a few seconds before replacing it on the support with silicone.
(2) Tightly close the envelope containing the electrodes to prevent dehydration.
(3) Store the electrodes at room temperature.

It is important to remember that:

1. The duration of the working life of the electrodes depends on their maintenance, the cleanliness of the skin to which they are applied, and the type and intensity of current used.
2. The electrodes must be replaced when they no longer adhere to the skin.
3. The electrodes must be placed only on unbroken skin.
4. Whenever signs of allergy reaction or irritation appear, the stimulation treatment must be suspended and a physician must be contacted.
5. The electrodes have been designed for personal use.

11.1.2 - Maintenance of the electrode cable insulation

Prior to each electro-stimulation session, the state of wear of the insulation on the output cables must be checked and replaced materials of the same kind as those originally supplied with the device whenever signs of wear such as cuts and/or cracks are observed on their surfaces.

11.2 - Cleaning the device and/or power supply

We recommend using a damp cloth to clean both the power supply and the device. Never use liquids because no protection against penetration by liquids has been provided (IP20).

11.3 - Replacing the power supply

We recommend always checking the state of wear of the insulation (power supply casing and cables) prior to connection to the power mains and replacing the power supply immediately whenever signs of even only partial damage are observed.

11.4 - Immediate Maintenence

Immediate maintenance by New Age Italia srl or its authorised personnel must be performed whenever:

(1) the device has been subjected to external mechanical stress, such as whenever it has fallen or been dropped;
(2) the device has been subjected to serious overheating, such as whenever it has been left in the vicinity of sources of intense heat;
(3) the suspicion that liquids may have penetrated the interior arise;
(4) the power supply, casing or other parts of the device have been damaged, broken or missing;
(5) the operation of the device appears altered.
(6) the display shows the SERVICING error message.

⚠ For safety reasons, we recommend never using accessories (such as electrodes, sponges, dials and power supplys) other than those provided as standard equipment.

⚠ The frequency of maintenance, operation control and the check on compliance to EN60601-1 Safety Standards for medical devices to be performed with a secur-tester is annual. The useful working life of the device is guaranteed by the Manufacturer only whenever these maintenance intervals have been duly respected.

NOTE: We recommend having these control operations performed only by New Age Italia srl or the specialised personnel authorised by this latter. The device can be sent directly to the Manufacturer's servicing laboratories or the dealer who sold it for servicing.

New Age Italia srl

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Chap.12 - SYMBOLS

CLASS II DEVICE

BF-TYPE DEVICE

IMPORTANT: CONSULT DOCUMENTATION ENCLOSED

CE

0476

THIS DEVICE BEARS THE EC MARK IN ACCORDANCE WITH THE PROVISIONS OF EEC DIRECTIVE 93/42.

Chap.13 - WARNINGS

⚠ Use the device only with electrical systems in compliance with the Safety Regulations in force.

⚠ The device has an IP 20 Protection rating (see "Technical Features") and its operation in the immediate vicinity of liquids is discourages because no protection has been provided against penetration by liquids.

⚠ We discourage using the device in the immediate vicinity of mobile phones (which must be kept at least a few meters away).

⚠ Using the device near (at a distance of 1 meter, for example) short-wave or micro-wave therapy device can produce instability in the electrical stimulator's output.

⚠ Never connect the patient simultaneously with the electro-stimulator and a HF surgery device in order to avoid risks to both the patient and the stimulator itself.

⚠ The device does not generate electromagnetic fields.

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

⚠ The operator must refrain from touching the patient and live parts at the same time.

⚠ The device operates with all its specifications only when the room temperature is maintained between 5 and 40° C with humidity of less than 80%. The same conditions must also be maintained during transport and storage.

⚠ Whenever serious malfunction and/or breakage occurs, we recommend sending the device exclusively to the Manufacturer.

⚠ Never operate the device near inflammable substances.

⚠ Remember that the use of the same electrodes, sponge bags and conductive straps on different patients can lead to the transmission of infection.

⚠ Never use electrodes, gels and accessories other than those supplied as standard.

⚠ It is very important for the patient to be informed of the type of sensation that should be experienced during stimulation in order for the operator to be able to interrupt stimulation by using the controls or

⚠ Keep the device out of the reach of children.

Chap.14 - TECHNICAL DETAILS

14.1 - Power supply

Power supply: Brand - Alpha Elettronica Mod. BE272 -28 in
PRI: 230V~ 50Hz SEC: 12V- 1A 12VA max
Internal power supply: rechargeable Ni-MH battery (6V-1.5Ah)

14.2 - Output

The primary electrical characteristics of the currents that can be generated with Pocket are provided below:

TENS
Imax= 100 mA
fs= 1-200 Hz
Ton= 50, 70, 100, 150, 200, 250µs
Operation: Burst /continuous

Rectangular diphase
Imax= 120 mA
fc= 1-160 Hz
Ton= 100-500 µs
Operation: Burst /continuous

Key to parameters

Imax: indicates the maximum value of the current delivered in peak or continuous form depending on the type of current delivered.

fs (fc): frequency of stimulation or contraction (fc) for motorial excitation currents

Ton: duration of the stimulation pulse

Output channels: 2.

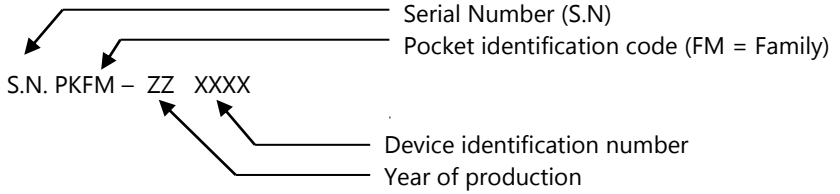
Continuous component: nil for either currents.

14.3 - Other characteristics

- Dimensions: 175x105x40h [mm] Weight: 400 gm
- Class: II Type: BF
- Classification in regard to penetration by liquids: IP20
- Safety in presence of inflammable anaesthesia gases: not in AP or APG category
- Device for type of operation: continuous

Built in compliance with the following standards:

- EN 60601-1 (1990) + A1(1993) + A2(1995) + A12(1993) + A13(1996)– Electro-medical devices: General safety rules
- EN 60601-1-4 (1994): Additional standard: Programmable electro-medical devices
- IEC 601-2-10 (1987) – Electro-medical devices: Particular standards for neuromuscular stimulators.
- IEC601-1-2 (1993) – Additional standard: Electromagnetic compatibility – Prescriptions and tests
- CEI 62-84 (IEC487) – Symbols for electro-medical devices



Chap.15 - STANDARD EQUIPMENT

Pocket comes complete with both standard equipment for the device and specific standard equipment for the POCKET selected for use with the electrical stimulator. The specific standard equipment for the POCKET is provided together with the POCKET even when the POCKET is purchased without the device. The equipment can change for internal requirement.

15.1 - Standard equipment for POCKET

N°1 Pocket device
N°1 Output cable
N°2 Splitter cables
N°4 Pregelled electrodes 50x50mm
N°2 Pregelled electrodes 50x90mm
N°1 Power supply Mod. BE272- 28 in
N°1 Device holder bag
N°1 Pocket Operation manual

15.2 - Optionals and expendable materials

Pregelled electrodes, splitting cables, conductive straps.

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