I-TECH
MEDICAL DIVISION

USER MANUAL

I-TECH PHYSIO 4
I-TECH PHYSIO EMG

I.A.C.E.R. Srl
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Technical information

Manufacturer

I.A.C.E.R. S.r.l.

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IACER S.r.l. is an Italian manufacturer of medical devices (certified CE n° 0068/QCO-DM/234-2020 from the Notified Body n°0068 MTIC InterCert S.r.l.)

Declaration of conformity

I.A.C.E.R. S.r.l

Via Enzo Ferrari, 2 - 30037 Scorzè (Ve), Italy

declares under its own responsibility that the product

I-TECH PHYSIO 4

I-TECH PHYSIO EMG

UMDNS Code: **11503 e 11474** (respectively)

has been designed and manufactured according to the European Medical Device Directive 93/4/EEC (transposed in Italy by the D.Lgs. 46/97), as modified by the Directive 2007/47/EC (D.Lgs.37/2010) and further modifications/integrations.

The product has been assigned to class IIa, according to Annex IX, rule 9 of the Directive 93/42/EEC (and further modifications/integrations) and bears the mark

CE 0068

Compliance of the concerned product with the Directive 93/42/EEC has been assessed and certified by the Notified Body:

0068 – MTIC InterCert S.r.l.

Via G. Leopardi 14, Milano (MI) 20123

Certificate no.: 0068/QCO-DM/234-2020

following the certification procedure according to Annex II (excluding point 4) of the Directive 93/42/EEC.

Scorzè, 31/01/2022 — *Place, date*

MASSIMO MARCON — *Legal Representative*

Classification

The I-TECH PHYSIO 4/EMG has the following classification:

- Class IIa (Directive 93/42/CEE, Annex IX, rule 9, 10 and further amendments);
- Class II with BF type applied part (Classification EN 60601-1);
- Equipment protection level IP20, against solid bodies greater than 12.5mm in diameter and liquids penetration.
- Equipment unsuitable for use in presence of a flammable anesthetic mixture with air or oxygen or with nitrous oxide;
- Equipment suitable for continuous operation;
- Equipment unsuitable for outdoors use.

Purpose and scope

Clinical intended use:	Therapeutic
Environmental intended use:	Ambulatory and hospital

The I-TECH PHYSIO electrotherapy medical device is available in 2 versions: I-TECH PHYSIO 4 and I-TECH PHYSIO EMG. The two devices differ only for the presence of the electromyographic module in the EMG version, by which it is possible to obtain an indication of the pre, during and post therapy of muscular activity. The EMG module should not be intended as a medical device with diagnostic evaluations.
Both devices are equipped with medical programs suitable for muscle rehabilitation in general, pain therapy (analgesic and muscular atrophy programs) and functional recovery of muscles after trauma or an accident, specific programs for ionophoresis, incontinence and the treatment of denervated muscles, as well as non-medical programs for muscle cool-down, muscle strengthening, beauty treatments (firming and drainage). It is possible, therefore, to treat a wide range of both chronic and acute pathologies.
Due to the number of pathologies, these devices are intended for use by a professional therapist, a fitness coach at a public / private center or clinic, or professional operators in general.
The patient population intended for electrotherapy treatment using the I-TECH PHYSIO EMG and / or I-TECH PHYSIO 4 devices includes patients of both sexes, men and women, of age unless otherwise indicated by medical doctors. For further details, please refer to the *Contraindications* section.

The CE0068 marking on the device applies exclusively to medical programs (see the following paragraphs concerning the detailed description of the programs).

Technical features

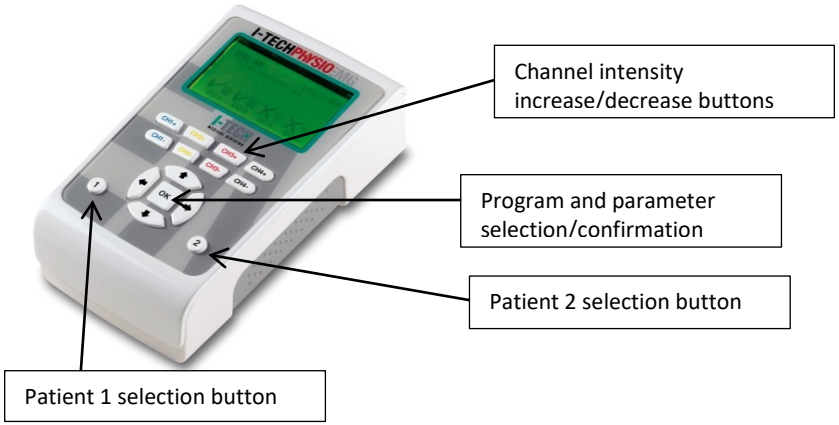
Characteristics	Specifications	
Power supply	Rechargeable batteries NiMH 7.2V, 2000mAh (dimensions 6xAA)	
Battery charger	Model EA1018G-12V 100-240VAC, 50-60Hz, 1.0A input 12VDC, 2.0A output Not replaceable 250VAC, 2A fuse	
Max. absorbed current	1.6 A	
Absorption	DC 12V, 1.5A	
Output power	120mA (with 1000 Ohm rated load)	
Isolation class (EN 60601-1)	II	
Applied part (EN 60601-1)	BF	
Dimensions (mm) (length x width x height)	180x110x50	
Protection level IP	IP20	
Conditions of use	Environmental temperature	From +10 to +40°C
	Relative humidity	From 15 to 93%
	Atmospheric pressure	From 500 to 1060hPa
Storage and transportation conditions	Environmental temperature	From +5 to +40°C
	Relative humidity	From 15 to 93%
	Atmospheric pressure	From 500 to 1060hPa
Electrotherapy (models 4 and EMG)		
Number of programs	A total of 86 programs divided as follows: - n. 26 prog. TENS/ANALGESIC/IONOPHORESIS (diadynamic, faradic, Kotz and interferential currents). - n. 25 prog. REHAB (denervated muscles,	

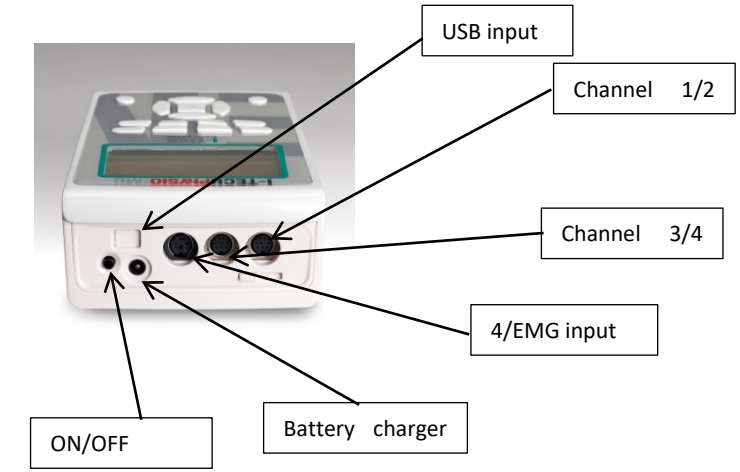
Characteristics	Specifications
	incontinence, pains). - n. 17 prog. EMS (strengthening, heating, muscular cool-down and beauty treatments). - n. 18 prog. Customisable.
Max out	160Vpp with a load of 1000 Ohm
Frequency	Between 0.5 and 40kHz
Impulse	Between 20 microseconds and 400 milliseconds
Duration of therapy	Preset programs, free memories of up to 60 minutes
Electromyography (only EMG model)	
Dynamic input	0 ÷ 4.16mVpp
Bandwidth	16 ÷ 402Hz
Input level of noise	< $3V_{RMS}$
Gain	794V/V
Input impedance	> 100GΩ over the whole band
CMRR	>100dB
Dynamic output	0 ÷ 3.3V
Resolution	10bit
Sampling frequency	1024Hz

ATTENTION: the device has an output current over 10mA**.**

Expected useful life of the device is set in 10 years.

Device and command description

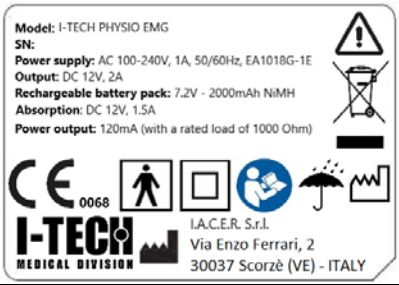




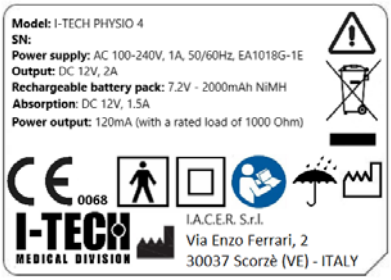
Labels

Label on the back of the device

Model I-TECH PHSYIO EMG



Model I-TECH PHYSIO 4



Simbolo	Significato
	Manufacturer's logo.
	Product CE certification released by Notified Body N° 0068.
	Manufacturer.
	Manufacturing date (YYYY-MM).
	Read instructions for use.
	RAEE directive for the disposal of electronic waste.
	Classe II device according to IEC 60601-1.
	Applied part type BF according to IEC 60601-1.
	Temperature humidity (temperature of the storage environment, on the package).
	Limits of relative humidity (relative humidity of the storage environment, on the package)

Simbolo	Significato
	Not protected against the infiltration of liquids, keep dry.
	Device able to supply current at above 10mA with a load of 1KOhm.

Packaging content

The I-TECH PHSYIO 4 and I-TECH PHSYIO EMG pack contains:

- N° 1 mainframe (I-TECH PHSYIO 4 or I-TECH PHSYIO EMG);
- N° 1 battery charger model EA1018G-1E;
- N° 2 electrotherapy connection cables with 2 mm female connector, length about 2.5m;
- N° 2 iontophoresis connection cables with 2mm female connector, length about 2.5m;
- N° 1 EMS electrotherapy connection cable with 2mm female connector, length about 2.5m (for the prg. Co1 continuous current);
- N° 2 set of rectangular single-patient electrotherapy electrodes;
- N° 2 set of square single patient electrotherapy electrodes;
- N° 1 set of round single-patient EMG electrodes (only for I-TECH PHYSIO EMG);
- N°1 set of square button single patient electrotherapy electrodes;
- N°1 iontophoresis kit (elastic band, 2 rubber electrodes and 2 sponges);
- N°1 PEN-EL nib with tip for EMS stimulation;
- N°1 PHYSIOAMP EMG amplifier module (only for I-TECH PHYSIO EMG version);
- N°1 user manual;
- N°1 user manual of the electrodes' positions;
- N°1 bag for the transportation.

Additional iontophoresis kits are available as accessories on request.

Introduction to the technology

Electrostimulation consists of the electric micro-impulses from I-TECH PHYSIO 4/EMG to the human, conducted through the electrodes applied to the body by means of connection cables.
The fields of application of electrostimulation are pain therapy, muscular rehabilitation, recovery of muscle trophism after injury or a surgical operation, athletic preparation and beauty treatments.
Specific electric impulses are used for every one of these applications.
The stimulation intensity is shown for each channel, on a scale of 0 to 120mA, on the I-TECH PHYSIO 4/EMG. For Sport and Beauty programs, the intensity differs according to the type of muscle or the program in use. The following description helps the user to choose the correct intensity according to impulse.
The type of impulses can be classified as follows:

1. **Tense impulse:** for TENS programs, the intensity should be adjusted to a level between the thresholds of perception and pain. The maximum limit is reached when the muscles surrounding the treating area begin to contract. It is best to stay below that limit.
2. **Microcurrent pulse:** the maximum adjustable intensity is 12, so very low. It can be set between 6 and 12 and may be barely perceivable: this is not a fault, but quite normal for the program.
3. **Ionophoresis pulse:** the intensity must be strong enough to produce a relevant perception, near pain, till the muscles surrounding the area treated begin to contract. Maximum adjustable intensity: 50.
4. **EMS impulse:** in this case the intensity is raised a little at a time to stimulate and gradually increase the metabolism of the treated muscle. A comparison could be drawn with a car: the engine needs to warm up before it can be run at maximum speed.
5. **Toning, training, atrophy contraction impulse:** the muscle treated must visibly contract during a training impulse. The fact that the muscle tends to stiffen and increase in volume will be visible to the naked eye. Intensity should be increased gradually (in the first contraction) to enable you to identify the right level of stimulation comfort. Intensity can be increased up to the personal tolerance

threshold during the second training contraction; this operation is then repeated during each contraction until the workload reaches the level of intensity recommended in the description of the single programs. We recommend that you record the level of intensity reached in order to try to improve the level of stimulation and consequently your performance.

6. **Massage, winding down, active recovery impulse:** the intensity must be adjusted gradually to massage the treated muscle. The level of intensity should be sufficient to obtain a comfortable massage. Bear in mind that there is no need to endure high levels of intensity in this case as it is meant to be a massage, meaning that intensity can be increased gradually and not to an excessive degree.
7. **Capillarisation impulse:** increase the intensity gradually to produce constant, visible stimulation of the area treated; a medium stimulation threshold is recommended, always below the pain threshold.
8. **Lipolysis/drainage impulse:** the "pump" effect is produced by sequential tonic contractions. The intensity must be sufficient to produce these contractions: the greater the contraction, the greater the induced pump effect. There is no benefit to be gained from enduring intensity high enough to cause pain. The first electrostimulation sessions should be carried out at a low intensity to allow the organism to get used to new sensations. In this way intensity can be increased gradually without causing any trauma.
9. Other impulse: see program description.

Contraindications

Do not use the device when there are cancerous lesions in the area of treatment. Stimulation must not be carried out in areas that are infected, swollen or inflamed, or when there are skin eruptions (phlebitis, thrombophlebitis, etc.).

It is forbidden to use I-TECH PHYSIO4 and PHYSIO EMG if the patient has a pacemaker, is cardiopathic, suffers from epilepsy, is a pregnant woman, is an anxious person, has severe disease, has inguinal or abdominal hernias. Do not use the device if the source of the pain is unknown or not diagnosed. **Use the device ONLY after having a diagnosis.** In the event of injury, muscle stress or

any other health problem consult your doctor before using the device and only use it under medical supervision.

Side effects

No significant side effects are known. In some cases of particularly sensitive people, skin redness occurs at the electrodes after treatment: the redness normally disappears few minutes after treatment. If the redness persists, consult a doctor.
In some rare cases evening stimulation causes some difficulties in falling asleep. In this case, suspend the treatment and consult a doctor.

Warnings

Treatment efficacy depends on the patients' selection by qualified persons. ***The long term effects of a chronic stimulation are unknown.***

The device has been designed and manufactured to be operated exclusively with the internal rechargeable batteries and the charger present in the kit.
It is recommended:

- to control position and meaning of all the labels on the equipment;
- not to damage the connection cables to the electrodes and to avoid winding the cables around the device;
- to avoid the use of the device by persons who did not read carefully this manual. Keep the device away from children;
- not to wear metal objects during treatment;
- to use the electrodes on clean and dry skin. When using the electrodes, follow the instructions given in the manual and on the package of the electrodes. Use only single-patient electrodes, supplied exclusively by the manufacturer, and take care to avoid the exchange of electrodes between different users. I-TECH PHYSIO4 and I-TECH PHYSIO EMG has been tested and guaranteed for the use only with the electrodes supplied by the manufacturer;
- to use ONLY accessories supplied by device manufacturer. **Only use battery chargers supplied by the manufacturer**; the use of battery chargers not supplied by the manufacturer will free the

same from any responsibility related to damage to the equipment or user and will expose the user to risks such as short circuits and fire.

It is forbidden:

- to use the device in the presence of patient monitoring equipment, of electrosurgical (possible bruises and burns) or shortwave or microwave therapy equipment or other equipment that sends electrical impulses into the body and in general in combination to other medical devices, since it could cause problems to the stimulator;
- to use the device by persons known to be unsound-minded, or suffering from sensibility disorders, permanently or temporarily disabled unless assisted by qualified personnel; the use by people with low IQ;
- to use the device close to flammable substances/gas/explosives, in environments with high concentrations of oxygen, with aerosol-therapy devices or in wet environments (use of the device is prohibited in bathroom or shower areas or while showering/bathing);
- to use the device in presence of signs of deterioration of the device itself, cables and/or electrodes: please contact the dealer or the manufacturer following the instructions given in the paragraph *Support.* Control carefully the integrity of the device before each use;
- to use the device while driving or during the operation and control of equipment/machinery.
- to position the electrodes in such a way that the current crosses the heart area (e.g. a black electrode on the chest and a red electrode on the shoulder blade); however, electrodes can be positioned along the muscular fascia of the heart area, as used for pectoral strengthening. Danger of heart arrythmia;
- to position the electrodes close to the eyes; make sure that the current delivered does not cross the eyeball (one electrode diametrically opposite to the other in relation to the eye); keep a distance of at least 3 cm from the eyeball;
- ***to position the electrodes on the carotid sinuses (carotid), in particular in patient with a well known sensibility on reflection***

of the carotid sinuses; to position the electrodes near genitals and in those areas that have poor sensibility;

- ***to simulate the thyroid or apply stimulation on the neck and mouth, as this stimulation could case important muscle spasms that can obstruct the airways, creating difficulty in breathing and problems with the heart rhythm and blood pressure;***
- to use pointed or sharp objects on the device keyboard.

Attenzione:

- keep right distance between electrodes: the contact between electrodes could cause wrong stimulations or irritations/burns;
- do not use damaged electrodes even if they well adhere to the skin;
- to the integrity of the plug and the casing of the battery charger. If any signs of deterioration appear in any of these parts, stop using the battery charger immediately and contact the retailer or manufacturer;
- care should be taken for use in patients with suspected heart problems;
- ***stimulation intensity and electrodes position should be suggested by the prescriber doctor***;
- be sure that the electrodes well adhere to the skin. Cases of skin irritation persistent even hours after treatment may occur in the area of application of the electrodes after prolonged use of the same;
- do not mix connection cables up with earphones or other devices and do not connect the cable to other equipment;

The manufacturer considers himself responsible for the performances, reliability, safety and security of the device only if:

- any addition, modification and/or repair are carried out by autorized personnel;
- the instructions for use contained in this manual are strictly followed.

Should any foreign materials penetrate the device contact the retailer or manufacturer immediately. If dropped down, check that the housing is not cracked or damaged in any way; if so, contact the retailer or manufacturer.

Should you notice any changes in the device's performance during treatment, interrupt the treatment immediately and consult the retailer or manufacturer.

If the stimulation is uncomfortable decrease intensity. If the problem persists consult a doctor.

Some patients could suffer from skin irritation or oversensitivity due to stimulation or gel. If the problem persists, suspend the stimulation and consult a doctor.

Consult a doctor before using I-TECH PHYSIO4/EMG with metallic osteosynthesis devices.

IF YOU HAVE ANY DOUBTS REGARDING THE DEVICE USE CONSULT YOUR DOCTOR.

Patient preparation

Before using I-TECH PHYSIO 4/EMG clean the skin of the area to be treated; with the cable disconnected from I-TECH PHYSIO 4/EMG, connect the electrostimulation cable jacks to the self-adhesive electrodes; position the self-adhesive electrodes on the skin (see photos of electrode positions in the *Positions manual*); connect both cables to the relative jacks CH1/CH2 or CH3/CH4 (the software, for safety, requires the connection of all therapy cables) for each program selected the display will show the active channels and the type of cable to be inserted (refer to the table below).

Type of cable	Program
TYPE 1	From W01 to W26 From R01 to R25 From E01 to E17 From M01 to M18
TYPE 2	W27
TYPE 3	C01

The type of cable is screen-printed on each cable connector as shown in the photo:

Figure 1 – Cable type.

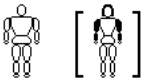
Make sure that I-TECH PHYSIO4/EMG is switched off **before disconnecting the electrodes** at the end of the treatment.

Device use

Instructions on use for a single patient

1. Turn on I-TECH PHYSIO 4/EMG by pressing **ON/OFF** button on the small rear panel of the device.
2. Select single mode and press the OK key to confirm.
3. Select the program group: Wave, Rehab, EMS or MEM, using the right and / or left arrow keys.
4. Select the program using the up/down arrow buttons (e.g.E03 basic strength).
5. Select male or female with the right / left arrow keys (when applicable).

Select male



Select female

6. Select the muscle group with the up/down buttons.

arms male

trunk male

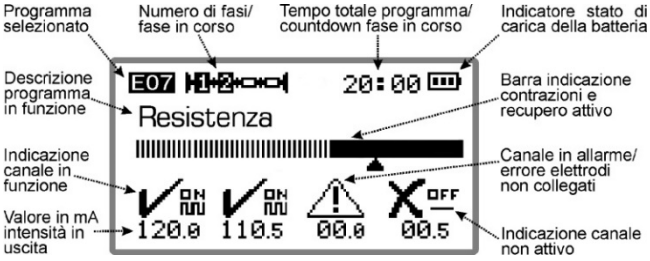
Legs male

arms female

trunk female

legs female

7. Press the OK key to start stimulation and the relative text appears on the screen; place the electrodes on the skin, connect the cables, and increase the intensity; the type of cable required for the selected type of treatment also appears on the screen. To start the work session, press the Up arrow key of at least one of the channels used for electrostimulation, and increase the intensity of the output current; the I-TECH PHYSIO 4/EMG opens the work screen automatically, displaying the name of the selected program.
8. Press the up arrow button for each channel in use to increase current intensity until the personal tolerance level is reached (stimulation comfort).



A bar indicating the start and end of a contraction will appear on the display while the electronic stimulator is working. The periods of muscular contraction (bold bar) and the periods of recovery (dotted or striped bar) are graphically visualized under the bar with a cursor. This enables the user to know exactly when a contraction starts.

9. At the end of the first phase, I-TECH PHYSIO 4/EMG At the end of the first phase, the I-TECH PHYSIO 4/EMG cancels the previously selected intensity, and warns the user with an intermittent signal; to continue with the program, increase the intensity again. Three sound signals will advise of the end of the program. At the end of the program, switch off the I-TECH PHYSIO 4/EMG and remove the cables. Attach the electrodes to the transparent films and put them in their original packaging

Option to simultaneously increase the intensity on all 4 channels

Select the desired program as instructed above.

Increase the intensity of all the channels up to at least 1 by pressing the relative keys, and then press the Up arrow keys to increase the intensity for all 4 channels. To decrease the intensity, press the Down arrow keys.

Skip phase control

Press the right arrow button during normal program operation to skip to the next phase.

Pause / stop program control

During normal program operation, press the OK button once to momentarily pause the normal work cycle. Press the OK button again to restart the program.

Press the OK button twice consecutively to stop the program.

Instructions on use for two patients

1. Turn on I-TECH PHYSIO 4/EMG by pressing the **ON/OFF** button on the small rear panel of the device.
2. Select the two patient mode and press the OK key to confirm.
3. Next, select the program required for patient 1 following the instructions above.
4. Press key 2 to set the program and make the relative adjustments for patient 2.

During therapy, it is possible to switch between patient 1 and patient 2 at any time by pressing key 1 or 2 on the keyboard.

ATTENTION: In this mode, the cable recognition by software does not take place, be particularly careful when using the correct cables for each type of program (see *Figure 1 - Cable type*).

Indications for use of electrotherapy

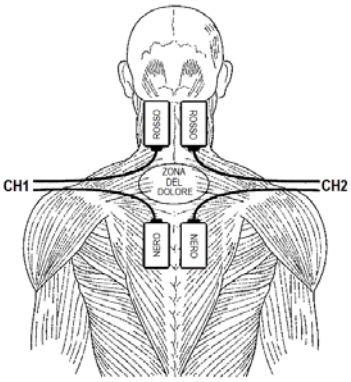
Wave programs

ATTENTION! It must be remembered that an electronic stimulator is a very effective analgesic instrument and that pain can indicate various types of medical condition. Most of the programs described in this section are analgesic. You are advised to read the ENTIRE manual carefully before using I-TECH PHYSIO 4/EMG.

TENS, an acronym standing for *Transcutaneous Electrical Nerve Stimulation*, is a therapeutic technique mainly used for analgesic purposes to counter the effects (usually pain) of a wide variety of medical conditions. For this purpose, it finds application in treating everyday ailments troubling mankind: neck pain, arthrosis, myalgia, neuritis, back pain, periarthritis, heaviness in legs, muscle weakness, just to mention a few.
On an academic level, TENS can be divided into various categories according to the mechanism used to reduce the pain. The main types are: conventional TENS (or fast analgesic), training TENS (or delayed analgesic), which is similar to the effect of the electro acupuncture, TENS scan where the stimulation parameters are changed during the treatment, TENS at maximum values with antidromic action and consequently an immediate

local anaesthetic effect, TENS burst which is a mix of the first two types of TENS.
The rehabilitative action of TENS is represented by its power to reduce pain thereby restoring physiological conditions; most of the time this allows the patient to regain normal motor function. Consider a patient suffering from irritating periarthritis; the patient usually resorts to use analgesics or learns to live with the pain, which often makes even the simplest movements impossible. Immobility reduces metabolic activity making it impossible to eliminate allogenic substances. So, a vicious circle begins. In addition to relieving pain, TENS causes induce muscle stimulation increasing metabolic activity and blood flow and improving tissue oxygenation with an intake of nutritional substances. Therefore, the positive effect can be amplified by combining TENS with muscle stimulation of the area concerned.

Electrodes' positioning and intensity levels



IMPORTANT
Create a square area with the electrodes over the painful zone. Keep 4cm minimum distance between the electrodes.

Figura 2 – Electrodes' positioning.

The electrodes should be positioned to form a square over the painful zone by using the channel 1 and channel 2 as shown above in *Figure 2* (positioning of the red electrode at the top/black one at the bottom is irrespective of the type of therapy, refer to the *Positions manual*). The intensity should be adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the treated area begin to contract; over this limit

the stimulation does not become more effective, just more irritating, so it is best to stop before that point.

Specific programs

Progr.	Medical Prog. Yes/NO	Description	PHASE 1
W01	Yes	Rapid TENS	Total time 30min Frequency 90Hz Impulse width 50µS
W02	Yes	Endorphinic TENS 0,5Hz	Total time 20min Frequency 0,5Hz Impulse width 200µS
W03	Yes	Endorphinic TENS 1Hz	Total time 20min Frequency 1Hz Impulse width 200µS
W04	Yes	Endorphinic TENS 2Hz	Total time 20min Frequency 2Hz Impulse width 200µS
W05	Yes	TENS Scan	Total time 20min Frequency 90/70/90/110Hz To scan of 1min
W06	Yes	TENS at maximum values	Total time 3min Frequency 150Hz Impulse width 200µS
W07	Yes	TENS Burst	Total time 15min Frequency 2Hz Impulse width 80µS Burst train
W08	Yes	Microcurrent	Total time 30min Frequency 90Hz Impulse width 20µS
W09	Yes	Ionophoresis 1	Total time 20min Frequency 1000Hz Impulse width 100µs (intensity limited to 50 steps)
W10	Yes	Ionophoresis 2	Total time 20minuti

Progr.	Medical Prog. Yes/NO	Description	PHASE 1
			Frequency 1500Hz Impulse width 100µs (intensity limited to 50 steps)
W11	Yes	Haematomas	Total time 20min Pulses for hematomas
W12	Yes	Oedema	Total time 15min
W13	Yes	Diadynamic 1 (MF)	Total time 15min
W14	Yes	Diadynamic 2 (MFSR)	Total time 15min Frequency 2s ON, 1s OFF
W15	Yes	Diadynamic 3 (MFSL)	Total time 15min Frequency 5s ON, 2s OFF
W16	Yes	Diadynamic 4 (DF)	Total time 15min
W17	Yes	Diadynamic 5 (DFSR)	Total time 15 min Frequency 2s ON, 1s OFF
W18	Yes	Diadynamic 6 (DFSL)	Total time 15min Frequency 5s ON, 2s OFF
W19	Yes	CP current	Total time 20min A 3s waveform and another 3s in a continuous sequence
W20	Yes	LP current	Total time 20min A 10s waveform and another 5s in a continuous sequence
W21	Yes	HVPC	Total time 15min
W22	No	Kotz Current	Total time 10min
W23	No	Neofaradic 20Hz	Total time 15min and 33s
W24	No	Neofaradic 50Hz	Total time 15min and 33s
W25	No	Neofaradic 100Hz	Total time 15min and 33s
W26	Yes	Interferential	Total time 15min

W01 • Rapid TENS (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

Program also called **conventional TENS**, used for analgesic purposes; its purpose is to induce the organism into blocking pain at the spine, in accordance with the "Gate Control Theory" by Melzack and Wall. Pain

impulses leave part of the body (for example the hand) and run along the nerve tracts (through small-diameter nerve fibers) until they reach the central nervous system where the impulses are interpreted as pain. Conventional TENS activates large-diameter nerve fibers, blocking the path of small-diameter nerve fibers at the spine. It therefore acts mainly on the symptom: to simplify it further, the wire transmitting pain information is obstructed.
Conventional TENS is a current that can be used to treat **general everyday pain**. The first benefits can be seen after an average of 10/12 treatments carried out on a daily basis (there are no contraindications for up to double this amount).
The program can be repeated at the end of the session for particularly persistent pain.
Session duration: 30 minutes (no less than 30/40 minutes).
Electrodes' positioning: form a square above the painful area as shown in ***Errore. L'origine riferimento non è stata trovata.***.
Intensity: adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract (over this limit stimulation does not become more effective, just more irritating, so it is best to stop before that point).

W02 • Endorphinic TENS 0,5 Hz Frequency (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This type of stimulation produces two effects in relation to the position of the electrodes: positioning the electrodes in the dorsal region, see photo 08 in the *Positions manual*, promotes the endogenous production of morphine-like substances capable of raising the pain perception threshold; positioning the electrodes to form a square above the painful area as shown in *Figure 2* produces a vascularizing effect. Vascularization increases arterial flow and consequently aids the removal of allogenic substances and helps to restore normal physiological conditions.
Session duration: 20 minutes, daily frequency.
Electrodes' positioning: photo 08 of the *Positions manual* or like in *Figure 2*,do not position the electrodes close to inflamed areas.
Intensity: to be adjusted in order to have a good solicitation of the simulated part (15÷30mA), the sensation must be similar to a massage.

W03 • Endorphinic TENS 1 Hz Frequency (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Like the previous one with 1Hz frequency.

W04 • Endorphinic TENS 2 Hz Frequency (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Like the previous one with 2Hz frequency.

W05 • TENS Scan (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
The action of this program is very similar to that of the W01 program. During stimulation, this program modifies the frequency and impulse width in order to prevent inurement to the stimulation (no need to continuously adjust the intensity value). Select the intensity at the beginning of the program and maintain it until the end of the program: set it in order to produce a slight tingling effect in the treated area. If the perception of current decreases a lot during the program, do not increase the intensity value and wait until the end of therapy. The TENS program is working properly.
Session duration: 20 minutes.
Electrodes' positioning: form a square above the painful area as shown in *Figure 2* or refer to photos 25 to 33 of the *Position Manual*.
Intensity: just above the perception threshold.

W06 • TENS at maximum values (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This type of stimulation is suitable for injuries or bruises when rapid action is required. The intensity selected is the maximum tolerable value (well in excess of conventional tens, and therefore with considerable contraction of the muscles surrounding the area treated). That is the reason why such stimulation is undoubtedly the least tolerated but is extremely effective. This type of stimulation is not recommended for particularly sensitive people and in any case the electrodes should not be positioned in sensitive areas such as the face and genitals or close to wounds.
Session duration: very short, 3 minutes.
Electrodes' positioning: form a square above the painful area as shown in *Figure 2* or refer to photos 25 to 33 of the *Position Manual*.

Intensity: it is the maximum tolerable value (well in excess of conventional tens, and therefore with considerable contraction of the muscles surrounding the area treated).

W07 • TENS Burst impulse (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This program produces a training effect using the frequencies of conventional TENS. Useful for pain therapy. The action is similar to the one of endorphinic TENS program.
Session duration: 15 minutes.
Electrodes' positioning: form a square above the painful area as shown in *Figura 2*.
Intensity: adjusted to produce a good stress on the stimulated part (15÷30mA), the sensation must be similar to a massage.

W08 • Microcurrent (MENS – Milli Ampere Electrical Nerve Stimulation) (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**) active channels: CH1.
The MENS releases a very low and barely perceivable current. The main properties of the MENS are:

- correct body bioelectrical currents when they have been altered by diseases;
- analgesic action;
- production of ATP (the production of ATP promotes the synthesis of proteins and faster healing of wounds);
- reduction of oedema: MENS is able to reduce vascular permeability with an improvement in lymphatic activity.

It is a program suitable for very sensitive areas (face, close to genitals, inflamed areas) for people that don't tolerate conventional TENS very well.
Session duration: 30 minutes.
Intensity: maximum limited to 12. We recommend an intensity level between 6 and 12.

Table of correspondences set intensity / effective current:

Intensity set on the display	Effective current
0,5	0,15 mA

Intensity set on the display	Effective current
1	0,30 mA
3	0,90 mA
5	1,5 mA
9	2,7 mA
12	3,6 mA

Ionophoresis

For the ionophoresis programs the stimulation **intensity** shall be adjusted **so as to feel a remarkable tingling in the treated area**, producing a slight contraction of the surrounding muscles. If you feel discomfort (or pain), reduce the intensity and eventually stop the therapy.

The ionophoresis treatment exploits the polarity (negative or positive) that characterizes a specific drug, selected on the basis of the therapy to be conducted. When this drug is applied to the electrodes and the treatment starts, the issued current by the electrodes acts in such a way as to convey the drug's ions from one electrode (also called polo) to the other, therefore as to cross the location affected by the disease and then release the specific active ingredient.

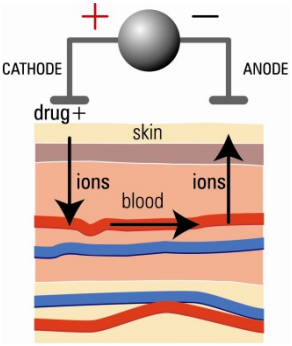


Table of the main drugs used in the iontophoresis treatments			
Drug	**Polarity**	**Prevalent action**	**Indications**
Calcium chloride (Sol. 1%-2%)	Positive	Sedative and ricalcifyc	Osteoporosis, spasmofilia, algodystrophic syndrome. Do not use in case of arteriosclerosis
Magnesium chloride (Sol. 10%)	Positive	Analgesic, sedative, fibrolytic	Calcium chloride substitute in patients with

Table of the main drugs used in the iontophoresis treatments			
Drug	**Polarity**	**Prevalent action**	**Indications**
			arteriosclerosis
Potassium iodide	Negative	Sclerolytic, emollient	Scars, Dupuytren's disease, keloids
Acetylsalicylate lysine	Negative	Analgesic	Arthrosis
Flectadol, Aspegic	Negative	Analgesic	Extra / intra articular arthrosis, rheumatism
Local anesthetics (novocaine, lidocaine)	Negative	Analgesic	Local anesthesia, trigeminal neuralgia
Benzidamina	Positive	Analgesic	Rheumatoid arthritis
Diclofenac sodium	Pos/Neg	Analgesic	hematoma
Orudis, Voltaren, Lometacen, Arfen, Tilcotil, Axera, Naprosyn	Negative	Anti-inflammatory	Degenerative and extra articular rheumatism, gout
Piroxicam, Feldene	Positive	Analgesic	Fractures
Sodium salicylate (1%-3%)	Negative	Analgesic	Articular rheumatism, myalgia
Ketoprofen, lysine salt	Pos/Neg	Anti-inflammatory	Osteoarthritis, arthritis
Thiomucase	Negative	Anti-oedemic	Post-traumatic and post-operative edema due to venous insufficiency.

If the prescribed drug does not appear on the above list, check the polarity indicated on the package or on the warnings of use of the drug itself or consult your doctor / pharmacist.

Before starting the ionophoresis session, clean the skin near the area to be treated; connect the jacks of the electrostimulation cable to the black rubber electrodes with cable disconnected from I-TECH PHYSIO.

Moisten the two sponge electrodes abundantly.

ATTENTION: wring the sponge electrodes to avoid dripping, then put the drug on an electrode as follows:

- drugs with positive polarity: dissolve this type of drug on the electrode connected to the positive pole (red connection, cathode).
- drugs with negative polarity: dissolve this type of drug on the electrode connected to the negative pole (black connection, anode).
- Bipolar drugs: these can be dissolved on either the positive pole or the negative pole.

At this point, insert the two black rubber electrodes, previously connected to the electrostimulation cable inside the sponge coverings (one with the drug and the other without). Position the electrode with the drug on the painful area, and the other electrode on the other side (*Figure 3*) with the help of the elastic band supplied with the kit. Connect both cables at the appropriate jack (channel 1 or channel 2, choose both channels only if you want to stimulate two different areas) and turn I-TECH PHYSIO 4/EMG on. If you wish to double the number of electrodes, you can request an additional ionophoresis kit by contacting directly the Manufacturer.

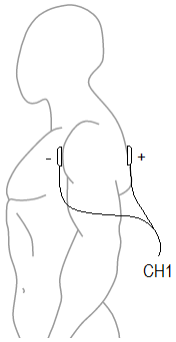


Figure 3 – Positioning of electrodes placed at the ends of the muscle to be stimulated.

It is possible to find a slight reddening of the skin at the end of the program; the redness normally disappears a few minutes after the end of the program.

ATTENTION. Do not use the iontophoresis program in proximity of metal prostheses.

Ionophoresis is also used for the treatment of diseases affecting the urogenital male apparatus, like IPP (Induratio Penis Plastica) or La Peyronie disease.

It is recommended to consult your specialist or treating physician before starting treatment.

Contact the manufacturer for other information.

W09-W10 • Iontophoresis 1/Iontophoresis 2 (medical programs)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
At the end of the program, the skin could turn slightly red; any reddening usually vanishes a few minutes after the end of the program. Select channel 1 or channel 2 (select both channels only if you need to stimulate two different areas).

Channels 3 and 4 are disconnected.

W09 and W10 programs differ only in terms of the level of frequency. W09 program works with a frequency of 1000Hz, while the second with a frequency of 1500Hz. On the other hand, this aspect can cause greater irritability of the skin. In the case of the W10 program, it is advisable to check for reddening of the skin 5 minutes into treatment (stop the program and remove the electrodes to check the skin): in the case of excessive reddening, use program W09 instead.
Session duration: 20 minutes.
Electrodes' positioning: transversally to the area to be treated: place the electrode with the drug over the painful area and the other transversely.
Intensity: such as to produce a strong tingling in the treated area.

W11 • Haematomas (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Consult a doctor before using this program to treat haematomas. Few applications carried out within a few hours of the bruise are recommended. A combination of various types of square-wave impulses has a graduated draining effect on the area to be treated, in fact impulses at different frequencies drain the area at different depths.
Session duration: 20 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.
Intensity: to be adjusted between the threshold of perception and pain.

W12 • Oedema (medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

Consult a doctor before using this program to treat oedemas. A combination of various types of square-wave impulses has a graduated draining effect on the area to be treated (impulses at different frequencies drain the area at different depths).

Session duration: 15 minutes.

Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.

Intensity: should be adjusted to a level between the thresholds of perception and pain.

Diadynamic currents

Diadynamic currents are composed of waves with unidirectional and always positive impulses. These kind of waves derive from electrical sine waves (low frequency) that have been previously combined and modulated.

Diadynamic currents are indicated for the treatment of tendinitis (of the elbow, wrist, shoulders, knee and ankle), articular traumas, acute and chronic articular diseases and muscular pains.

W13 • MF Diadynamic – MonoPhase (medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous.

Indication: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles.

Session duration: 15 minutes.

Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.

Intensity: to be adjusted between the threshold of perception and pain.

W14 • MFSR Diadynamic – Mono-Phase Quick Syncopation (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause, with 2 seconds of action and a 1 second pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous.

Indication: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles.

Session duration: 15 minutes.

Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.

Intensity: to be adjusted between the threshold of perception and pain.

W15 • MFSL Diadynamic – Mono-Phase Slow Syncopation (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause, with 5 seconds of action and a 2 second pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous.

Indication: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles.

Session duration: 15 minutes.

Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.

Intensity: to be adjusted between the threshold of perception and pain.

W16 • DF Diadynamic – DiPhase (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

It is a sinusoidal single-phase current with pulse trains of 10ms and a 0ms pause at 100 Hz. Current sensibility is of course lower than MF Diadynamic thanks to its higher frequency. So its passage is more pleasant and less perceived. Physiological effects: The main action of the DF current is reduced sensibility that provokes an analgesic effect. However, the inhibitory action is hindered by rapid inurement. Moreover, it causes

vasodilatation, has a sedative effect on the sympathetic nervous system and a great effect of functional and motor recovery of the muscle.
Indication: it is indicated for the therapy of painful states of non-spastic origin, to improve the tone of the connective tissue of muscles.
Session duration: 15 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.
Intensity: to be adjusted between the threshold of perception and pain.

W17 • DFSR Diadynamic – DiPhase Quick Syncopation (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
It's a diadynamic biphasic current with 2 seconds of action and a 1 second pause at 100 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous.
Indication It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles.
Session duration: 15 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.
Intensity: to be adjusted between the threshold of perception and pain.
W18 • DFSL Diadynamic – DiPhase Slow Syncopation (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
It is a diadynamic biphasic current with 5 seconds of action and a 2 second pause at 100 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous.
Indication: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles.
Session duration: 15 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.
Intensity: to be adjusted between the threshold of perception and pain.

W19 • CP Current – Short period (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

It is composed of alternated single-phase (3 seconds) and biphasic (3 seconds) waveforms. The short term current has an essentially dynamogenic effect. This action promotes contraction of the striated muscles, improves the nutritional status of the tissue and facilitates the re-absorption of post-traumatic oedemas. Frequency alternating current is clearly perceptible: the DF current produces a light tremble while the MF current produces a strong pulsation.

Physiological effects: This kind of current has a strong dynamogenic effect (or trophic effect) and a great analgesic effect, especially in the case of chronic pain. Moreover, the CP current is particularly effective with regard to the re-absorption of haematomas and oedemas.

Indications: It is used in the short term to treat pain resulting from the inflammation of tendons, articular capsule and soft tissues (tendinitis, bursitis, rheumatoid arthritis and trauma in general). Session duration: 15 minutes.

Electrodes' positioning: form a square above the area to be treated as shown in *Figure 2*.

Intensity: to be adjusted between the threshold of perception and pain.

W20 • LP Current – Long Period (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

It is composed of alternated single-phase (10 seconds) and biphasic (5 seconds) waveforms. The long term current has essentially an inhibiting action on muscle and sensibility: as a consequence it produces analgesia and relaxation of the striated muscles.

Session duration: 15 minutes.

Electrodes' positioning: : form a square above the area to be treated as shown in *Figure 2*.

Intensity: to be adjusted between the threshold of perception and pain.

W21 • HVPC – High Voltage Pulsed Current (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

HVPC can be used for the reconstruction of tissue, the re-absorption of oedemas and the reduction of pain.

For repairing tissue, place a sterile gauze dampened with a saline solution on the wound: if the anode (positive electrode) is placed over the wound,

the migration of vascular cells and the synthesis of collagen occur, increasing the speed of recovery. If the cathode (negative electrode) is placed over the wound, a bactericide effect occurs and the growth of pathogenic microorganisms is delayed.
Session duration: 15 minutes.
Electrodes' positioning: : form a square above the area to be treated as shown in *Figure 2*.
Intensity: to be adjusted between the threshold of perception and pain.

W22 • Kotz Current (non-medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
The Kotz current was discovered by Y. M. Kotz in the 1970s. It is a middle-frequency current and is used for the strengthening of normally innervated muscle. A 2.5 kHz interrupted carrier current is used. It is characterised by 10ms packages with 10ms pauses in between; therefore 50 packages of impulses are supplied per second. The program consists of 10 seconds of stimulation (with the aforementioned parameters) and 20 seconds of rest. Total program duration: 10 minutes. The Kotz excitomotor effect occurs in deep muscles because of their lower resistance. In fact it has been demonstrated that the electrical impedance skin decreases with an increase in frequency.
Active channels: CH1 and CH2.
Session duration: 10 minutes, one phase.
Electrodes' positioning: refer to photos from 01 to 22 of the *Position Manual*.
Intensity: adjusted in order to produce good contractions of muscles stimulated at the pain threshold. Maximum adjustable intensity: 50. The intensity is adjustable only during the 10 seconds of the supply of impulses and not during the OFF phase.

Neofaradic current

The neofaradic current is used for the stimulation of normal innervated muscle. It is suitable for treating muscular hypotrophy, and the contraction of muscles also has a positive effect on bones and articular circulation.
Duration: the W23, W24 and W25 programs are composed of 2 phases:

- The first phase lasts 33 seconds and is for selecting the intensity of contraction. When the desired level is reached, press the RIGHT ARROW key to confirm. Next, press the intensity increase key of

any channel: phase 2 will begin automatically at the selected intensity (90% first turn, 95% second turn, 100% third turn).

- The second phase lasts 15 minutes and it alternates 10 seconds of recovery with 5 seconds of contraction.

W23 • Neofaradic 20Hz (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

It is a low frequency (20 Hz) current that is used to produce individual muscular contractions. It consists of 5 seconds of stimulation and a 10 second pause.

Session duration: 15 minutes and 33 seconds: first phase test 33s, second phase of work 15 minutes.

Electrodes' positioning: photos from 01 to 22 of the *Position manual.*

Intensity: adjusted for good contraction of the muscles stimulated.

W24 • Neofaradic 50 Hz (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

It is a middle frequency current (50 Hz) used to obtain muscular tetanus; it consists of 5 seconds of stimulation and a 10 second pause.

Session duration: 15 minutes and 33 seconds: first phase test 33s, second phase of work 15 minutes.

Electrodes' positioning: photos from 01 to 22 of the *Position manual.*

Intensity: : adjusted in order to produce good contractions of muscles stimulated almost at the pain threshold.

W25 • Neofaradic 100 Hz (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

It is a high frequency current (100 Hz) used to obtain muscular tetanus; it consists of 5 seconds of stimulation and a 10 second pause.

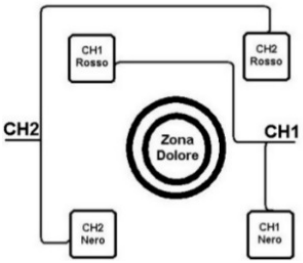
Session duration: 15 minutes and 33 seconds: first phase test 33s, second phase of work 15 minutes.

Electrodes' positioning: photos from 01 to 22 of the *Position manual.*

Intensity: adjusted in order to produce good contractions of muscles stimulated at the pain threshold.

W26 • Interferential (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)



The interferential therapy is based on the interference of two sinusoidal currents at different frequencies applied to the patient; the resultant current, endogenously generated, is a new kind of current. Its frequencies are respectively the difference and the sum of the two initial frequencies and their multiples. There are several advantages to this current: easy transfer through the skin, no sensation of pain for the patient, an excellent therapeutic effect in depth, no electrolytic effects.

Session duration: 15 minutes, one phase.

Electrodes' positioning: as shown in the diagram beside.

Intensity: adjusted in order to produce a good tingling, not painful.

W27 • Ione generator CC (medical program)

Cable type: TYPE 2 (see** Errore. L'origine riferimento non è stata trovata.**)

active channels: CH1 CH3

The program generates a continuous current which is the classic waveform used for the ionophoretic treatments, being capable to maximize the ion transport. See what is described in programs W09 and W10 regarding the principles of action. It is possible to find a slight reddening of the skin at the end of the program; the redness normally disappears within an hour of the end of the program.

Session duration: 20 minutes.

Electrodes' positioning: transversally to the area to be treated: place the electrode with the drug over the painful area and the other transversely.

Intensity: such as to produce a strong tingling on the treated area.

REHAB programs

Prg	Medical Prog. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
R01	Yes	Denervated	Total time 20min		
R02	Yes	Partially denervated	Total time 25min		

Prg	Medical Prog. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			Wave with 3s ramp up e 3s ramp down		
R03	Yes	Stress incontinence	Total time 3min Frequency 8Hz Pulse width 150µs	Total time 10min (3Hz-150µs x 9s + 50Hz-150µs x 6s) x 40 cycles	
R04	Yes	Urgency incontinence	Total time 3min Frequency 8Hz Pulse width 150µs	Total time 10min Frequency 12Hz Pulse width 150µs continuous	
R05	Yes	Mixed incontinence	Total time 3min Frequency 8Hz Pulse width150µs	Tempo tot 10min (3Hz-150µs x 9s + 20Hz-150µs x 6s) x 40 cycles	
R06	Yes	Anti - inflammatory	Total time 30min Frequency 90Hz Pulse width 60µs		
R07	Yes	Neck pain/Headac he	Total time 30min Frequency 90Hz Pulse width 60µs	Total time 3min Frequency 2Hz Pulse width 200µS	
R08	Yes	Backache/	Total time	Total time 5min	

Prg	Medical Prog. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
		Sciatic pain	30min Frequency 90Hz Pulse width 60µs	Frequency 2Hz Pulse width 80µs Burst train	
R09	Yes	Sprains/ Bruises	Total time 15min Frequency 90Hz Pulse width 60µs	Total time 15min Pulses for hematomas	
R10	Yes	Hand/wrist pain	Total time 15min Frequency 70Hz Pulse width 60µs	Total time 15min Frequency 90Hz Pulse width 50µs	Total time 10min Frequency 110Hz Pulse width 40µs
R11	No	Plantar stimulation	Total time 15min Frequency 70Hz Pulse width 60µs	Total time 15min Frequency 2Hz Pulse width 150µs	Total time 10min Frequency 90Hz Pulse width 50µs
R12	Yes	Epicondylitis	Total time 20min Frequency 90Hz Pulse width 40µs	Total time 10min Frequency 70Hz Pulse width 60µ	Total time 10min Frequency 50Hz Pulse width 90µ
R13	Yes	Epithroclea	Total time 20min Frequency 90Hz Pulse width	Total time 20min Frequency 70Hz Pulse width 60µs	

Prg	Medical Prog. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			40µs		
R14	Yes	Periarthritis	Total time 1min Frequency 150Hz Pulse width 200µs	Total time 30min Frequency 90Hz Pulse width 60µ	Total time 10min (3Hz-200µs x 7s +1Hz-200µs x 3s+ 30Hz-200µs x 5s) x 40 cycles
R15	Yes	Neuralgias	Total time 30min Frequency 90Hz Pulse width 30µs		
R16	Yes	Mestrual pain	Total time 30min Frequency 90Hz Pulse width 60µs	Total time 5min Frequency 2Hz Pulse width 80µs Burst train	
R17	Yes	Carpal tunnel	Total time 3min Frequency 90Hz Pulse width 50µs		
R18	Yes	Tendinitis	Total time 20min with limitation I_{max} a 3,6mA		
R19	Yes	Strain	Total time		

Prg	Medical Prog. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			20min with limitation I_{max} a 3,6mA		
R20	Yes	Muscular tears	Total time 20min with limitation I_{max} a 3,6mA		
R21	Yes	Herpes Zoster	Total time 30min Frequency 70Hz Pulse width 20µS		
R22	Yes	Wound/healing	Total time 15min		
R23	Yes	Wounds/bactericide	Total time 15min		
R24	Yes	Venous insufficiency	Tempo tot 60min (0,5Hz x 1min + 1Hz x 1min + 2Hz x 30s) x 24 cycles		
R25	Yes	Superficial osteogenesis	Total time 90min		

The indications of the electrodes' positioning are available in the *Positions manual*.

R01 • Denervated (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**) channel active: CH1 CH3.

This program is specifically indicated for the treatment of denervated muscles, i.e. with complete rupturing of the peripheral nerve. In this case it is not possible to stimulate the muscle through its nerve fibres: it is

necessary, instead, to stimulate the muscle fibres directly. Impulses have a longer duration (calculated in milliseconds and not in microseconds as in the case of normal innervated muscle) and a much lower frequency.
Session duration: 20 minutes, in one phase.
Electrodes' positioning: use 2 large electrodes, better if wet and in sponge, placed at the heads of the muscle to be stimulated.
Intensity: should be adjusted to stimulate the muscle with a short contraction every 2 seconds.

R02 • Partially denervated (medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
This program is specifically indicated in case of partially denervated muscles, i.e. with a partial injury of the peripheral nerve. The program aims to stimulate the part of the innervated healthy muscle.
Session duration: 20 minutes, in one phase.
Electrodes'positioning: photos from 01 to 22 of the *Position manual,.*
Intensity: intensity should be adjusted in order to produce a good contraction of the treated muscle.

⚠ **ATTENTION**: In the case of the programs R01 and R02 we recommend rectangular electrodes (measuring 50x90 mm) for medium-high intensities. With smaller electrodes, the device could generate an alarm and, therefore, not perform the treatment correctly.

R03 • Stress incontinence (medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions. **Consult your doctor before using this program and during the treatment period.**
Session duration: 13 minutes.
Intensity: to be adjusted above the perception threshold to produce light internal stimulation.

R04 • Urgency incontinence (medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions. **Consult your doctor before using this program and during the treatment period.**
Session duration: 13 minutes.
Intensity: to be adjusted above the perception threshold to produce light internal stimulation.

R05 • Mixed incontinence (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions. **Consult your doctor before using this program and during the treatment period.**
Session duration: 13 minutes.
Intensity: to be adjusted above the perception threshold to produce light internal stimulation.

⚠ **ATTENTION:** when using programs R03, R04 and R05, we recommend using probes that have been certified by a notified body as a "class IIa medical device". The probes should be provided with instructions for use, cleaning and storage as well as any information relevant to the user.

R06 • Anti-inflammatory (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Program recommended for inflammatory conditions. Apply until the inflammatory state is reduced. Up to 2 treatments daily if required.
Session duration: 30 minutes, in one phase.
Electrodes' positioning: identified the area to be treated, position the electrodes as shown in *Figure 2*.
Intensity: adjusted just above the threshold of perception.

R07 • Neck pain/Headache (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Specific program for the treatment of pain in the neck area, divided in two phase: the first set to TENS with a narrow pulse and the second de-

contracting one. The first benefits can be seen after 10 to 12 treatments carried out on a daily basis; proceed with the treatment until the symptoms pass.
Session duration: 33 minutes.
Electrodes' positioning: photo 25 of the *Positions manual*.
Intensity: to be adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the treated area begin to contract.

R08 • Backache/Sciatic pain (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Specific program for the treatment of pain in the lumbar area or along the sciatic nerve, or both. Divided into two phases: the first set to TENS with a narrow pulse and the second TENS pulse Burst. The first benefits can be seen after 12 to 15 treatments carried out on a daily basis; proceed with the treatment until the symptoms pass.
Session duration: 35 minutes.
Electrodes' positioning: dorsal / paravertebral - photo 10, lumbar - photo 27, sciatic nerve - photo 28 of the *Position manual*.
Intensity: adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract; over this limit stimulation does not become more effective, just more irritating, so it is best to stop before that point.

R09 • Sprains/Bruises (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
After this type of injury, it develops its effectiveness with a pain-inhibiting action at the local level. The program is divided into two phases: the first conventional TENS set, while the second one sets for hematomas. There is no specific number of treatments, it is recommended to repeat the program until the pain is lessened, on a daily basis (even 2/3 times a day).
Session duration:30 minutes.
Electrodes' positioning: photo 32 of the *Position manual.*
Intensity: to be adjusted between the threshold of perception and pain.

R10 • Hand and wrist pain (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This program is suitable for all types of hand and wrist pain (for example Carpal Tunnel Syndrome). The intensity shall be adjusted 3 times, one for each time one of the phases begins. The different frequencies that are used, 70 Hz in the first phase, 90Hz in second phase and 110Hz in the third phase, aim to activate the nerve fibers of different diameters, in order to inhibit the transition of the pain signal at spinal level.
Session duration: 40 minutes.
Electrodes' positioning: photos 33 of the *Position manual.*
Intensity: adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract.

R11 • Plantar stimulation (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This program has a relaxing and draining effect on the limb stimulated. It is ideal for people suffering from a sense of "heaviness in the legs".
Session duration: 40 minutes.
Electrodes' positioning: 2 electrodes on the sole of the foot (one positive, the other negative), one close to the toes and the other under the heel.
Intensity: set above the threshold of perception.

R12 • Epicondylitis (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Also known as "tennis elbow", it is an insertional tendinopathy concerning insertion of the elbow bone into the epicondylar muscles, those enabling finger and wrist extension (bending backwards).
It is recommended 15 applications once a day (even twice), until the symptoms pass. First it is recommended that you consult your doctor to identify the precise cause of the pain in order to prevent the condition from reoccurring.
Session duration: 40 minutes.
Electrodes' positioning: photo 29 in the *Positions manual*.
Intensity: to be adjusted above the perception threshold.

R13 • Epitroclea (medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

Also known as “golfing elbow”, it affects golfers but also those who carry out repetitive tasks or tasks involving frequent intense strain (for example carrying a particularly heavy suitcase). It causes pain in the flexor and pronator tendons inserted in the epitroclea. Pain is felt when bending or straightening the wrist against resistance, or when clenching a hard rubber ball in the hand.

It is recommended 15 applications once a day (even twice), until the symptoms pass. First it is recommended that you consult your doctor to identify the precise cause of the pain in order to prevent the condition from reoccurring.

Session duration: 40 minutes.

Electrodes’ positioning: photo 29 in the *Positions manual,* but with all the electrodes positioned on the inside of the arm (with a rotation of about 90°).

Intensity: to be adjusted above the perception threshold.

R14 • Periarthritis (medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

Scapulo-humeral periarthritis is an inflammatory condition affecting the fibrous tissues surrounding joints: tendons, serous sacs and connective tissue. These appear altered and can break into fragments and calcify. If neglected, this condition can become heavily crippling. For this reason, after carrying out a cycle of 15/20 applications once a day, it is recommended that you consult your doctor for a cycle of specific rehabilitation exercises to reduce the pain.

This program consists of various phases including TENS and muscle stimulation aimed at improving the tone of the muscles surrounding the joint.

Session duration: 41 minutes.

Electrodes’ positioning: photo 26 in the *Positions manual.*

Intensity: to be adjusted above the perception threshold with small muscle contractions at the end of the program (10 minutes before the end).

R15 • Neuralgias (medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
Program suitable for people suffering from neuralgie. It is recommended 2 daily treatments for 10/12 days
Session duration: 30 minutes, in one phase.
Electrodes' positioning: identified the area to be treated, position the electrodes as shown in *Figure 2*.
Intensity: to be adjusted above the perception threshold.

R16 • Mestrual pains (medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
Program divided in two phases, the first one is set on the conventional TENS program and the secondo ne on the TENS Burst program.
Session duration: 35 minutes.
Electrodes' positioning: 2 electrodes of channel 1, on the lower abdomen.
Intensity: adjusted so as to perceive a slight tingling, not annoying.

R17 • Carpal tunnel (medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
Session duration: 30 minutes, in one phase.
Electrodes' positioning: photo 33 of the *Position Manual.*
Intensity: adjusted so as to perceive a slight tingling, not annoying.

R18 • Tendinitis (medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
active channels: CH1
Session duration: 20 minutes, in one phase.
Electrodes' positioning: 2 electrodes of channel 1, over the painful area.
Intensity: adjusted so as to perceive a slight tingling, not annoying.

R19 • Strain (medical program)
***Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.)*
active channels: CH1
Session duration: 20 minutes, in one phase.
Electrodes' positioning: 2 electrodes of channel 1, over the affected area.
Intensity: adjusted between 6 and 12. The maximum selectable intensity is 12.

R20 • Muscle tears (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**) active channels: CH1
Session duration: 20 minutes, in one phase.
Electrodes' positioning: 2 electrodes of channel 1, over the affected area.
Intensity: adjusted between 6 and 12. The maximum selectable intensity is 12.

R21 • Herpes Zoster (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Session duration: 30 minutes, in one phase.
Electrodes' positioning: form a square as in *Figure 2*, using channel 1 and 2.
Intensity: adjusted so as to perceive a slight tingling, not annoying.

R22 • Wound/healing (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Use rubber and buckskin electrodes or conductive rubber sponge-covered electrodes. For repairing tissue, place sterile gauze dampened with a saline solution on the wound: the positive electrode is placed on the wound, and the negative electrode is placed distally or (if the treated zone is too thick) at 10 cm of distance. This causes migration of the vascular cells and the synthesis of collagen, increasing the speed of recovery.
Session duration: 15 minutes, in one phase.
Electrodes' positioning: are used the 2 electrodes of the channel 1.
Intensity: adjusted between the threshold of perception and the pain threshold.

R23 • Wounds/bactericide (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Use rubber and buckskin electrodes or conductive rubber sponge-covered electrodes.
Place a sterile gauze dampened with a saline solution on the wound to kill any bacteria. Cathode (positive electrode, red plug) is placed on the wound and negative electrode is placed distally or (if the treated zone is too thick)

at a distance of 10 cm. This provokes a bactericide effect and consequently the growth of pathogenic microorganisms is delayed.
Session duration: 15 minutes in one phase.
Electrodes' positioning: are used the 2 electrodes of the channel 1.
Intensity: adjusted between the threshold of perception and the pain threshold.

R24 • Venous insufficiency (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
The program is indicated for the treatment of venous insufficiency. It is possible to use square or rectangular electrodes according to the size of the calf and the comfort of the patient. Start the program by selecting an intensity able to produce a good (not painful) muscular contraction.
Session duration: 60 minutes, one phase.
Electrodes' positioning: place the 2 electrodes of channel 1 on the left calf and the 2 electrodes of channel 2 on the right calf.
Intensity: able to produce a good (not painful) muscular contraction.

R25 • Superficial osteogenesis (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
***active channel: CH1* and CH3**
A study of the healing of fractures was carried out in 1968 in Japan and the United States. This study consists of two main techniques:

1. The implanting of sharp needle electrodes near the bone to be calcified (invasive technique).
2. The positioning of self-adhesive electrodes on the external surface near the bone.

We consider the second technique for the treatment of fractures, in particular when the bone to be stimulated is in a superficial position (vertebral column, wrist, kneecap, ankle, etc.). This technique is not suitable if the bone is in a deep position (femur, humerus, radius, etc.). For the treatment of the vertebral column use 2 rectangular electrodes measuring 50x90mm. To treat smaller zones (for example the wrist), use electrodes measuring 48x48mm.
Session duration: 60 minutes.
Electrodes' positioning: 2 electrodes of channel 1 must be placed at 10 cm from each other near the bone to be treated.
Intensity: maximum selectable is 30.

Table of current density with electrodes measuring 48x48mm:

Value displayed on screen	Current density mA/cm²	Current density µA/cm²
5	0,034	34
10*	**0,068**	**68**
20	0,137	137
30	0,205	205

Table of current density with electrodes measuring 50x90mm:

Value displayed on screen	Current density mA/cm²	Current density µA/cm²
5	0,0175	17,5
10*	**0,035**	**35**
20*	**0,07**	**70**
30	0,105	105

* The recommended intensity ranges are in bold.

EMS Programs

Prg	Medical Progr. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3	PHASE 4
E01	No	Firming up	Total time 5min Frequency 6Hz	Total time 20min (60rip) 13s at 6 Hz 1r+5+1r sec at 30Hz	Total time 5min Frequency 3Hz	
E02	No	Toning up	Total time 5min Frequency 6Hz	Total time 20min (60rip) 13s a 8 Hz 1r+5+1r	Total time 5min Frequency 3Hz	

Prg	Medical Progr. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3	PHASE 4
				sec at 45Hz		
E03	No	Basic Strength	Total time 5min Frequency 8Hz	Total time 10min (30rip) 13s a 6Hz 1r+5+1r s at 50Hz	Total time 10min (30rip) 14s a 4Hz 1r+4+1r sec at 70Hz	Total time 5min Frequenc y 3Hz
E04	No	Fast Strength	Total time 3min Frequency 6Hz	Total time 10min (30rip) 14s a 6Hz 1r+4+1r sec at 70Hz	Total time 8min (32rip) 10s a 4Hz 1r+3+1r sec at 70Hz	Total time 5min Frequenc y 3Hz
E05	No	Explosive Strength	Total time 3min Frequency 6Hz	Total time 10min (20rip) 24s a 2Hz 1r+4+1r sec at 90Hz	Total time 10min (20rip) 24s a 2Hz 1r+4+1r sec at 110Hz	Total time 5min Frequenc y 3Hz
E06	No	Resistant Strength	Total time 5min Frequency 6Hz	Total time 10min (20rip) 20s at 6Hz 2r+6+2r sec at 30Hz	Total time 10min (20rip) 20s at 6Hz 2r+6+2r sec at 40Hz	Tempo tot 5min Frequenc y 3Hz
E07	No	Endurance	Total time 5min Frequency 6Hz	Total time 20min 18s at 8Hz, 2s a 2Hz, 10s	Total time20min 20s at 10 Hz, 2s at 2Hz, 8s at 25Hz	Total time 5min Frequenc y 3Hz

Prg	Medical Progr. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3	PHASE 4
				at 18Hz		
E08	No	Capillarisa-tion	Total time 30min, 4min at 8Hz, 1min at 3Hz			
E09	No	Muscle Recovery	Total time 15min, Freq. step 6/4/2Hz			
E10	No	Agonist/ Antagonist	Total time 3min Frequency 6Hz	Total time 20min Altern. Contr. CH 1/2 3/4, 6s a 8Hz 1r+5+1r sec 50Hz CH1/2 1r+5+1r sec 50Hz CH3/4		Total time 10min Frequenc y 3Hz
E11	No	Lipolysis	Total time 5min Frequency 6Hz	Total time 20min (60rip) Altern. Contr. CH 1/2 3/4 6s at 8Hz 7s at 40Hz (CH1/2) 7s at 40Hz (CH3/4)	Total time 5min Frequency 3Hz	
E12	No	Drainage	Total time 3min Frequency 6Hz Pulse width 300µs	Total time 10min Contraz. in sequence on 4 channels	Total time 10min Contraz. in sequence on 4 channels (20-400µS) 3r+3r sec a	Total time 2min Frequenc y 3Hz Pulse width 300µs

Prg	Medical Progr. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3	PHASE 4
				(20-400µS) 3r+3r sec at 70 Hz	70Hz	
E13	No	Microlifting	Total time 15min Frequency 12Hz Pulse width 100µs			
E14	Yes	Atrophy prevention	Total time 5min Frequency 8Hz	Total time 10min 9s at 4Hz 3r+3r sec at 30Hz	Total time 10min 9s at 4Hz 3r+3r s at 40Hz	Total time 5min Frequenc y 3Hz
E15	Yes	Atrophy	Total time 3min Frequency 6Hz	Total time 25min 6s pause 3r+3r sec at 40Hz Pulse width 400µS	Total time 2min Frequency 3Hz	
E16	No	Sequential Tonic contraction 1	Total time 3min Frequency 6Hz Pulse width 300µs	Total time 10min Contraz. in sequence on 4 channels (40-300µS), 3r+3r sec at 40Hz	Tempo tot 10min Contraz. in sequence on 4 channels (40-300µS), 3r+3r sec a 40Hz	Tempo tot 2min Frequenc y 3Hz Pulse width 300µs

Prg	Medical Progr. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3	PHASE 4
E17	No	Sequential Tonic contraction 2	Total time 3min Frequency 6Hz Pulse width 300µs	Total time 10min Contraz. in sequence on 4 channels (40-300µS), 3r+3r sec at 60Hz	Total time 10min Contraz. in sequence on 4 channels (40-300µS), 3r+3r sec at 60Hz	Total time 2min Frequenc y 3Hz Pulse width 300µs

ATTENTION! Intensity of stimulation: EMS programs (Firming up and Toning up, Strength, Endurance, Agonist/Antagonist) are divided in 3 phases: warm up phase, work phase, recovery phase. During the warm up phase (phase 1) the intensity of stimulation has to be set in order to produce reasonable solicitation of the muscle and warm it up without causing fatigue (18÷30mA). During the work phases (the middle phases of each program), T-ONE alternates contraction impulses with active recovery impulses. The two intensities must be selected separately: the contraction intensity (shown by a full bar on the display) should be set at 20÷30 for not very trained people, 30÷50mA for trained people, over 50mA for well trained people.

We suggest that you set the recovery intensity value (between one contraction and another) at about 10÷15% less than the contraction intensity value. During the last recovery phase, the intensity value has to be set for good massaging of the stimulated part, without producing pain (18÷30).

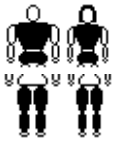
E01 • Firming up (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

Indicated for firming up muscles in the arms and bust, or the legs; working mainly on slow-twitch fibres. Treatment frequency: 3/4 times a week.
Session duration: 30 minutes.

Intensity: such as to produce good contractions but not painful, beginning with 15, by gradually increasing the intensity with advancing weeks.
Electrodes'positioning: from *Positions manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).



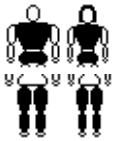
Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2	Phase 3
5 min Warm up	20 min Training 13s Recovery 7s Work 30Hz	5 min Recovery

E02 • Toning (non-medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
The toning up program is suitable for improving trophsim and for the recovery of normal strength in the treated muscle. This program is indicated after a complete cycle of a minimum of 10 treatments with the *E01 Firming up* program.. Benefits can be seen after just 10/15 treatments and these become more definite after two months of regular treatment.
Treatment frequency: 2/3 weekly sessions.
Session duration: 30 minutes.
Intensity: has to be middle/high with a contraction between the thresholds of perception and pain (20÷30).
Electrodes'positioning: from *Positions manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).



Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2	Phase 3
5 min Warm up	20 min Training 13s Recovery 7s Work 45Hz	5 min Recovery

E03 • Base strenght (non-medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

The basic strength program is used in sport to develop basic strength which, by definition, is the maximum tension that a muscle can exert against constant resistance. The contractions alternate with periods of active recovery during the work phase, allowing the muscle to be trained without subjecting it to stress and improving oxygenation of the same muscle.

The basic rule for obtaining initial results is as follows: two sessions per week (for each muscle region) for the first three weeks at increasing intensity (20÷30), three sessions per week for the next three weeks at high intensity (30÷50).

Intensity must be increased gradually treatment by treatment, without overstraining the muscles. In the event of fatigue, suspend training for a few days and revert to the *E09 Muscle Recovery* program instead.

ATTENTION: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 30 minutes.

Electrodes' positioning: from *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).

Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2	[illegible] to m ati	Phase 3	Phase 4

5min Warm up	10min Training 13s Recovery 7s Work 50Hz		10min Training 14s Recovery 6s Work 70Hz	5min Recovery

E04 • Fast strenght (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

This program is designed to increase speed in fast athletes and develop it in athletes lacking the quality.

The exercise assumes a fast pace and the contraction is short, as is the recovery. It is usually best to complete a three-week basic strength cycle of increasing intensity before using this program. Then continue with three weeks of fast strength three times a week at high intensity (30÷50mA).

ATTENTION: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 26 minutes.

Electrodes' positioning: from *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).

Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2		Phase 3	Phase 4
3min Warm up	10min Training 14s Recovery 6s Work	Intensity Automatic Increase	8min Training 10s Recovery 5s Workn	5min Recovery

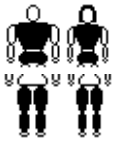
E05 • Explosive strenght (non-medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Explosive strength programs increase the explosive power and speed of the muscle mass, with extremely short, strengthening contractions and very long active recovery times to allow the muscle to regain strength. It is usually best to complete a three-week basic strength cycle of increasing intensity before using this program. Then continue with three weeks of explosive strength twice a week.
Intensity: during contraction the intensity must be the highest that can be endured in order to obtain maximum muscle exertion whilst involving the greatest number of fibres (over 35mA).

ATTENTION: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 28 minutes.
Electrodes' positioning: from *Position manual:*


Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).


Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)
Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2		Phase 3	Phase 4
3min Warm up	10min Training 24s Recovery 6s Work	Intensity Automatic Increase	10min Training 24s Recovery 6s Workn	5min Recovery

E06 • Resistance Strength (non-medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
This program is designed to help increase resistance to physical stress, or rather withstand intense exertion for a longer amount of time in muscle

regions subjected to stimulation. Indicated for sporting disciplines involving long, intense periods of exertion

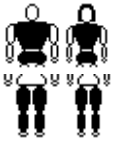
Intensity: during work: follow the indications mentioned at the beginning of the EMS Program chapter.

ATTENTION: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 30 minutes.

Electrodes' positioning: from *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).



Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2		Phase 3	Phase 4
5min Warm up	10min Training 20s Recovery 10s Work	Intensity Automatic Increase	10min Training 20s Recovery 10s Workn	5min Recovery

E07 • Resistance (non-medical program)

Cable type: TYPE 1 (see*Errore. L'origine riferimento non è stata trovata.****)***

The Endurance program is used in sports to increase muscle endurance capacity, acting mainly on slow-twitch fibres.

Program indicated for endurance sports: marathon runners, cross-country runners, ironman, etc.

Intensity: during work: follow the indications mentioned at the beginning of the EMS Program chapter.

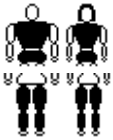
ATTENTION: : the program involves an automatic increase in intensity between the second and the third phase. Consequently it

will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 50 minutes.

Electrodes' positioning: from *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hand Extensors (photo 04), Hand Flexors (photo 05), Deltoid (photo 06).



Abdominals (photo 01/20), Pectoral / Breast (photo 07/17), Trapezius (photo 08), Large dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Biceps femoris (photo12), Calves (photo13), Anterior tibial (photo14).

Phase 1	Phase 2		Phase 3	Phase 4
5min Warm up	20min Training 20s Recovery 10s Work	Intensity Automatic Increase	10min Training 22s Recovery 8s Workn	5min Recovery

E08 • Capillarisation (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

This program significantly increases arterial flow in the area treated. Prolonged use of this program develops the intramuscular capillary network of fast-twitch fibres. The effect obtained is an increase in the capacity of fast-twitch fibres to withstand strain over extended periods of time. For an athlete with good endurance, the capillarisation program is very useful for recovery after intense aerobic work, before anaerobic work and when training is not possible (due to bad weather or an injury).

Session duration: 30 minutes, one phase.

Electrodes' positioning: photos from 01 to 20 of the *Position manual*.

Intensity: medium (20÷30mA).

E09 • Muscle recovery (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

Can be used for all sports, after competitions or the most demanding training sessions, in particular after long and intense exertion. To be used immediately after exertion. Helps drainage and winding down, improving muscle oxygenation and helping to discharge synthetic substances produced during exertion.
Session duration: 15 minutes, in one phase.
Electrodes' positioning: photos from 01 to20 of the *Position manual*.
Intensity: medium/low(15÷25mA), with increment in the last 5 minutes.

E10 • Agonist / Antagonist (non-mediacal program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
The electric stimulator produces alternating contractions on the 4 channels: during the first phase of warm-up the 4 channels work simultaneously, during the second work phase muscle contractions are alternated between Channel 1 and 2 (agonist muscles) and Channel 3 and 4 (antagonist muscles). The program is designed to restore muscle tone to the quadriceps and its antagonist the leg biceps, or the biceps brachii and the triceps. The work aims at developing strength. In the second work phase it is necessary to select the intensity 3 times: recovery intensity of four channels, work intensity of Channels 1 and 2 (agonist muscles) and work intensity of Channels 3 and 4 (antagonist muscles).
Intensity of stimulation during work: follow the indications mentioned at the beginning of the "EMS Program" chapter. Intensity must be increased gradually treatment by treatment, without overstraining the muscles. Suspend training for a few days in the event of fatigue and proceed with the E09 Muscle Recovery program.
Intensity: during work: follow the indications mentioned at the beginning of the EMS Program chapter. Intensity must be increased gradually treatment by treatment, without overstraining the muscles. Suspend training for a few days in the event of fatigue and proceed with the E09 Muscle Recovery program.
Session duration: 33 minutes.
Electrodes' positioning: dal *Manuale posizioni:*

Biceps (CH1+CH2 - photo 02) / Triceps (CH3+CH4 – photo 03),
Hand Extensors (CH1+CH2 – photo 04) / Hand Flexors (CH3+CH4 - photo 05).

Quadricipes (CH1+CH2 – photo 11) / Femoral biceps (CH3+CH4 - photo 12).

Phase 1	Phase 2	Fase 3
3min Warm up	20min work alterned over channel pairs: 6s recovery 7s work on CH1/CH2 + 7s work on CH3/CH4	10min Recovery

E11 • Lipolysis (non-medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

This program is widely used in the field of beauty treatments to increase micro-circulation and promote lymphatic activity in areas where there are fatty deposits. This program greatly increases the local metabolism thanks to its trophic action; it helps to reduce the orange-peel effect when combined with a low-calorie diet. Treatment sessions can have a daily frequency.

The program produces sequential tonic contractions (first CH1/CH2 then CH3/CH4), reproducing the typical effect of electronic lymphatic drainage. The logic for application of the electrodes is the following: CH1/CH2 at the extremities of the limbs (for example the calf or forearm) and CH3/CH4 at the top (for example the thigh or biceps brachii).

Intensity: to produce good (not painful) effects in the stimulated areas (20÷30mA).

Session duration: 30 minutes.

Electrodes' positioning:

- Hands Extensors CH1/Hand flexors CH2 – photo 04/05 of the *Position manual* with 2 electrodes.
- Biceps brachii CH3/triceps CH4 – photo 02/03 of the *Position manual* with 2 electrodes.
- Calves CH1/anterior tibial muscles CH2 – photo 13/14 of the *Position manual* with 2 electrodes.
- Quadriceps CH3/femoral biceps CH4 – photo 11/12 of the *Position manual* with 2 electrodes.

Phase 1	Phase 2	Fase 3

5min Warm up	20min work alternated over channel pairs: 6s recovery 7s work on CH1/CH2 7s work on CH3/CH4	5min Recovery

E12 • Drainage (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

The purpose of these programs is to promote drainage, increasing microcirculation inside and around treated muscular fibres, also creating rhythmic contractions to facilitate the flow of algogenic substances and lymphatic activity. This program can be useful for elderly people, to aid blood circulation and lymphatic circulation.

Sequential tonic contractions are carried out during phases 2 and 3 to produce the typical effect of electronic lymphatic drainage. However, unlike the lipolysis program, the contractions are sequential: first CH1, then CH2, CH3 and CH4.

There are no real limits to the use of these programs, so they can continue to be used until the desired result is achieved. Normally the first results appear after 3/4 weeks with 4/5 weekly sessions.

Intensity: must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷30mA).

Session duration: 25 minutes.

Electrodes' positioning: from the *Position manual:*

Muscle Groups:	all the muscles you want to stimulate in sequence. Connect one channel for each muscle, considering that the contractions are in sequence on the 4 channels.

Phase 1	Phase 2	Phase 3
3min Warm up	20min sequential contractions on 4 channels	2min Recovery

E13 • Microlifting (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

The following program is used to tone the facial muscles, through a particular impulse that improves both the aesthetic and the dynamic aspect of the facial muscles.

Session duration: 15 minutes, pnly one phase.

Electrodes' positioning: photo 24 of the *Position Manual*.
N.B. maintain a minimum distance of 3 cm between electrode and eyeball.

IMPORTANT: pay attention on the intensity regulation, in that the facial muscles are particularly sensitive, it is recommended to gradually regulate the intensity, starting from a very low level of stimulation (for example 3÷10mA) and then with caution increase until you reach a good activation of the muscles.

IMPORTANT: it is not necessary get to intensity levels such that provide discomfort! The equation more pain = more benefit is completely misleading and counterproductive.

Great and important goals are achieved with perseverance and patience.

E14 • Atrophy prevention (medical program)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

Program created to maintain muscle trophism. This treatment focuses on the toning of muscles, and of slow-twitch fibres in particular. Particularly indicated for patients recovering from an accident or an operation. Prevents the reduction of muscle trophism caused by physical inactivity. The muscle area concerned can be stimulated with daily applications of low intensity; if you increase the intensity, leave a day of rest between applications to allow the muscles to recover.

ATTENTION: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Session duration: 30 minutes.
Electrodes' positioning: from the *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hands Extensors (photo 04), Hand flexors (photo 05), Deltoid (photo 06).

Abdominals (photo 01/20), Pectoral / breast (photo 07/17), Trapezius (photo 08), Dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Femoral biceps (foto12), Calves (foto13), Anterior tibial muscles (foto14).

Phase 1	Phase 2		Phase 3	Phase 4
5min Warm up	Session duration 10min 9s recovery 6s work	Intensity Automatic Increase	Session duration 10min 9s recovery 6s work	5min Recovery

E15 • Atrophy (medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

This program acts selectively on slow-twitch fibres. Ideal for recovering muscle trophism after a long period of inactivity or an accident.

Program to be carried out when loss of muscle tone has already occurred. Apply with caution (at low intensity, enough to produce light muscle contractions) in the first 2/3 weeks. Increase intensity progressively over the next 3/4 weeks. Application on alternate days.

Session duration: 30 minutes.

Electrodes' positioning: from the *Position manual:*

Biceps (photo 02/15), Triceps (photo 03/16), Hands Extensors (photo 04), Hand flexors (photo 05), Deltoid (photo 06).

Abdominals (photo 01/20), Pectoral / breast (photo 07/17), Trapezius (photo 08), Dorsal (photo 09), Gluteus (photo 19)

Quadriceps / thighs (photo 11/18), Femoral biceps (foto12), Calves (foto13), Anterior tibial muscles (foto14).

Phase 1	Phase 2	Phase 3
3min Warm up	Session duration 25min: 6s recovery + 6s work	2min Recovery

E16 • Sequential tone 1 (non-medical program)

Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***

This program increases microcirculation within and around the muscle fibres treated creating rhythmic contractions, promoting better drainage and toning. It can also be applied to older people to improve blood and

lymphatic circulation in the lower limbs (e.g. applying CH1 to the right calf, CH2 to the left calf, CH3 to the right thigh, CH4 to the left thigh).
The programs produce sequential tonic contractions on 4 channels to produce the typical effect of electronic lymphatic drainage. These programs can be carried out using self-adhesive electrodes. It mainly works on slow-twitch fibres.
Intensity: must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷25mA).
Session duration: 25 minutes.
Electrodes' positioning: from the *Positions manual:*

Muscles Group all you want to stimulate in a sequence

Phase 1	Phase 2	Phase 4
3min Warm up	20min sequential contractions on 4 channels 6s duration each	2min Recovery

E17 • Sequential tone 2 (non-medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
This program produces rhythmic contractions with a stimulation frequency typical of fast-twitch fibres. Thanks to the high stimulation frequency it is suitable for increasing muscle strength sequentially.
The programs produce sequential phasic contractions on four channels in phase 2 and 3. These programs can be carried out using self-adhesive electrodes. Unlike the previous program, this one uses a higher stimulation frequency during the contraction phase and therefore works mainly on fast-twitch fibres.
Intensity: must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷40).
Session duration: 25 minutes.
Electrodes' positioning: from the *Position manual* based on the area to be treated.

Phase 1	Phase 2	Phase 4
3min Warm up	20min sequential contractions on 4 channels 6s duration each	2min Recovery

Programmable memories

Prg	Medical Prog. Yes/No	Description	PHASE 1
M01-M02	Yes	Denervated 1/2	Total time from 1 to 60min Adjustable frequency 0,25-2Hz Adjustable pulse width 40 -400ms
M03-M06	Yes	TENS MEM	Total time from 1 to 60min Adjustable frequency 0,25-120Hz Adjustable pulse width 20-500µs
M07	Yes	TENS Spyke	Total time from 1 to 60min Adjustable frequency 0,25-120Hz Adjustable pulse width 20-500µs
M08-M09	No	EMS 1s slope	Total time from 1 to 60min Recovery frequency 0-12Hz, Contraction frequency 20-120Hz Recovery period 2-28s, Contraction period 2-10s Pulse width 60-500µs
M10-M11	No	EMS 2s slope	Total time from 1 to 60min Recovery frequency 0-12Hz, Contraction frequency 20-120Hz Recovery period 2-28s, Contraction period 2-10s Pulse width 60-500µs
M12-M13	No	EMS 3s slope	Total time from 1 to 60min Recovery frequency 0-12Hz, Contraction frequency 20-120Hz Recovery period 2-28s, Contraction period 2-10s Pulse width 60-500µs
M14-M15	No	FES	Total time from 1 to 60min Recovery Frequency 0-12Hz, Contraction frequency 20-120Hz Recovery period 2-24s, Contraction period 6-10s Pulse width 60-500µs
M16-	No	Agonist/	Total time from 1 to 60min

Prg	Medical Prog. Yes/No	Description	PHASE 1
M18		antagonist	Recovery frequency 0-12Hz, Contraction frequency 20-120Hz Recovery period 2-26s, Contraction period 6-10s Pulse width 60-500µs

M01/M02 • Denervated 1/2 (medical programs)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**) active channels CH1 and CH3

Stimulation programs of the denervated muscle.

Electrodes' positioning: use 2 big electrodes, better if wet and in a sponge, placed at the two ends of the muscle to be treated.

- To move the cursor and select the stimulation parameter, use the right and left arrow keys, change the values with the up and down arrow keys.
- Once all the stimulation parameters have been set, position the cursor on "OK" to memorize the program.
- To start the stored program, press the OK button.
- The end of the program is signaled with a triple acoustic signal.
- With pulses greater than 100ms, set maximum frequency to 1 Hz.

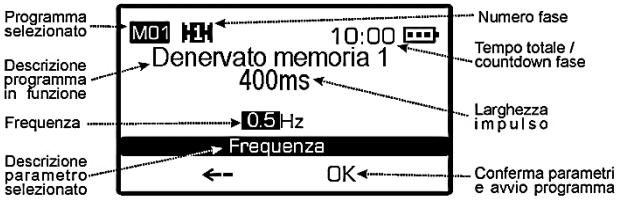


Table of settable values:

Parameter Description	Minimum	Maximum
Frequency	0,25 Hertz	2 Hertz
Impulse width	40 milliseconds	400 milliseconds
Program total time	1 minute	60 minutes

ATTENTION: In the case of programs M01 and M02, we recommend the use of rectangular electrodes (measuring 50x90 mm) for stimulation at

medium-high intensity. With smaller electrodes, the device could generate an alarm and, therefore, not perform the treatment correctly.

M03/M04/M05/M06 • TENS memory 3/4/5/6 (medical programs)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Available programs to set rapid tens, endorphinic tens, maximum values
Electrodes' positioning: forming a square above the area to be treated as *Figure 2*.

- To move the cursor and select the stimulation parameter, use the right and left arrow keys, change the values with the up and down arrow keys.
- Once all the stimulation parameters have been set, position the cursor on "OK" to memorize the program.
- To start the stored program, press the OK button.

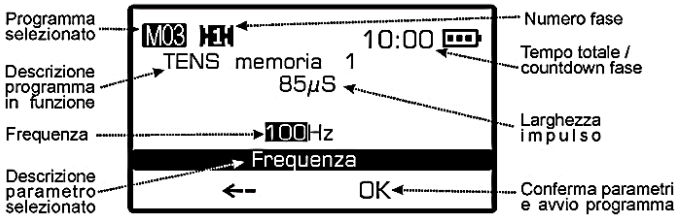


Tabella valori impostabili:

Parameter Description	Minimum	Maximum
Frequency	0,25 Hertz	120 Hertz
Impulse width	20 microseconds	500 microseconds
Program total time	1 minute	60 minutes

M07 • TENS Spyke (medical program)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
Available programs to set Tens Spyke.
Electrodes' positioning: forming a square above the area to be treated as *Figure 2*.

- To move the cursor and select the stimulation parameter, use the right and left arrow keys, change the values with the up and down arrow keys.
- Once all the stimulation parameters have been set, position the cursor on "OK" to memorize the program.

- To start the stored program, press the OK button.

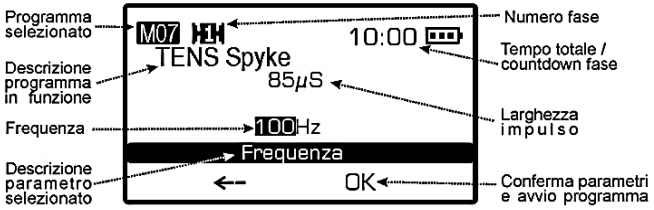


Table of settable values:

Parameter Description	Minimum	Maximum
Frequency	0,25 Hertz	120 Hertz
Impulse width	20 microseconds	500 microseconds
Program total time	1 minute	60 minutes

M08/M09 • EMS ramp of 1 second (non-medical programs)
Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

ATTENTION: 1 second slopes make for a faster contraction, while 2/3 second slopes make for a more progressive contraction. In the case of memories 12 and 13 in particular, a 3 second slope can be used to obtain a "triangular" impulse parameters are continuously adjusted. This program is specifically indicated for the treatment of partially denervated muscles.

- To move the cursor and select the stimulation parameter, use the right and left arrow keys, change the values with the up and down arrow keys.
- Once all the stimulation parameters have been set, position the cursor on "OK" to memorize the program.
- To start the stored program, press the OK button.
- The end of the program is signaled with a triple acoustic signal.

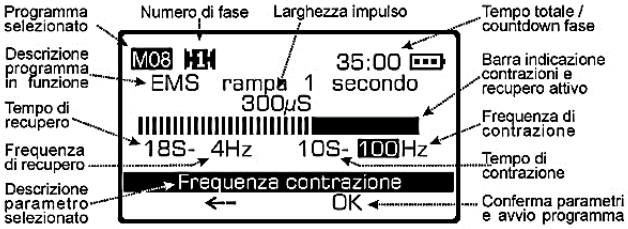


Table of settable values:

Parameter description	Minimum	Maximum
Contraction frequency	20 Hertz	120 Hertz
Contraction period	2 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery period	2 seconds	28 seconds
Impulse width	60 microseconds	500 microseconds
Program total time	1 minute	60 minutes

M10/M11 • EMS ramp of 2 seconds (non-medical programs)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
Table of settable values:

Parameter description	Minimum	Maximum
Contraction frequency	20 Hertz	120 Hertz
Contraction period	4 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery period	2 seconds	26 seconds
Impulse width	60 microseconds	500 microseconds
Program total time	1 minutes	60 minutes

M12/M13 • EMS ramp of 3 seconds (non-medical programs)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
Table of settable values:

Parameter description	Minimum	Maximum
Contraction frequency	20 Hertz	120 Hertz
Contraction period	6 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery period	2 seconds	24 seconds
Impulse width	60 microseconds	500 microseconds
Program total time	1 minute	60 minutes

M14/M15 • FES (non-medical program)
Cable type: TYPE 1 (see *Errore. L'origine riferimento non è stata trovata.**)***
Available programs to set treatments for incontinence prevention and cure.

Table of settable values:

Parameter description	Minimum	Maximum

Contraction frequency	20 Hertz	120 Hertz
Contraction period	6 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery period	2 seconds	24 seconds
Impulse width	60 microseconds	500 microseconds
Program total time	1 minute	60 minutes

M16/M17/M18 • Agonist/antagonist (non-medical programs)

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)

Available programs to set treatments with alternated contractions on a pair of channels.

Electrodes' positioning: to refer to the photos of the *Position manual*.

- To move the cursor and select the stimulation parameter, use the right and left arrow keys, change the values with the up and down arrow keys.
- Once all the stimulation parameters have been set, position the cursor on "OK" to memorize the program.
- To start the stored program, press the OK button.
- The end of the program is signaled with a triple acoustic signal.

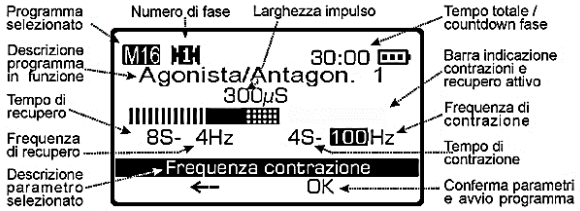


Table of settable values:

Parameter description	Minimum	Maximum
Contraction frequency	20 Hertz	120 Hertz
Contraction period	2 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery period	2 seconds	26 seconds
Impulse width	60 microseconds	500 microseconds
Program total time	1 minute	60 minutes

C01 • Controlled stimulation (non-medical program).

Cable type: TYPE 1 (see** Errore. L'origine riferimento non è stata trovata.**)
active channels: CH1

This program can be used when there is a need to research the muscle's innervation point very precisely. It is used exclusively by connecting a tip (finder pen) to the red 2mm plug and positioning a pregelled electrode on the muscle belly: by activating stimulation and moving the tip near the muscle innervation point it is possible to have an immediate visual perception of the point of maximum contraction muscle.

Surface electromyography instructions for use (sEMG)

In the I-TECH PHYSIO EMG version, the device is equipped with a biofeedback module that is based on receiving of surface electromyographic signals (sEMG). It's designed to detect signals generated by the human body and gives feedback from two channels. The bioelectrics signals are detected in single differential modality with bipolar electrodes.

These signals are amplified, filtered, and converted to digital. The device doesn't show an electromyographic signal, but a contraction (bar) signal also indicated in µV, like differential value between refer electrode and bipolar electrode: in this respect, the indicated value is simply a reference that must not be considered like a value with diagnostic purpose (doesn't provide information nearly the muscle condition or the presence of pathologies) but only serves to physiotherapist/doctors to set up an active muscle session/training for the patient. The EMG module should not be intended as a medical device with diagnostic purpose.

The biofeedback is both visible (display) and both acoustic (internal buzzer).

With I-TECH PHYSIO EMG is possible recorder different levels of maximum voluntary contraction of two muscles and so set up different thresholds of feedback for each muscle and execute a controlled work calibrating the training degree.

ATTENTION! It's recommended not to use the electromyography (EMG) mode with the power supply connected to the domestic electricity network (device charging) since it's not possible to filter out the impurities of the external network.

To access to the functionality of the EMG module, simply click on the EMG icon in the I-TECH PHYSIO EMG main menu: the *channel setup* menu will be displayed with a screen similar to the one in the figure below.

The operating menù of the 4/EMG module is as follow:

Parameter	Description
CH1 Channel: ON\OFF	It's possible to activate or deactivate this channel.
CH2 Channel: ON\OFF	It's possible to activate or deactivate this channel.
CH1 Amplification: X1, X2, X4, X8	It's possible to amplify the input signal (bioelectronic signal of the patient) X1, X2, X4, X8
CH2 Amplification: X1, X2, X4, X8	It's possible to amplify the input signal (bioelectronic signal of the patient) X1, X2, X4, X8
Work mode: UTH\TAR	It's possible to select the work mode, between UTH (Under Threshold) and TAR (Target, Keep Level)
Work level: from 10% to 100%	It's possible to set the maximum percentage when the desired contraction level is reached
Work margin: from 2% to 10%	It's possible to set the tolerance when the desired contraction level is reached (only for the TAR (Target, Keep Level) mode)
Period dimension: 0,1s 0,2s 0,5s 1s	It's possible set the period on which amplitude calculations of the signal taken are performed (ds 0,1s 0,2s 0,5s a 1s)
CH1 Buzzer: ON\OFF	It's possible activate or deactivate the acoustic signal of work

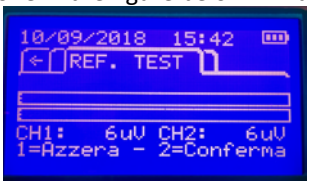
Clean the skin near the area to be treated; connect the amplifier to I-TECH PHYSIO EMG; connect the 2 concentric electrodes to the cables with dedicated connector and the reference pregelled electrode squared to the 2mm male plug. Pay attention when placing the concentric electrodes near the muscular belly, while the square electrode (mass reference) should be

positioned in an area where there is proximity to a bone tissue (for example on the wrist or ankle).

Reference Test Mode

Once the parameters of the previous screen have been set, pressing the directional arrow on the right accesses the "*reference test*" menu, this function allows the recording of the reference contraction for each channel (each channel is associated with a pair of concentric electrodes and a common mass) .

A screen similar to the one in the figure below will appear:



In this mode it is necessary to record the reference contraction level to work on. When the desired threshold has been reached, press 2 to confirm and go to the next screen, otherwise reset the counter by pressing 1 and repeat the operation.

Work Mode

In this mode a visual and sound feedback is supplied to the patient, as a percentage of the reference contraction value, for each channel, which was previously recorded. The screens are different depending on the type mode previously selected UTH (Under Threshold) or TAR (Target, Keep Level).

Example: the figure below shows the UTH (Under Threshold) mode, the system shows 2 vertical dashed bars that indicate the threshold level set on each channel. Proportionally to the level of contraction a horizontal bar increases or decreases its amplitude with a maximum value corresponding to the intensity of the reference contraction.

While the following figure shows the TAR (Target, Keep Level) mode, the two dashed vertical lines indicate the maximum and minimum strength level within which the user must stand to respect the level maintenance condition.

The distance between the dashed vertical bars corresponds to the precision required to maintain the desired level. This precision can be changed by accessing the *channel setup* menu. *Work margin*, described above. The Target value set in the TAR (Target, Keep Level) section is calculated as the average of the amplitudes of the active channels.

Maintenance

If used following the instructions given in this user guide, the equipment does not require any particular kind of maintenance.
It is recommended that the manufacturer carries out a functional test every 24 months. The manufacturer does not consider the I-TECH PHYSIO 4/EMG device repairable by any personnel outside the company. Each operation of the kind perpetuated by personnel not authorized by the manufacturer will be considered as tampering the device, freeing the manufacturer from granting warranty and from any danger that the user or the operator may be exposed to.

CLEANLINESS

Clean the device using only a dry soft cloth. Resistant strains can be removed using a sponge soaked in solution of water and alcohol, do not use detergents or other aggressive agents.

ATTENTION: the device must not be cleaned while the device is in operation. Disconnect the device from the charger, disconnect all connection cables and perform cleaning with the device switched off.

Device not subject to sterilization.

Note:

- Never use solvents for cleaning. Cleaning agents cause damage to the device.
- Attention to the need for periodic maintenance, especially:
  - inspection of main body for cracks, which may allow the ingress of conductive fluid;
  - inspection of the main cable and associated connectors.

Only follow the instructions above, contact the manufacturer for any other cleaning / maintenance operations.

TRANSPORTATION AND STORAGE

Protect the device from high temperature, direct daylight and liquids.
The devices are designed to operate under the following environmental conditions:

Temperature	from +10 to + 40 °C
Relative humidity	from 15 to 93%
Pressure	from 500 to 1060hPa

Precaution for the storage

There is no particular precaution to be taken during transportation of the device, since I-TECH PHYSIO 4/EMG is a portable device. In any case it is recommended to store I-TECH PHYSIO 4/EMG and its accessories in the supplied carrying bag after each treatment.

Precaution for the storage

Store the device in a cool, well-ventilated place. Do not store heavy objects on the device. It is recommended to switch off I-TECH PHYSIO 4/EMG at the end of each treatment and to remove the cables from the connectors. I-TECH PHYSIO 4/EMG should be kept in the supplied carrying bag, together with the rest of the equipment supplied. The equipment is protected up to the following environmental conditions (with and without the packaging supplied):

Temperature	from +5 to + 40 °C
Relative humidity	from 15 to 93%
Pressure	from 500 to 1060hPa

N.B. Disconnect the cables, before storing the device into its carrying bag. If not, the cables could bend excessively near the connectors. It could severely damage the cables.

Troubleshooting

In the event of malfunctions or problems in the use of I-TECH PHSYIO 4/EMG, check the following:

- **I-TECH PHSYIO 4/EMG cannot be turned on.** Check the state of charge of the battery (see next paragraph *Battery charging*). If the problem persists, contact the manufacturer.
- **I-TECH PHSYIO 4/EMG does not transmit electric impulses**. Check the status of all the connections, cables and applicators as indicated in this manual. If the problem persists, contact the manufacturer.
- **I-TECH PHSYIO 4/EMG switches off during operation**. It is recommended to check the battery status, contact the manufacturer.

Battery charging

Indication on the display of the battery charge status:

 Batteries charged

 Batteries partially discharged

 Batteries discharged

In case of low or insufficient charge the display warns with the message BATTERY DISCHARGED.
In this case, connect the battery charger to the relative connector on the small rear panel of the device.

ATTENTION: at the end of the charge wait at least 30 minutes before switching on the device; in order to allow the cooling of the battery pack, overheated during charging and the closure of the integrated safety system that prevents the device from turning on.

To replace the battery it's necessary contact the manufacturer or a specialist technical center. Replace the battery only with the model provided by the manufacturer.

Do not use the battery charger if:

- the plug is damaged or parts of it are broken;
- it has been exposed to rain or any other type of liquid;
- the components have been damaged by a fall.

Use a dry cloth to clean the battery charger. Do not open the battery charger: it does not contain repairable parts.

Disposal

The I-TECH PHYSIO 4/EMG devices, was designed and engineered to have minimal negative environmental impact, in consideration of its performance and safety requirements, following the disposition given by the European Directive 2012/19/EU, regarding the waste of electrical and electronic equipment.
Rigorous standards were followed in order to minimize the amount of waste, use of toxic materials, noise, non-required radiation and energy consumption.
A deep research on the optimization of machine performances guarantees a significant consumption's reduction, in accordance to the saving energy principles.

This symbol means that the product shall not be disposed as domestic waste.

The correct disposal of obsolete equipment, accessories and most of all of batteries contributes in preventing possible negative consequences on human and environmental health.
The user must dispose of scrap equipment by taking it to a recognized center for recycling of electrical and electronic equipment.
For further information on the obsolete equipment disposal please contact the dedicated disposal service or the shop in which the device was bought.

Warranty

IACER Srl guarantees a warranty period from the purchasing date for I-TECH PHYSIO4/EMG device, unless information contained in this manual regarding installation, use and maintenance is strictly adhered. The wearing parts are not included in the warranty, unless of visible manufacturing defects. The warranty is void in case of tampering of the device and in case of intervention on the same by personnel not authorized by the manufacturer or by the authorized dealer.
As established by the Medical Device Directive 93/42/EEC, the manufacturer is obliged to trace at any time the equipment supplied to intervene promptly, if necessary, as a result of manufacturing defects.
The warranty conditions are those described in the following paragraph Warranty conditions*. The warranty is provided by IACER.*
Should you need to return the goods then please pack the device and all the accessories so that it won't be damaged during transportation. In order to be entitled to the warranty assistance, the purchaser must enclose to the device a copy of the purchasing receipt, proving origin and purchasing date.
For more information on the warranty please contact the distributor or vendor, in order to check the norm and standard in force in your Country, or ultimately the manufacturer IACER Srl.

Warranty conditions

1) Should assistance be needed, enclose the purchasing receipt when sending the device to the manufacturer.

2) The warranty period is valid only on the electronic parts. The warranty will be granted by the shop or directly by the manufacturer.
3) The warranty covers only the product damages, which causes its malfunctioning.
4) Warranty means that only the manufacturing defect components or material are covered by reparation or free substitution, hand work included.
5) Warranty is not applied to damages caused by negligence or use not compliant to the given instructions, by intervention on the device from personnel not authorized, accidental causes or negligence form the purchaser.
6) Warranty is not applied in case of damages caused by unsuitable power supplies.
7) Warranty does not apply to wearing parts.
8) Warranty does not include transportation costs which have to be covered by the purchaser.
9) After the warranty period, the warranty is no more applicable. In this case all the assistance interventions will be performed by debiting the costs of the substitution of the parts, the hand work and the transportations costs.
10) The court of Venice has exclusive jurisdiction over any dispute.

Support

The manufacturer is the one and only allowed to operate with technical assistance. For any technical assistance contact:

I.A.C.E.R. S.r.l.
Via Enzo Ferrari, 2 • 30037 Scorzè (VE)
Tel. 041.5401356 • Fax 041.5402684

Technical documentation related to repairable parts could be attached, but only with previous authorization from the manufacturer and only after giving proper training to the staff employed in technical assistance.

Spare part

The manufacturer makes available at any time the original spare parts for the equipment. Please contact:

I.A.C.E.R. S.r.l.
Via Enzo Ferrari, 2 • 30037 Scorzè (VE)
Tel. 041.5401356 • Fax 041.5402684

In order to preserve the warranty, the functionality and the security and safety of the product, it is highly recommended to use exclusively the spare parts given by the manufacturer (see also paragraph *Warnings*).

Electromagnetic interferences and electromagnetic compatibility tables

The I-TECH PHYSIO 4 and I-TECH PHYSIO EMG devices has been designed and manufactured according to the international ELECTROMAGNETIC COMPATIBILITY legislation EN 60601-1-2:2015 with the aim of providing adequate protection from harmful interference when installed in homes and health establishments.

According to operating principles the device does not generate significant radio frequency energy and is adequately immune to radiated electromagnetic fields: under such conditions it does not detrimentally harmful interfere with radio-electric communications, electro-medical equipment for monitoring, diagnosis, therapy and surgery, office electronic devices such as computers, printers, photocopiers, fax machines, etc. or any electric or electronic equipment used in these environments, as long as the equipment complies with the ELECTROMAGNETIC COMPATIBILITY directive.

In any case it is recommended to use the equipment at least at 3 meters away from televisions, monitors, cellphones or any other electronic equipment.

For more details consult the compatibility tables in at the end of the manual.

COMPATIBILITY ELECTROMAGNETIC TABLES

Guidance and manufacturer's declaration – ELECTROMAGNETIC EMISSIONS – FOR ALL EQUIPMENT AND SYSTEMS		
The I-TECH PHYSIO 4/EMG is intended for use in the electromagnetic environment specified below. The customer or the user of the I-TECH PHYSIO 4/EMG should assure that it is used in such an environment.		
Emissions Test	**Compliance**	**Electromagnetic environment - guide**
RF emissions CISPR 11	Group 1	The I-TECH PHYSIO 4/EMG uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The I-TECH PHYSIO 4/EMG is suitable for domestic establishment and in establishment directly connected to the public low-voltage power supply network that supplis buildings used for domestic purposes.
Harmonics emissions IEC 61000-3-2	Class A	
Voltage fluctuation/flicker emissions IEC 61000-3-3	Compliant	

Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR ALL EQUIPMENT AND SYSTEMS			
The I-TECH PHYSIO 4/EMG is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment			
Immunity test	**Test level IEC 60601**	**Compliance level**	**Electromagnetic environment - guide**
Electrostatic discharge (ESD) IEC 61000-4-2	±6kV; +8kV in contact ±8kV; +15kV on air	±6kV; +8kV in contact ±8kV; +15kV on air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst	±2kV for power	±2kV for power supplies	Mains power quality should be that of a typical

Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR ALL EQUIPMENT AND SYSTEMS			
The I-TECH PHYSIO 4/EMG is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment			
Immunity test	**Test level IEC 60601**	**Compliance level**	**Electromagnetic environment - guide**
IEC 61000-4-4	supplies lines	lines	commercial or hospital environment.
Overvoltage IEC 61000-4-5	±1kV line	±1kV line	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supplì input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0,5 cycles <5% U_T (>95% dip in U_T) for 1 cycle 70% U_T (30% dip in U_T) for 25 cycle <5% U_T (>95% dip in U_T) for 5s	<5% U_T (>95% dip in U_T) for 0,5 cycles <5% U_T (>95% dip in U_T) for 1 cycle 70% U_T (30% dip in U_T) for 25 cycle <5% U_T (>95% dip in U_T) for 5s	Main power quality should be that of a typical commercial or hospital environment. If the user of I-TECH PHYSIO 4/EMG requires continued operation during power mains interruptions, it is recommended that I-TECH PHYSIO 4/EMG be powered from an uninterruptible power supply (UPS) or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30A/m	30A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
Note: U_T is the A.C. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR EQUIPMENT AND SYSTEMS THAT ARE NOT LIFE-SUPPORTING			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment			
Immunity test	**Test level IEC 60601**	**Conformity level**	**Electromagnetic environment - guide**
Portable and mobile RF communications equipment should not be used near any part of the device, including cables, except when the recommended separation distance is respected, calculated from the equation applicable to the frequency of the transmitter.			
			Recommended separation distance
Conducted RF IEC 61000-4-6	$3V_{eff}$ from 150kHz to 80MHz $6V_{eff}$ from 150kHz to 80MHz for ISM band	$3V_{eff}$ ([V_1] V) $6V_{eff}$ ([V_1] V)	$d = \left[\frac{3,5}{V_1}\right]\sqrt{P} = d = \left[\frac{12}{V_1}\right]\sqrt{P}$ for ISM band
Radiated RF IEC 61000-4-3	3 V/m from 80MHz to 2,7GHz	3V/m [E_1] V/m	$d = \left[\frac{12}{E_1}\right]\sqrt{P}$ from 80 MHz to 800 MHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$ from 800 MHz to 2,7 GHz
Radiated RF for radio comunication devices IEC 61000-4-3	3 V/m from 80 MHz to 6 GHz	3V/m [E_1] V/m	$d = \left[\frac{6}{E_1}\right]\sqrt{P}$ from 80 MHz to 6 GHz
where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, could be less than the compliance level in each frequency range. Interference may occur near equipment marked with the following symbol: 			
Note: 1) At 80 MHz and 800 MHz, the higher frequency range applies. 2) Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a) Field strengths from fixed RF transmitters, such as base stations for radio			

Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR EQUIPMENT AND SYSTEMS THAT ARE NOT LIFE-SUPPORTING
(cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which I-TECH PHYSIO 4/EMG is used exceeds the applicable RF compliance level above, I-TECH PHYSIO 4/EMG should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating I-TECH PHYSIO 4/EMG.
b) Over the frequency range 150kHz to 80MHz, field strengths should be less than [V_1] V/m.

Recommended separation distances between portable and mobile RF communications equipment for I-TECH PHYSIO 4/EMG that are not life-supporting

I-TECH PHYSIO 4/EMG is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of I-TECH PHYSIO 4/EMG can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and I-TECH PHYSIO 4/EMG as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	***Separation distance according to the frequency of transmitter (m)***			
	$from\ 150kHz\ to\ 800\ MHz$	$from\ 150kHz\ to\ 800\ MHz$ *(ISM band)*	$from\ 80MHz\ to\ 800\ MHz$	$from\ 800MHz\ to\ 6\ Hz$ *(a RF wireless for radio comunication devices)*
0,01	0,12	0,2	0,12	0,23
0,1	0,38	0,63	0,38	0,73
0,2	–	–	–	–
1	1,20	2,0	1,20	2,30
1,8	–	–	–	–
2	–	–	–	–
10	3,80	6,3	3,80	7,30
100	12,00	20	12,00	23,00

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Nota

1) At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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