
UStim

Neuro Muscular Electrical
Stimulation Unit



Manufactured for:
Pain Management Technologies

User's manual
Rev.2 (10/19/2012)

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1. Introducing EMS

E.M.S. stands for Electrical Muscle Stimulation.

Following pain management, the stimulated muscular contraction is the next most popular application of electro-therapy.

After many years, E.M.S. has been used to treat and prevent the localized muscular hypotony, in the rehabilitation field. Now it has become a recognized and well-proven aid to physical exercise.

Research, technology and quality engineering have made EMS a safe and highly effective muscular training system, as a complementary way to perform a selective muscular training.

●

●

How USTIM can help you?

If you need to recover the muscular tone of a defined area of your body, after a period of immobility, USTIM can help you.

If you need to regain your shape, but you don't have enough time for regular exercise, USTIM can help you.

If you need to improve the performance of specific muscles and the effectiveness of the physical exercises, USTIM can help you.

11. WARRANTY

In addition to your statutory rights, the Manufacturer agrees that if any defect in materials or workmanship appears in this product within two years after the original date of consumer purchase, it will be repaired or at it 's option, replace the product in question free of charge. This applies only if the product has been used for domestic purposes and has not been damaged through misuse, accident or neglect and has not been modified or repaired by anyone other than the Manufacturer or its authorized agents.

If a defect appears, please make sure that the unit is being used in accordance with the instructions, if so, return it with this warranty and the proof of purchase to your nearest USTIM dealer. Note: only our authorized service agents should carry out Repairs of the USTIM units.

Exclusion: The batteries and electrode pads are not considered covered by this warranty.

How does USTIM work?

Through a couple of self-adhering electrodes, stimulation pulses are applied over the muscle; as a result, the muscle will alternatively contract and relax, exactly as it happens during the physiological activity but with the advantage of avoiding the general sense of fatigue.

The correct positioning of the pads is important, so various body maps have been included to show the electrodes positioning, in order to achieve maximum effectiveness.

Benefits cannot be expected after one session. The most important benefits will be obtained after repeated treatment sessions and over an extended period of time.

2. Muscular Stimulation techniques with EMS

At the first approach of muscular electro stimulation, the most frequently asked questions are the following:

Which is the most suitable wave shape?

Which frequency shall be used?

What is the pulse width?

and which is the best value?

Which intensity level must be used?

Where to place the electrodes?

IMPORTANT: Read at least the text in bold characters; it will be very useful for obtaining the best effectiveness through the use of the unit.

Electrodes maintenance



The electrodes supplied with unit are self-adhesive and can be used several times, by the same patient. Being intended for personal use, they don't require any cleaning nor disinfection procedure. Skin must be allowed to breathe, so the pads should be removed periodically. When not in use, the pads should be placed onto the clear plastic shield. The condition of the pads does affect the conductivity and the performance of the unit. When the pads initially lose their adhesive quality, it is possible to reactivate their adhesiveness by applying a fine spray of water. Once the pads have finally lost their adhesive quality, new Pads should be purchased.

Allergic reactions to the self – adhesive pads can occur, even though they are hypoallergenic.

- Do not apply to broken skin.
- Do not apply a pad to skin that does not have normal sensation. If the skin is numb, stimulation will not be felt and too great an intensity might then be used accidentally.

10. GENERAL INFORMATION

Statement: This unit is FDA approved, and according to the FDA regulations, it is classified a Medical Device class IIa.

PRECAUTIONS

1. Do not immerse the unit in water
2. Do not place the unit close to excessive heat
3. Use only the specified batteries: 2x 1.5volt AA Alkaline. Using of any other battery could damage the unit.
4. Do not use the unit while asleep.
5. Remove the batteries from the unit, when it is not used for a long time.
6. Keep the unit away from sources of high magnetic fields such as TV'S, microwave ovens and hi-fi speakers, as these may affect the LCD screen.
7. Temperature & Relative Humidity of storage and transport: -20°C to +80°C, 8% to 80% R.H.



The wave shape

To obtain a stimulated muscular contraction, we are obliged to produce a depolarization of one or more motor units.

The better way is to apply a current flow on a motor point, that is to say the point where the nervous fiber innervates the muscle fiber.

As the human tissues very similar to a capacitor, from the electric point of view, the better effectiveness for the electro stimulation is obtained by using a pulse wave, having a very steep rising front. The pulse width should match the chronaxy value of the muscle to be stimulated.

A mono-phasic pulse could be used, but it has been demonstrated that a biphasic pulse is more comfortable, without reduction of the effectiveness. The biphasic pulse has no galvanic effect, so that it is also suitable to be used over areas including metallic prosthesis.

Different types of biphasic pulses could be generated:

In the drafts below, we can see pictures of the biphasic symmetrical pulses and the biphasic alternated pulses.

USTIM unit can generate true biphasic symmetrical pulses (galvanic-free), as well as symmetrical alternated pulses.

The biphasic symmetrical pulses are generally the most suitable for treating a single

muscle. The electrode connected to the



positive (red) wire will be the active electrode.

The symmetrical alternated pulses are most suitable to treat a couple of muscles with the same channel, making equal the effect under each electrode.



PRESET programs									
P14 - EXPLOSIVE FORCE 1 (under USTIM®)									
100	250	3	20	0	0	2	B	15	
P15 - EXPLOSIVE FORCE 2 (under USTIM®)									
110	200	2	20	0	0	1	B	15	
P16 - EXPLOSIVE FORCE 2 (under USTIM®)									
120	150	1	20	0	0	1	B	15	
P17-RECUPERATION									
9-1	250	40	0	0	0	0	B	18	

※ A means "biphasic Alternated wave"

B means "Biphasic symmetrical wave"

PRESET programs									
P4 - WARM-UP									
5	250	60	0	3	3	0	B	5	
P5 - AEROBIC RESISTANCE									
10	250	30	2	2	1	3	B	40	
P6 - AEROBIC RESISTANCE (under USTIM®)									
20	250	20	3	2	1	3	B	60	
P7 - TONIFYING									
30	200	6	4	3	2	3	A*	20	
P8 - HARDENING									
40	250	3	2	0	0	3	A	20	
P9 - FORCE + RESISTANCE									
50	250	8	4	1	1	8	B	25	
P10 - FORCE + RESISTANCE (under USTIM®)									
60	250	6	3	1	1	6	B	25	
F Hz	P µs	Work	Rest	Rise	Fall	F _←	Wave	Total	
P11 - FORCE 1 (under USTIM® control)									
70	250	6	12	0	0	5	B	15	
P12 - FORCE 2 (under USTIM® control)									
80	200	4	6	0	0	4	B	15	
P13 - FORCE 3 (under USTIM® control)									
90	150	4	10	0	0	3	B	15	

The stimulation frequency (also called Pulse Rate)

After defining the wave shape to be used, a single pulse could also produce a momentary contraction like a “wriggle”; however, to obtain a sustained contraction, we must supply a pulse train, characterized by a “frequency”. Frequency (also called “pulse-rate”) is the repetition rate of pulses in a second.

The frequency to be used will depend on the type of fibers to be stimulated. Any muscle includes slow fibers characterized by an aerobic metabolism, and fast fibers characterized by anaerobic metabolism. **If we want to stimulate a muscle of which slow fibers are dominant, we have to use low frequencies (1 to 30 Hz). On the other hand, if we want to stimulate muscles having fast fibers dominance, we have to use higher frequencies (50 to 120 Hz.).**

The frequency of pulses can also define the aim of the electro stimulation, as passive training. Physiological and metabolic characteristics of a muscle, in fact, can be modified by the electrical stimulation.

The high frequency stimulation can partially “convert” the tonic fibers in phasic fibers, these last characterized by a higher development of instantaneous force, with the prejudice of muscular resistance.

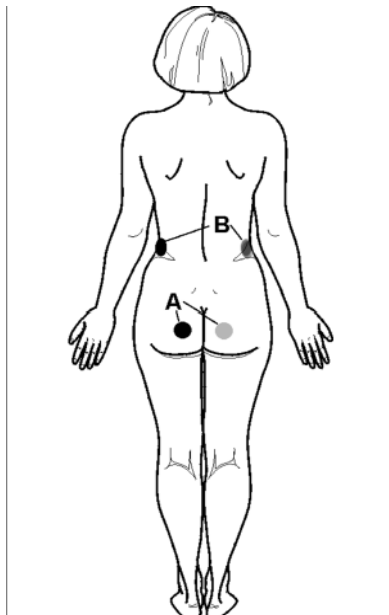
A very low frequency (1 to 10 Hz) will be always accepted, like a massage and it will not produce fatigue. The physiological effect is related to the blood flow improvement, bringing to a better tissue feeding and facilitation in the catabolic drainage (absorption). A low frequency is suitable for starting a session, allowing a muscular warm-up, and for ending a session, allowing a fatigue recover.

9. Programs loaded in your USTIM

Manual programs									
F Hz	P µs	Work	Rest	Rise	Fall	F↔	Wave	Total	
Free program 0-without USTIM® control									
5	250	10	0	3	0	0	-	5	
Free program 1-under USTIM® control									
18	250	10	2	2	0	5	-	15	
Free program 2-under USTIM® control									
35	250	6	4	1	0	5	-	15	
Free program 3 - under USTIM® control									
60	250	5	8	0	0	4	-	15	
PRESET programs									
F Hz	P µs	Work	Rest	Rise	Fall	F↔	Wave	Total	
P1-DECONTRACTURATING									
1	300	30	0	2	20	0	B*	8	
P2 - MYORELAXING									
3	250	60	0	2	2	0	B	10	
P3 - CAPILLARIZATION									
8	250	60	0	2	2	0	B	10	

**Example of electrodes placement
over the GLUTEI + WAIST**

Wave: ALTERNATED



The Pulse WIDTH

According to scientific research, the most appropriate waveform to get a muscular contraction is the symmetrical biphasic pulse. The pulse-width must be such to allow a transfer of sufficient energy to excite the muscular fibers. A wider pulse-width doesn't carry any advantages; instead, it can create an useless bother to the patient, through the involvement of the nervous fibers which carry the signal "pain". **The ideal pulse-width corresponds to the CHRONAXY value of the muscle to be stimulated.**

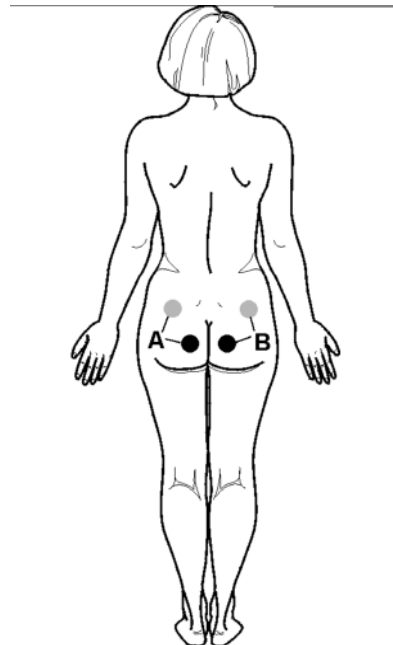
Each muscle is characterized by a value of chronaxy that basically expresses the neuro-muscular composition and the functional destination of the same muscle.

Table 1 - Examples of values (min. and max.) of CHRONAXY, statistically observed on some muscles of a healthy subject.

<i>Muscle</i>	<i>Chronaxy</i> min.(μsec)	<i>Chronaxy</i> max.(μsec)
Deltoids	80	130
Pectoral	80	150
Biceps	70	100
Abdominals	90	180
Rectos femoral	100	600
Quadriceps	100	500
Hamstring	180	2000
Gluteus	100	150
Tibia	500	1000
Calves	100	800
Peroneal	200	1700

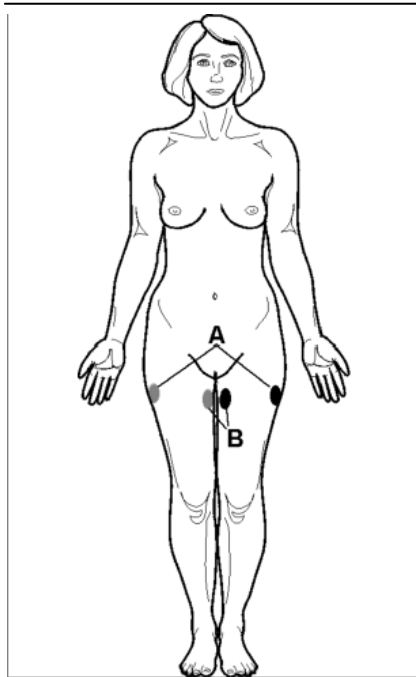
Example of electrodes placement over the GLUTEI

Wave: simple BIPHASIC



**Example of electrodes placement
over the THIGHS**

Wave: ALTERNATED



**The four phases of the
electro stimulation**

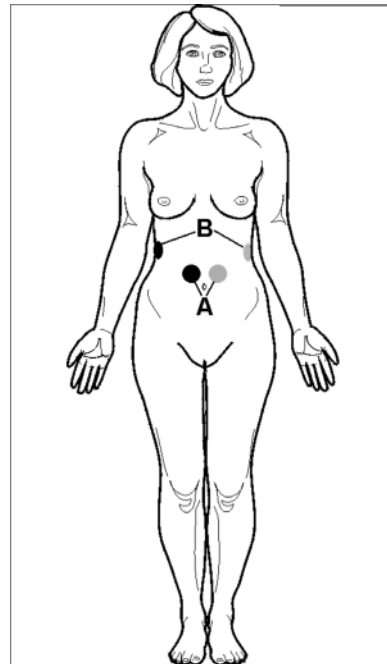
The muscular electro-stimulation, as well as the voluntary contraction, must foresee an ACTIVATION phase (stimulation), followed by a REST phase (pause). The REST phase is very important for the muscle; in fact during the contraction, the capillary circulation comes necessarily hindered and, if the muscle stays in contraction for a long time, without a congruous phase of rest, it may cause the so-called "ischemia," that is to say a limitation of the local blood circulation, very harmful for any human tissues.

The blood capillary flow, hindered during the contraction, but facilitated during the rest, constitutes the main feeding way for muscles; the muscles, particularly, draw some of all the elements for the production of energy (oxygen, proteins and varied enzymes).

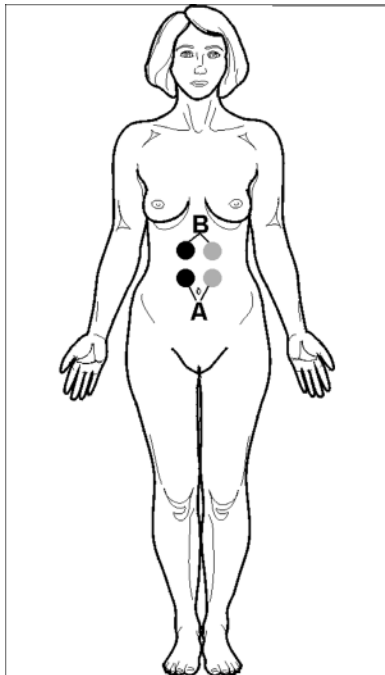
The criterions of selection of STIMULATION time and PAUSE time are fairly simple, also if necessarily empirical: the higher is the stimulation level, the smaller will be the ACTIVATION phase with respect the REST time. For example: if I want to stimulate a muscle to get a maximal contraction, I have to limit the contraction time to very few seconds and have to introduce, between each contraction, A REST period equivalent to at least 5 times the contraction period.

To simulate the voluntary contraction, or simply to make less annoying the stimulation, it could be beneficial to introduce a PROGRESSION phase and a REGRESSION phase; we'll call the two new phases respectively RISE time and FALL time

Example of electrodes placement over the ABDOMEN + WAIST.
Wave: ALTERNATED



**Example of electrodes placement
over the ABDOMINALS .
Wave: ALTERNATED**



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The stimulation level

Mathematical formulas for determining the optimal level of the electric stimulation don't exist. The intensity must be suitable to provoke the level of the aimed contraction, but without bother or straight pain for the patient. **Furthermore it is important not to forget that the quantity of muscular fibers recruited depends not only on the applied intensity but, above all, on the positioning of the electrodes.** Very often it is enough by moving an electrode few millimeters, to get a better contraction.

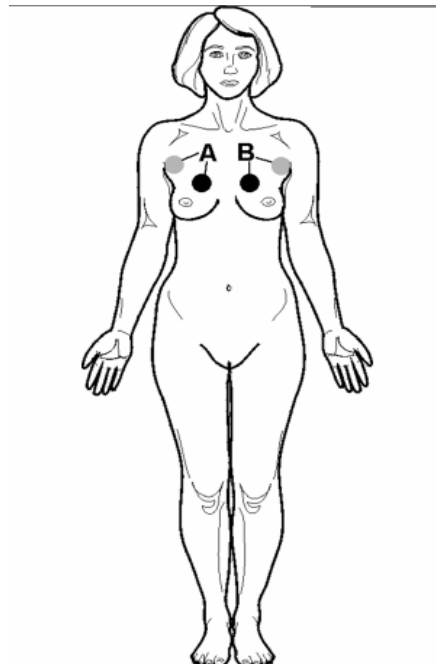
The principle to carry the electro stimulation to maximal levels, often above of the pain threshold, is a practice to be performed with extreme caution; although the harmlessness of the high level electro stimulation doesn't have solid foundation of scientific research, and not sufficient studies have been carried out to evaluate some possible secondary effects of muscular degenerative damages due to over-stimulation.

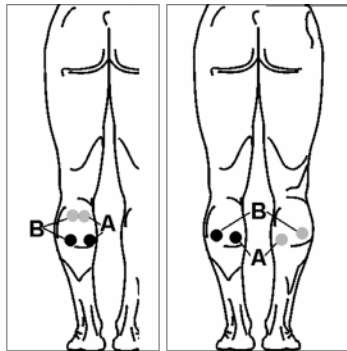
14

We don't know if a high level of stimulation, above the subjective tolerance limit, could be harmful for the muscular or nervous fibers. Usually, during a "strengthening" session, the patient is instructed to increase the intensity each 3 or 4 contractions; that becomes almost essential, in consideration of the progressive fatiguing of the fast twitch fibers. If you try, to "compensate" the smaller level of strength produced, due to the unexcitability of some fatigued fibers, with the recruitment of other muscular fibers, showing an higher excitement threshold.

WARNING! An involuntary analgesic effect takes place during the electro stimulation, through the stimulated per-production of endorphins. A pain, in case provoked by the electro stimulation, that in any cases could constitute a safeguard threshold, has attenuated by the analgesic effect of the electro stimulation. The wisdom of moderation always is the best guide!

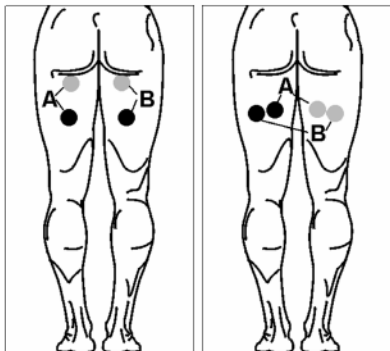
**Example of electrodes placement over the BREAST (pectorals).
Wave: simple BIPHASIC**





CALVES
(biphasic)

CALVES
(alternated)



HAMSTRINGS
(biphasic)

HAMSTRINGS
(alternated)

Electrodes positioning

We know that an electrical generator for producing a current flow must be “closed” on a load. The load, in the electro stimulation, is represented by the muscle to be stimulated. The connection between the generator and the treatment area (load) will be performed by means of a pair of conductive electrodes, having the job to transfer the electrical potential (voltage) to the load (muscle). A closed circuit needs at least a pair of electrodes; it is impossible to obtain a current flow with only one electrode. A current flow must always have an input point and an output point.

If the aim of the electrical stimulation is to produce a muscle contraction, at least one of the two electrodes must be placed on that muscle, but where is the best position?

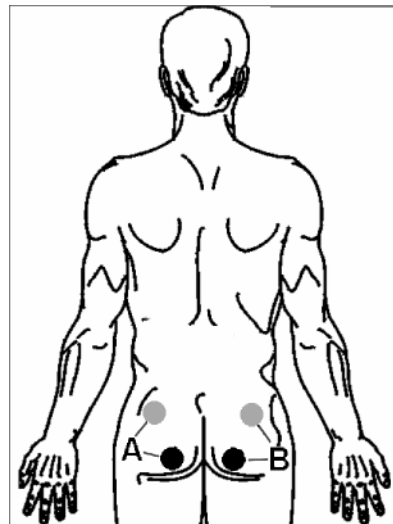
The better responding point, in a muscle, is the “motor point”; by stimulating on the motor point that we can obtain a better muscular recruitment with less energy. The other electrode, theoretically, could be applied anywhere, but in practice; it is advisable to place it proximally, on the same muscle.

If we have to stimulate two contralateral parts (two limbs), it is also possible to place the electrodes of the same circuit, over the two-contralateral motor points (avoiding transtoracic stimulation).

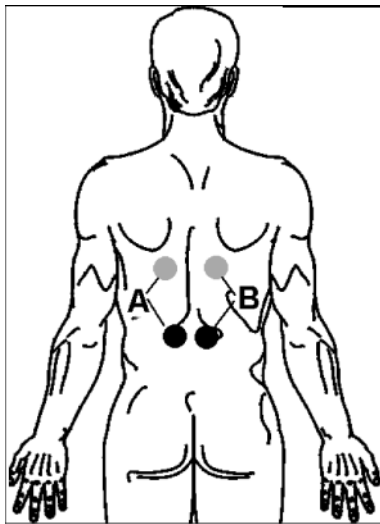
The motor point is the better responding point to the electro stimulation, so the better way to find it, is to try different near points.

Example of electrodes placement over the GLUTEI muscles.

Wave: simple BIPHASIC



Example of electrodes placement
over the SPINAL muscles.
Wave: ALTERNATED



3. CONTRAINDICATIONS BEFORE USE PLEASE READ THE FOLLOWING:

Who shouldn't use EMS?

Do not use USTIM unit under the following circumstances:

WARNINGS!!!

- (1) During the first 3 months of pregnancy, nor at anytime, on the abdomen during pregnancy.
- (2) If you have a heart pacemaker or serious heart rhythm problem.
- (3) If you are driving or operating machinery.

Who should be cautious using EMS?

1. If you have epilepsy, consult your doctor before using USTIM.
2. For children under 12, apply only under medical supervision.

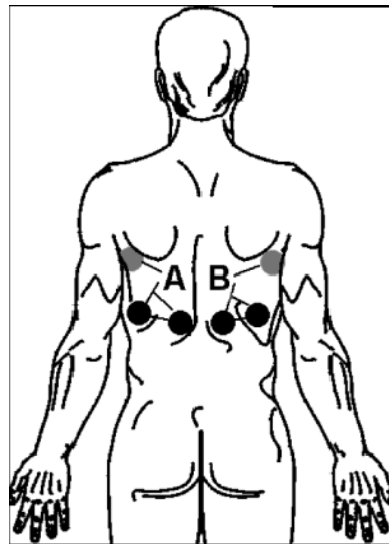
Where should electrodes NOT be placed?

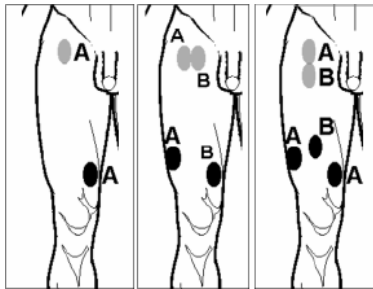
1. On the carotid sinuses located at the sides of the neck (Where a doctor feels for a pulse), or over the eyes.
2. On both sides of the head at the same time.
3. On broken skin or on areas where normal sensation is absent.
4. On the heads of children under 12.

IF IN DOUBT, PLEASE CONSULT YOUR DOCTOR.

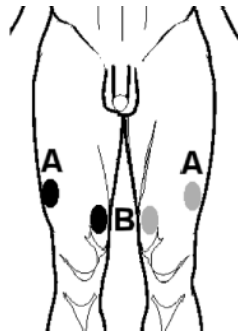
Example of electrodes placement over the DORSAL muscles.

Wave: simple BIPHASIC





**VASTUS VASTI CUADRI-
INTERNAL EXT+INT. CEPS**
Wave: simple BIPHASIC



**VASTUS MEDIAL + LATERAL (both
sides) - Wave ALTERNATED**

4. INSTRUCTIONS FOR USE

Your USTIM unit has been designed to be simple and easy to use yet highly effective. Before use please read all the instructions and ensure that you don't fall into one of the groups previously mentioned, who shouldn't use EMS.

CONTENTS:

Your USTIM pack should contain the following:

- 1 USTIM Unit,
- 2 Leads,
- 4 Self Adhesive Pads with Connectors,
- 2 Alkaline AA1.54v (LR6) Batteries,
- 1 Instruction Booklet (which you are reading).

Being sure you have all the contents, please proceed to assemble the unit.

How to assemble your unit

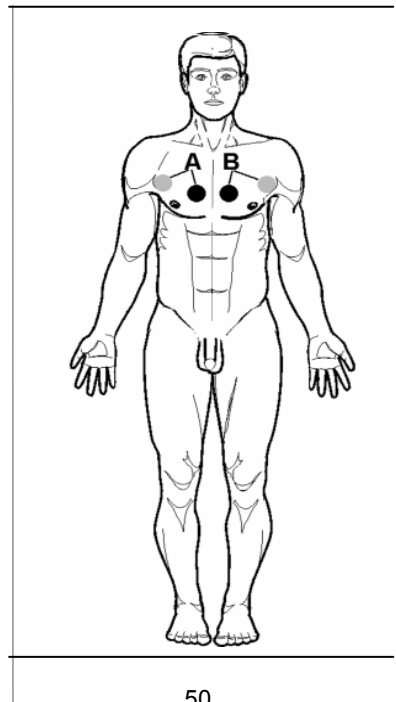
Assembly of the USTIM unit is very easy and requires only five steps.

STEP 1- BATTERIES: Remove the battery cover and insert two batteries, as shown on the diagram inside the battery compartment. Re-apply the battery cover.

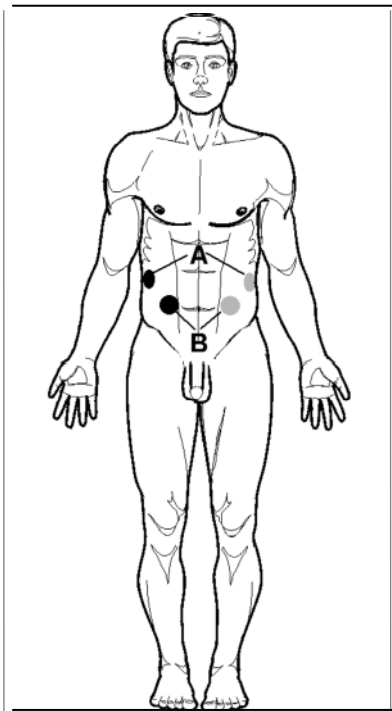
Note: Your unit will not function if the batteries are inserted incorrectly. To check, press the ON/OFF button once and the LCD display will start up. After performing this check, press the button again to switch the unit off.

CAUTION: There is a risk of explosion if the batteries are fitted incorrectly. Replace with AA Alkaline 1.5 volt batteries. Do not mix old and new batteries. Do not dispose of the batteries in a fire; keep them out of reach of children. The batteries must be removed from the device before it is scrapped and that they are disposed safely.

Example of electrodes placement over the PECTORALS. Wave shape BIPHASIC



Example of electrodes placement over the ABDOMINAL + OBLIQUI muscles. Wave: **ALTERNATED**



STEP 2 - LEADS: Decide to use the unit with one lead or two, the body maps at the back of this guide will help you decide this.

Unravel one or both leads and insert the plug(s) into either of the jacks at the top of the unit. If only using one lead, insert into the ch1 jack as marked on the unit.

STEP 3 - PADS: Remove electrodes from the bag and connect to the leads

STEP 4 - PLACEMENT OF PADS: Ensure wherever you intend to place the pads, that the skin is clean and thoroughly dry. Remove the pads from the clear plastic shield and position on your body as required.

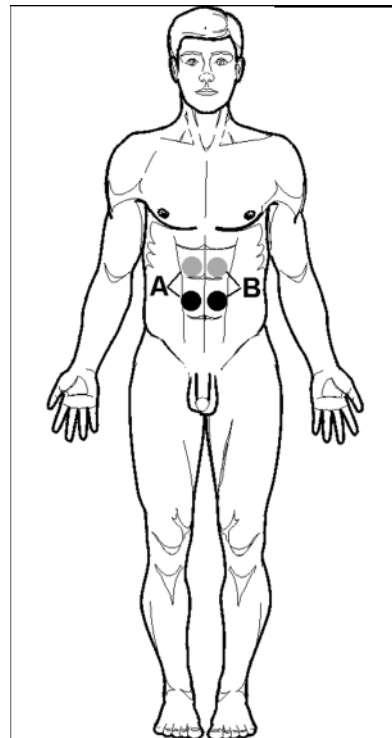
STEP 5- Read section on "Operation of the USTIM Unit", and decide how to use the unit for the treatment.

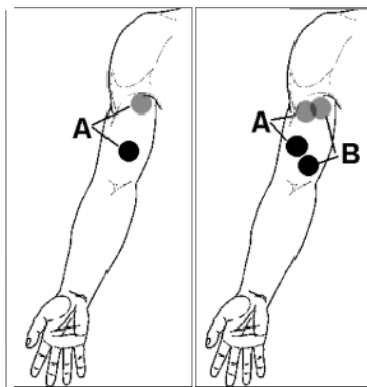
NOTE: AFTER USE

Always ensure that the unit is switched OFF before removing the electrodes. After use, return the pads to the clear plastic shields. There is no need to separate the unit from the leads and pads.

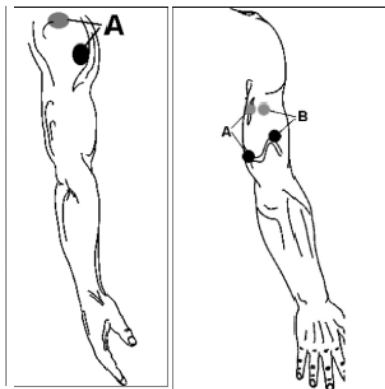
Life of the pads: Replace the pads when they lose their adhesive quality in order not to affect the efficiency of the unit. When the pads initially lose their adhesive quality, it is possible to reactivate their adhesiveness by applying a fine spray of water.

**Example of electrodes placement
over the ABDOMINAL muscles
Wave-shape ALTERNATED**





BICEPS



DELTOID

TRICEPS

Advantage of the USTIM

The aim of USTIM is to provide wide treatment options while maintaining or improving the operation friendly to the user.

When a non-professional user tries to apply a NMS unit, the first question is: "which is the most suitable program for my purpose?"

Although offering 17 programs in memory, the USTIM system can build the suitable program if needed. Knowledge about electro-stimulation is not required to the patient or the operator.

The "Interactive" parameter's set-up of the USTIM system allows the automatic determination of WORK/REST time in function of the Frequency and of the Intensity level. This is possible, simply by considering the muscular physiology in the core program of the unit.

The ideal electro-stimulation parameters, automatically set, will allow the user to simply just select: the AIM of the session (that is the maximum frequency) and the AREA involved (that is the pulse-width).

The manually settable programs (M0 to M3) have basically the same parameters. As FREE programs they are available for the user BUT with the easiness of USTIM system (only M1 to M3 are under the USTIM control, while the M0 is totally free). A special algorithm, built-in the processor of the USTIM unit, will take charge to AUTOMATICALLY SET the timing parameters, with the function of selectable frequency. The user can prepare a new protocol simply defining the frequency value; the unit automatically will set all the timing parameters. The other parameter (Pulse Width) must be set in function of the muscle to be treated, according to the table (page 11).

8. PLACEMENT OF ELECTRODES

The following drawings show different electrodes positions, according to the muscle to be stimulated.

Cables and Polarity management:

Each channel (output) is connected to the electrodes through a couple of cables, terminating with male 2mm colored connections: one red, one black.

General principles:

- 1. Using the symmetrical biphasic wave shape, the most important effect will be felt under the positive electrode (red).*
- 2. If you want stimulating just one muscle, with a channel, you have to use the symmetrical biphasic wave shape and apply the positive electrode (red) over the motor point.*
- 3. If you want stimulating two contra lateral muscles, using the same channel, you have to use the symmetrical alternated wave.*

Cumulative time recording

Press and hold the "FUNCTION" and "Prog" keys simultaneously at least 4 seconds, the display will show the cumulative using time since last reset. It is possible to reset this value by simply pressing and holding down the "T down" and "FUNCTION" keys simultaneously at least 4 seconds. Press again and hold-down the "Prog" and "FUNCTION" keys, you can return to the normal operating mode.

Innovating features:

Single parameter to be set by the user, and automatic setting of any time-based parameters.

Wider possibilities of program setting

More suitable for the professional use, but also suitable for personal use, because the unit is very **easy to use**.

Maximum effectiveness of the programs **without** the need for the operator to **understand** any concepts about electro-stimulation.

NOTE: AFTER USE

Always ensure that the unit is switched OFF before removing the pads. After use, return the pads to the clear plastic shields. There is no need to separate the unit from the leads and pads.

Parameter's retention

During the session, you can modify one or more parameters of a manual program M0---M3 (except the intensity and the session time), the new values will be retained, whatever switching-OFF the unit or removing the batteries.

On the contrary, any change of any parameter of preset programs will be lost, when the unit is switched-OFF.

Session time

When the treatment timer is set, it will begin to count down one minute by one minute; Once it count down to zero, the unit will automatically shut off;.

Auto-shut-OFF

When the unit intensity levels are 0 on both channels, and it has not been in use for 5 minutes, the unit will be shut off automatically.

The Program LOCK function

Simultaneously press and hold the “Prog” and “Lock” keys at least 4 seconds, and the program in use will be locked. In such state the user will be disabled to change any parameters of the locked program; however it is allowed to:

- *Select another program (manual or preset)
- *Set the intensity
- *Set the session time.

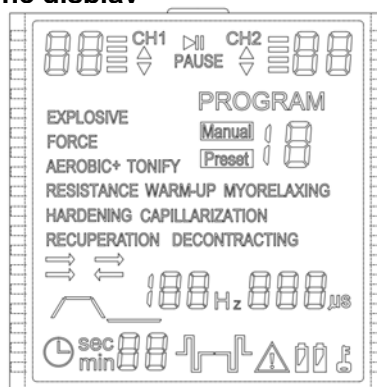
The program-lock state will be unaffected by switching-off the unit or by removing the batteries.

When the unit is program-locked, and the locked program is selected, a small symbol of a “key” will blink on the right lower corner of the display.

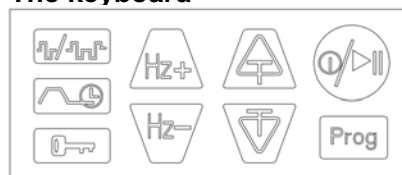
5. Practical use of USTIM

Operation of the USTIM unit is based on few intuitive functions of the dedicated keyboard, which can be verified on the LCD display.

The display



The keyboard



Function of key-buttons



ON/OFF/Play/Pause key allows switching ON/OFF the unit and pause it, when needed.

Press it once, to switch-ON the unit (when the unit is OFF). When the unit is ON and the intensity level of both channels is 0, by pressing once more the same key, the unit will switch-OFF. When the unit is ON but the intensity level of at least one channel is above 0, by pressing once more the same key, the unit will go in the PAUSE phase; the output level of both channels will be zeroed and the symbol will be shown on the display. To exit from the PAUSE mode, you can press once more the same key; the intensity level of both channels will be progressively restored in 2 seconds. If you would like to switch-OFF the unit, while it is supplying stimulation, you can press and hold-down the ON/OFF key for at least 2 seconds.

RISE-FALL times: 0-5s in steps of 0.25s

ACTION time: 1-60s in steps of 1s.

REST time: 0-60s in steps of 1s.

TREATMENT time: Continuous, 10, 20, 30, 45, 60, 90 minutes

Other features

The LOCK function

Simultaneously press and hold the “**Lock**” keys at least 4 seconds, and the unit will be locked. In such state the user will be only allowed to:

Set the intensity

Set the session time.

The lock state will be unaffected by switching-off the unit or by removing the batteries.

When the unit is locked, a small symbol of a “key” will appear on the right lower corner of the display.

display. Through the **T up/T down** keys you can change it within 6 seconds, before it re-assume the original function (pulse width).

7. Specifications:

Ch1 intensity is setting in 20 steps of 5mA, from 5mA to 100mA on a 1 K Ω load (peak-to-peak value, by using a pulse width of 100 μ s).

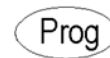
Ch2 intensity is setting in 20 steps of 5mA, from 5mA to 100mA on a 1 K Ω load (peak-to-peak value, by using a pulse width of 100 μ s).

Frequency (Hz): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150 Hz.

Pulse width: 50-400 μ s in steps of 50 μ s

Wave shapes:

Symmetrical biphasic rectangular.
Symmetrical alternated rectangular.



The PROG Button: allows selecting a program, among the M0 (totally free) M1-M2-M3 (under the USTIM control) and 17 Preset programs. For jumping from the M (Manual) programs M0---M3, to the P programs P1---P17, and vice-versa, you have to hold-down the PROG key for at least 3 seconds. Any time the PROG key is activated, the intensity level of both channels is automatically reset to 0.

The Hz+/Hz- Buttons:

Allow modifying the Pulse-rate that is the frequency of the administered pulses. In the manual programs (M1, M2, M3) the USTIM automatically modifies the work-time and the rest-time, according to an internal algorithm, when the frequency is changed. Such self-adapting (or interactive) function, tremendously SIMPLIFIES the use of the unit. Thanks to the USTIM function, it is possible modifying the



frequency in real time, while in use and obtaining the better comfort.

The T up / T down Buttons:

Press to change the Pulse-width.



The FUNCTION Button:

Press to sequentially select the time-based parameters, used in the stimulation program:



- Treatment time,**
- Synchronism,**
- ACTION time,**
- REST time,**
- RISE time,**
- FALL time.**

Any parameter which is selected can be easily modified through the keys **T up / T down**. The symbol identifying the selected parameter will be shown "blinking" on the display; if the parameter is not modified within 6 seconds by the key-buttons **T up / T down**,

Modify the RISE time



After having defined the REST time (or the REST Ch2 time), by pressing again the FUNCTION key within 6 seconds, you can select the parameter RISE time; the relative symbol will be shown blinking on the display. Through the **T up/T down** keys you can then change it within 6 seconds, before it re-assume the original function (pulse width).

Modify the FALL time




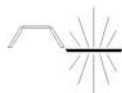
After having defined the RISE time, by pressing again the FUNCTION key within 6 seconds, you can select the parameter FALL time; the relative symbol will be shown blinking, on the

original function (pulse width).

The Ch2 REST time

Normally, the REST time is the same for both channels Ch1 and Ch2. The only exception is when you are using the program M0. In such case, and if you have selected the synchronism alternated, after having defined the REST time of Ch1, you can press the FUNCTION key again to define the REST time of Ch2. The procedure is the same as above. Through the **T up/T down** keys you can change it within 6 seconds, before it re-assume the original function (pulse width).

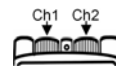
WARNING! The REST time of Ch2 can NEVER be set lower than the ACTION time. In case of a wrong set-up, the ATTENTION Symbol  will blink on the display and the REST time Ch2 will be shown again to be changed.



it will assume the original function (adjusting the pulse-width).

The channels Ch1 and Ch2 always work in synchronous way, which is the times of action and pause assume the same value, for both channels. The alternated mode, of Ch1 and Ch2, is possible only in the program M0. Selecting and modifying the Synchronism parameter is allowable through the FUNCTION key, as above explained.

These two **rotated knobs** which locate on the top of the unit adjust the intensity of channels, left side is for the Ch1, right side is for the Ch2. Turn the knob and the intensity over zero, the corresponding LED light located at the top of the knob will light up.



The Wave-shape Button:

It can be used for modifying the wave-shape, that is, for deciding to stimulate just one or two similar muscles simultaneously with the same channel.



6. Starting a session

When you select one of the 17 PRESET programs, all the parameters will be pre-defined. However, it is always possible modifying the pulse-width, to make it more suitable for different body areas, and the frequency, to make the stimulation more comfortable. Of course, it is not advisable modifying too much the frequency value, because, in such case, the therapeutical destination of the program would be radically changed.

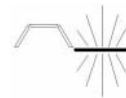
In order to start a session, using a **MANUAL** program by taking advantage of the automatic set-up USTIM system, (this is what we suggest) you need to select one of the programs M1, M2 or M3, then follow the following steps:

- **Set the frequency (pulse rate) to 5 Hz.** It is advisable starting a stimulation session with a low frequency, for allowing a progressive warm-up of the muscular fibers.

programs, permanently in the manual programs.)

Once defined the synchronism, by pressing again the FUNCTION key within 6 seconds, you will select the parameter ACTION time. The relative symbol will be shown blinking, on the display. Through the **T up / T down** keys you can change it within 6 seconds. After 6 seconds it will re-assume the original function (pulse width).

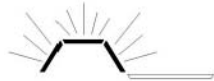
Modify the REST time



After having defined the ACTION time, you can select the parameter REST time by pressing again the FUNCTION key within 6 seconds; the relative symbol will be shown blinking on the display. Through the **T up/T down** keys you can change it within 6 seconds, before it re-assume the

That is, the activation sequence of channel Ch1 and Ch2. The possible selections will be simultaneous or alternated. Once defined the TREATMENT time, by pressing again the FUNCTION key within 6 seconds, the symbol will blink on the display. Through the **T up / T down** keys you can then change the synchronism between SIMULTANEOUS and ALTERNATED. If you will not change the value within 6 seconds, it will re-assume the original function (pulse width).

Modify the ACTION time



The ACTION time of whichever program is preset or defined by the USTIM system, it is not required to modify it; nevertheless, you can change it (temporarily in the preset

- **Increase the stimulation intensity**, until a good but comfortable muscular contraction has been achieved.

- **After 2-3 minutes, gradually increase the frequency value, until the target value.** The target frequency value must be previously defined, according to the therapeutical aim or to the session finality.

The basic concepts about the frequency selection have been explained in the page 8. It is also possible to take a suggestion from the table of preset programs in the page 66. If you want simply toning a muscle, the maximum frequency will be 30-35 Hz. If the aim is the hardening, you can attain 40-50 Hz. Willing to develop force, you can attain 60-70 Hz.

Resuming the practical operations

Whenever the unit is switched-on, the last used program will be loaded. Willing to apply the same program, simply place the electrodes and setting the intensity level of both channels.

Select another program

Press the **PROG** button for selecting one of the programs in memory (P1 to P17 or M0-M1-M2-M3). **To switch between the MANUAL programs (M) and the PRESET programs (P), press and hold down the PROG button for at least 3 seconds.**

Modify the frequency

Press the **Hz+/Hz-** buttons to change the frequency (pulse rate) of the selected program.

Modify the pulse width

Press the **T up/T down** buttons to modify the pulse width of the selected program.

Either the Frequency or the Pulse width can be whenever changed and the changed effect will be immediately felt by the user.

Through the **FUNCTION** button, it is possible sequentially selecting some other parameters; they can be then modified by the buttons **T up/T down** let's see them in detail:

Modify the TREATMENT time

Press once the **FUNCTION** key, to select the TREATMENT time. You can change it within 6 seconds, by using the **T up/T down** keys. After 6 seconds, the T up/T down keys will re-assume the original function (pulse width).

In the MANUAL programs the change will be retained, while any change in the PRESET programs will be lost.

Modify the SYNChronism between Ch1 and Ch2 (program M0 only)

Only if you are using the program M0, you will be allowed to modify also the synchronism between the channels.