I-TECH
MEDICAL DIVISION

MIO-CARE
TENS, FITNESS

I-TECH
MEDICAL DIVISION
USER MANUAL

Electrotherapy model LT3016, LT3016A

MIO-CARE

TENS, FITNESS

I-TECH
MEDICAL DIVISION

WARNING: MIO-CARE IS A MEDICAL DEVICE.

Consult your doctor before using MIO-CARE, if you suffer from health problems.

Read carefully the user and the electrode positioning manuals before using MIO-CARE.

Read carefully contraindications and warnings.

Manufacturer

Shenzhen Dongdixin Technology Co., Ltd.

Floor 1-2, No.3 Building, Fanshen Xusheng Industrial Estate

Xilixiaobaimang 518108 Nanshan District, Shenzhen P.R. China

(CE certificate n° HD 60147882 0001 issued by TÜV Rheinland LGA Products GmbH notified body n°0197).

Authorised representative

Shanghai International Holding Corp. GmbH (Europe)

Eiffestraße 80, 20537 Hamburg, Germany

Importer

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

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Declaration of conformity

Shenzhen Dongdixin Technology Co., Ltd
Floor 1-2, No.3 Building, Fanshen Xusheng Industrial Estate
Xilixiaobaimang 518108 Nanshan District, Shenzhen P.R. China
herewith declares under its own responsibility, that the product
Model: **LT3016**, Name: **MIO-CARE TENS**
Model: **LT3016A**, Name: **MIO-CARE FITNESS**
has been designed and manufactured according to the European Medical Device Directive 93/42/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 0197

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

0197 – TÜV Rheinland LGA Products GmbH

Tillystraße 2 – 90431 Nürnberg, Germany

Certificate n°: HD 60147882 0001

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

Classification

From now on, for the sake of simplicity, in this user manual, reference will be made to the device MIO-CARE meaning the devices model LT3016, name MIO-CARE TENS and model LT3016A, name MIO-CARE FITNESS.

The MIO-CARE has the following classification:

- class IIa (Directive 93/42/EEC, Annex IX, rule 9, 10 and further amendments);
- class II with BF type applied part (classification EN 60601-1);
- equipment protection level IP22 against liquid and dust penetration;
- equipment and accessories not subject to sterilization;
- equipment unsuitable for use in presence of a flammable anesthetic mixture containing air, oxygen and nitrous oxide;
- equipment suitable for continuous operation;
- equipment unsuitable for outdoors use.

Purpose and scope

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

The MIO-CARE electronic stimulator is a medical device specifically intended for domestic use and is targeted to adults, who acquired the specific knowledge to use the device by reading the present manual. It is also intended to be used by therapist, by personal trainer in a center or private clinic and by health professional in aesthetic center.

MIO-CARE is used to apply electrical micro impulses which create energy; this energy, modulated with different parameters specific for different impulses, can give the patient many benefits from pain relief to muscles relaxation, from

muscles strengthening to drainage, from isotonic exercises to hematomas' treatment, to the treatment of the imperfections using the beauty programs.
The patient population intended for electrotherapy treatment using the MIO-CARE device includes patients of both genders, men and women, of age (unless otherwise indicated by medical doctors). For further details, please refer to the *Contraindications* section.
The CE0197 mark is only for the medical programs (see the following paragraphs related to the detailed description of the programs).

Technical features

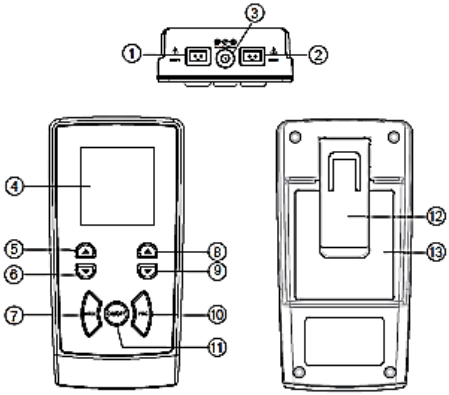
Characteristics	Specifications	
Power supply	Rechargeable batteries AAA Ni-MH 4.8V 800mAh	
Recharger	power supply line AC 100-240V, 50/60Hz, output DC 6.0V,300mAh max*	
Isolation (EN 60601-1)	II	
Applied part (EN 60601-1)	BF	
Protection level	IP22	
Applied part to the patient	Electrodes	
Dimensions (length x height x depth)	136x61x21mm	
Weight main body	220gr including batteries	
Layout	ABS	
Programs' number	55 total, divided into: – N. 20 TENS – N.15 BEAUTY – N.20 FITNESS	
Number output channel	2 independent and galvanically isolated	
Functioning	Continuous	
Output voltage	Setable, max output voltage 92V with 500 Ohm of load	
Impulse	Rectangular, biphasic and compensated	
Frequency	From 1 to 150Hz	
Impulse's width	From 50 to 300µs	
Therapy	Time depending on the program	
Display	Reflective and illuminated LCD display	
Command	ABS keyboard with 7 keys	
Conditions of use	Environmental temperature	From +5° to +40°C
	Relative humidity	From 30% to 75%
	Atmospheric pressure	From 700 to 1060hPa

Characteristics	Specifications	
Storage and transportation conditions	Environmental temperature	From -10° to +55°C
	Relative humidity	From 10% to 90%
	Atmospheric pressure	From 700 to 1060hPa

WARNING: the device has an output current over 10mA.

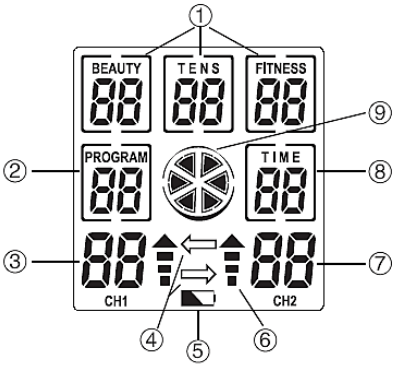
* Use only the battery recharger given by the manufacturer or by IACER Srl. The use of other recharger could seriously compromise the security and safety both of the patient and of the device.
Expected useful life of the device is set in 3 years, meanwhile the expected useful life of the electrodes is set in 10/15 uses.

Device and commands description



1. CH1 output
2. CH2 output
3. Battery charger connector
4. Display
5. Increase intensity CH1
6. Decrease intensity CH1
7. Next program (only for MIO-CARE TENS), program group selection (MIO-CARE FITNESS)
8. Increase intensity CH2
9. Decrease intensity CH2
10. Previous program (only for MIO-CARE TENS), program group selection (MIO-CARE FITNESS)
11. Switch device ON/OFF or stop the program
12. Belt clip

13. Battery compartment



1. PRG group selection
2. Selected program
3. CH1 intensity
4. Active channels
5. Low battery status
6. Next phase
7. CH2 intensity
8. Countdown timer
9. Device running

Program Indicates the program chosen (2).

The rotor, changing every second, indicates that the device is running (9).

Time Indicates the amount of time left before the program ends (8).

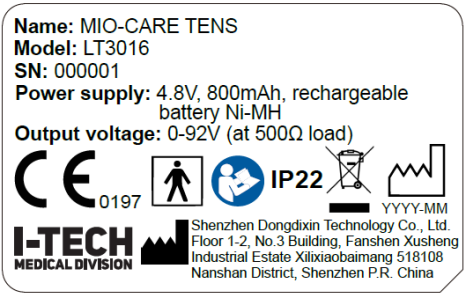
Warns the user to increase the intensity by 1 or 2 units (using the ▲ key) (6).

Indicates which of the 2 channels is active: the left arrow indicates that CH1 is active, the right arrow indicates that CH2 is active, both arrows together indicate that both CH1 and CH2 are active (4).

CH1 Indicates the intensity selected for channel 1 (3).

CH2 Indicates the intensity selected for channel 2 (7).

Indicates low battery (5).



Symbol	Description
I-TECH MEDICAL DIVISION	Importer's logo.
CE 0197	Product CE certification released by Notified Body n°0197.
	Applied part type BF.
	Manufacturer
EC REP	Authorised representative.
	Importer.
	Manufacturing date
	Attention, consult operating instructions.
	The product must be disposed as "electronic waste", in accordance to WEEE Directive on waste electrical and electronic equipment.
IP22	Medical device protected against the penetration of solids (with a diameter *d≥12,5mm*) and against the vertical drops when the device is kept at 15° from its normal functioning position.
	Relative humidity (transport and storage, packaging).

Symbol	Description
	Admission temperature (transport and storage, packaging).
	Atmospheric pressure (atmospheric pressure for transport and storage, packaging)

Package content

The MIO-CARE box contains:

- n° 1 mainframe;
- n° 2 connection cables, 2 clips each, for the transmission of electrical impulses;
- n°4 splitting leads, 2 clips each, for doubling the area covered by the electrodes;
- n° 1 set of 4 pre-gelled electrodes 41x41mm;
- n° 1 set of 4 pre-gelled electrodes 40x80mm;
- n°1 battery charger;
- n° 1 bag for the transportation;
- n° 1 user manual;
- n° 1 user manual of the electrodes' positions.

Introduction to the technology

Electrostimulation consists of the transmission of electric micro-impulses to the human body.
Fields of application of electrostimulation are pain therapy, 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 displayed on the MIO-CARE screen for each channel in a progressing scale from 0 to 50.
Once the initial intensity has been set, MIO-CARE will proceed until it reaches the end of the program and does not require any further action from the user.
The types of impulses can be classified as follows:

1. **TENS 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. We recommend staying below that limit.
2. **Lipolysis/drainage impulse:** the "pump" effect is produced by sequential tonic contractions. The intensity must be enough to produce these contractions: the greater the contraction is, the greater the pump effect will be. But beware: 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 and will not be traumatic.
3. **Warming-up impulse:** stimulation intensity must be increased gradually to improve progressively the metabolism of the muscle concerned. A bit like a car: the engine needs warming-up before taking it to full speed.
4. **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. 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 therefore your performance.

5. **Massage, winding down, active recovery impulse:** intensity must be adjusted gradually to massage the muscle treated. The level of intensity should be enough to obtain a comfortable massage. There is no need to endure high intensity levels in this case as it is meant to be a massage, meaning that intensity can be increased gradually without excesses.
6. **Capillarization 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.

Contraindications

The device must not be used in presence of cancerous injuries in the area to be treated. The stimulation should not be applied to infected, swollen or inflamed areas and in case of rashes (phlebitis, thrombophlebitis, etc.).
It is absolutely forbidden to use MIO-CARE if the patient suffers from severe arrythmia or has a pacemaker, suffers from epilepsy, heart-related pathologies, phlebitis in place, thrombophlebitis, in feverish state, anxiety or serious illnesses, abdominal or inguinal hernias or in case of severe injuries in the area to be treated (except in case of medical prescription).
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.***

MIO-CARE has been designed and manufactured to be operated exclusively with the internal, rechargeable batteries.

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, it contains small pieces that could be swallowed;
- 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 or by IACER Srl, and take care to avoid the exchange of electrodes between different users. MIO-CARE has been tested and guaranteed for the use only with the electrodes supplied by the manufacture or by IACER Srl;
- to use ONLY accessories supplied by device manufacturer or by IACER Srl. **Only use battery chargers supplied by the manufacturer or by IACER Srl**; the use of battery chargers not supplied by the manufacturer or by IACER Srl 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 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 by persons known to be unsound-minded, or suffering from sensibility disorders, permanently or temporarily disabled unless assisted by qualified personnel (e.g. a doctor or therapist); by persons younger than 15 years old or not adequately educated about the device use by an adult person;
- to use the device in presence of signs of deterioration of the device itself, cables and/or electrodes: please contact the dealer or by IACER Srl following the instructions given in the paragraph *Support.* Control carefully the integrity of the device before each use;
- 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) or genitals, 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 stimulate the thyroid or apply stimulation on the neck and mouth, as this stimulation could cause 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.

Warning:

- insufficiently sized electrode sections can cause skin reactions or burns;
- do not use damaged electrodes even if they well adhere to the skin;
- be sure that the electrodes well adhere to the skin. Repeated use of the same electrodes can compromise the safety of the stimulation, in fact it can cause skin redness that can last for many hours after stimulation;
- pay attention to use connection cables with children/young people: strangulation danger;
- do not mix connection cables up with earphones or other devices and do not connect the cable to other equipment;
- keep right distance between electrodes: the contact between electrodes could cause wrong stimulations or irritations/burns;
- ***stimulation intensity and electrodes position should be suggested by the prescriber doctor***;
- during treatment with **round** and **41x41 mm electrodes**, **current density** may be in **excess of 2 mA/cm²** for each electrode. In these cases, take special care regarding any skin redness.

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 authorized personnel;
- the environmental electrical installation to which MIO-CARE is connected is compliant to the national laws;
- the instructions for use contained in this manual are strictly followed.

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

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

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 MIO-CARE with metallic osteosynthesis devices. IF YOU HAVE ANY DOUBTS REGARDING THE DEVICE USE CONSULT YOUR DOCTOR.

Patient preparation

Before using MIO-CARE clean the skin of the area to be treated; with the cable disconnected from MIO-CARE, 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 the impulse transmission cables to the relative jacks (Channel 1 and/or Channel 2), then turn MIO-CARE on.

Splitting leads use: please use splitting leads if you want to double electrodes number for each channel. Connect the splitting cable jacks to the self-adhesive electrodes, with the cable disconnected from MIO-CARE; position the self-adhesive electrodes on the skin (see photos of electrode positions in the *Positions manual*); connect the splitting leads cables to the impulse transmission cables that are connected to the relative jacks (Channel 1 and/or Channel 2), then turn MIO-CARE on.

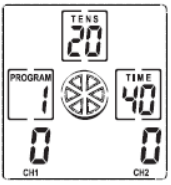
Make sure that MIO-CARE is switched off **before disconnecting the electrodes** at the end of the treatment.

Device use

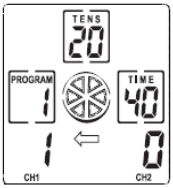
Operating instructions

It is recommended reading the entire user manual before using.

1. Turn MIO-CARE on using the **ON/OFF** button.
2. The display shows the number of the programs on the upper side, the selected program number on the middle-left side and on the right the program time:



3. Select the program group using the **MODE** button (no selection is necessary for the TENS model).
4. Select the program using the **PRG** key (for the TENS model select the program using the **PRG+** and **PRG-** keys).
5. To start the session press ▲ key of the selected channel CH1 or CH2 and increase the output current intensity till the personal tolerance level is reached (stimulation comfort). [ ] icon starts blinking on the display. The ▼ key can be used to reduce the power if the intensity is too high.



6. Stimulation intensity is showed on the display in a scale progressing from 0 to 50.
7. At the end of the program (always pre-set by the manufacturer), the stimulator will return to the initial screen of the selected program setting the intensity to zero.
8. To turn MIO-CARE off press **ON/OFF** key.

***Stop program* command**: pressing the ON/OFF button once whilst the program is running interrupts the program.

WARNING! MIO-CARE will enter into *sleeping mode*, if no key is press for longer than 2 minutes to preserve battery.

TENS programs

WARNING! It must be remembered that an electronic stimulator is a very effective analgesic instrument and that pain can indicate various types of medical conditions!

The programs described in this paragraph are analgesic. You are advised to read the ENTIRE manual carefully before using MIO-CARE.

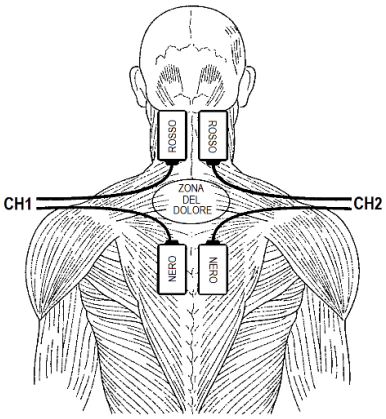
Moreover, **remember that pain is a SIGN: consult a doctor to identify the medical condition before using MIO-CARE!**

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 at maximum values with antidromic action and consequently an immediate local anaesthetic effect.

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.

Figure 1 – Electrodes' positioning.

The electrodes have to be positioned to form a square over the painful zone by using the channel 1 and 2 as shown above in *Figure 1* (red or black up or down are not important for the therapy purposes, follow the indications in 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.

Programs specifications

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
1	Yes	Fast TENS	Total time 40min Frequency 90Hz Impulse width 50µs		
2	Yes	Endorphinic TENS	Total time 30min Frequency 1Hz Impulse width 200µs		
	Yes	TENS at maximum values	Total time 3min Frequency 150Hz Impulse width 200µs		
4	Yes	Anti-inflammatory	Total time 30min Frequency 120Hz Impulse width 50µs		

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
5*	Yes	Neck pain/ Headache	Total time 20min Frequency 90Hz Impulse width 60µs	Total time 5min Frequency 2Hz Impulse width 150µs	Total time 10min Frequency 90Hz Impulse width 60µs
6*	Yes	Back/Sciatic pain	Total time 20min Frequency 90Hz Impulse width 50µs	Total time 20min Frequency 60Hz Impulse width 60µs	
7*	Yes	Sprains/ Bruises	Total time 10min Frequency 110Hz Impulse width 50µs	Total time 10min Frequency 90Hz Impulse width 50µs	Total time 10min Frequency 70Hz Impulse width 60µs
8	Yes	Vascularizа-tion	Total time 20min Frequency 2Hz Impulse width 200µs		
9*	Yes	Muscle relaxant	Total time 10min Frequency 4Hz Impulse width 250µs	Total time 10min Frequency 6Hz Impulse width 200µs	Total time 10min Frequency 2Hz Impulse width 300µs
10	Yes	Haematomas	Total time 30min (5s 30 Hz–200µs + 5s 50 Hz–150µs + 5s 100 Hz–120µs) x 120 cycles		
11*	Yes	Atrophy prevention	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 10min (3Hz-250µs x 7s 80% + 1Hz 250µs x 3s 100% + 20Hz-250µs x 5s 80%) x 40	Total time 10min (3Hz-250µs x 7s 80%+ 1Hz 250µs x 3s 100% + 30Hz-250µs x 5s 80%) x

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
				cycles	40 cycles
12*	Yes	Atrophy – trophism rehabilitation	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 15min: (3Hz-250µs x 7s 80%+ 1Hz 250µs x 3s 100% + 40Hz-250µs x 5s 75%) x 60 cycles	Total time 10min: (3Hz-250µs x 7s 80%+ 1Hz 250µs x 3s 100% + 50Hz-250µs x 5s 75%) x 40 cycles
13*	Yes	Hand and wrist pain	Total time 15min Frequency 70Hz Impulse width 60µs	Total time 15min Frequency 90Hz Impulse width 50µs	Total time 10min Frequency 110Hz Impulse width 50µs
14*	Yes	Plantar stimulation	Total time 15min Frequency 70Hz Impulse width 60µs	Total time 15min Frequency 2Hz Impulse width 150µs	Total time 10min Frequency 90Hz Impulse width 50µs
15*	Yes	Epicondylitis	Total time 20min Frequency 90Hz Impulse width 50µs	Total time 10min Frequency 70Hz Impulse width 60µs	Total time 10min Frequency 50Hz Impulse width 90µs
16*	Yes	Epitrochlea	Total time 20min Frequency 90Hz Impulse width 50µs	Total time 20min Frequency 70Hz Impulse width 60µs	
17*	Yes	Periarthritis	Total time 1min Frequency 150Hz Impulse width 200µs	Total time 30min Frequency 90Hz Impulse width 60µs	Total time 10min: (3Hz-200µs x 7s 50%+ 1Hz 200µs x 3s 60% + 30Hz-200µs x 5s 50%) x

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
					40 cycles
18	Yes	Microcurrent	Total time 30min Frequency 90Hz Impulse width 50µs		
19*	Yes	Stress incontinence	Total time 4min Frequency 8Hz Impulse width 150µs	Total time 5min: (3Hz-150µs x 5s 80%+ 70Hz-150µs x 5s 70%) x 30 cycles	
20*	Yes	Urgency incontinence	Total time 4min Frequency 8Hz Impulse width 150µs	Total time 5min: (3Hz-150µs x 5s 80%+ 40Hz-150µs x 5s 75%) x 30 cycles	

*When the program shifts to the following phase, the device emits an acoustic signal indicating the user to increase the intensity of the channel and at the same time the icon  starts blinking near the intensity indicator.

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

TENS1 • Fast TENS (medical program)

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 fibres) until they reach the central nervous system where the impulses are interpreted as pain. Conventional TENS activates large-diameter nerve fibres, blocking the path of small-diameter nerve fibres at the spine. Therefore, this action is mainly taken against 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 daily pain**. The average number required to benefit from the treatment is 10/12 per day (no contraindications in doubling this amount).

The program can be repeated at the end of the session for particularly persistent pain. Due to the nature of the impulse the patient may experience an addictive

effect, meaning that the impulse will be felt less and less: if necessary, the intensity can be increased by one level to counter this effect.
Session duration: 40 minutes (no less than 30/40 minutes), in a single phase.
Electrodes' positioning: form a square above the painful area as shown in *Figure1*.
Intensity: to be adjusted in order to have a good solicitation of the stimulated part, but not over the pain threshold.

TENS2 • Endorphinic TENS (medical program)
This kind of stimulation produces two types of effects according to how the electrodes are positioned: 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 1* 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: 30 minutes in a single phase, daily frequency.
Electrodes' positioning: photo 08 of the *Positions manual*; do not position the electrodes close to inflamed areas.
Intensity: to be adjusted in order to have a good solicitation of the stimulated part, the sensation must be similar to a massage.

TENS3 • TENS at maximum values (medical program)
This program blocks pain impulses peripherally creating a proper anaesthetizing effect in the treated area. This type of stimulation is suitable for injuries or bruises when rapid action is required. That is the reason why such stimulation is undoubtedly the least tolerated, but it 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 in a single phase.
Electrodes' positioning: form a square above the painful area as shown in *Figure1*.
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).

TENS4 • Anti-inflammatory (medical program)

Program recommended for inflammatory conditions. To be applied until the inflammatory state is lessened (10-15 applications, once a day; the daily treatments can be doubled if required).
Session duration: 30 minutes.
Electrodes' positioning: identified the area to be treated, position the electrodes as shown in *Figure 1*.
Intensity: to be adjusted until a tingling feeling is produced in the area treated; avoid contracting the surrounding muscles.

TENS5 • Neck pain/Headache (medical program)
Specific program for the treatment of pain in the neck area. 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: 35 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; over this limit the stimulation does not become more effective, just more irritating, so it is best to stop before that point.

WARNING: the device varies stimulation parameters during the program. The current may be felt different: this is perfectly normal and is envisaged by the software: raise or lower the intensity according to your own sensitivity to reach a level of stimulation that is comfortable for you.

TENS6 • Back/Sciatic pain (medical program)
Specific program for the treatment of pain in the lumbar area or along the sciatic nerve, or both. 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. The first benefits can be seen after 15 to 20 treatments carried out daily; proceed with the treatment until the symptoms pass.
Session duration: 40 minutes.
Electrodes' positioning: photo 27 and 28 in the *Positions manual*.
Intensity: to be adjusted between the threshold of perception and pain.

TENS7 • Sprains/Bruises (medical program)

The program develops its effectiveness after this type of injury by inhibiting pain locally, producing three selectively acting, differentiated impulses. Until pain is lessened, the treatment is recommended daily (even 2/3 times a day).
Session duration: 30 minutes.
Electrodes' positioning: form a square above the painful area as shown in *Figure1*.
Intensity: to be adjusted between the threshold of perception and pain.

TENS8 • Vascularization (medical program)
Has a vascularizing effect on the treated area. Vascularization increases arterial flow and consequently aids the removal of allogenic substances and helps to restore normal physiological conditions. Do not position the electrodes close to inflamed areas. Daily application is recommended, the number of applications is not defined; the program can be used to reduce pain.
Session duration: 20 minutes.
Electrodes' positioning: photo from 25 to 33 in the *Positions manual*; do not position the electrodes close to inflamed areas.
Intensity: to be adjusted between the perception threshold and slight discomfort.

TENS9 • Muscle relaxant (medical program)
Program used to speed up the recovery of muscle function after intense training or strain from work; the effect is immediate. Two treatments per day for three or four days are recommended.
Session duration: 30 minutes.
Electrodes' positioning: photo from 01 to 28 in the *Positions manual*.
Intensity: to be adjusted in order to have a moderate muscle solicitation.

TENS10 • Haematomas (medical program)
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: 30 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 1*.
Intensity: to be adjusted between the threshold of perception and pain, without causing muscle contraction.

TENS11 • Atrophy prevention (medical program)
Program created to maintain muscle trophism. This treatment concentrates on muscle toning, paying particular attention to slow-twitch fibres. For this reason, it

is particularly indicated for patients recovering from an accident or an operation, since it prevents the reduction of muscle trophism caused by physical inactivity. The concerned muscle area can be stimulated with daily applications of medium intensity; if you increase the intensity, leave a day of rest between applications to allow the muscles to recover.
Session duration: 24 minutes.
Electrodes' positioning: photo from 01 to 20 in the *Positions manual.*
Intensity: to be adjusted to produce good muscle contraction in the treated area.

TENS12 • Atrophy – trophism rehabilitation (medical program)
This program acts selectively on slow-twitch fibres. For this reason, it is ideal for recovering muscle trophism after a long period of inactivity or an accident. This program is to be carried out when loss of muscle tone has ALREADY occurred. Application on alternate days.
Session duration: 29 minutes.
Electrodes' positioning: photo from 01 to 20 in the *Positions manual.*
Intensity: in the first 2/3 weeks low, just enough to produce light muscle contractions; than progressively increase the intensity over the next two weeks (3rd and 4th week).

TENS13 • Hand and wrist pain (medical program)
This program is suitable for all types of hand and wrist pain: aching caused by strains, arthritis in the hand, carpal tunnel syndrome, etc. A combination of various types of square-wave impulses has a general analgesic effect on the area to be treated, in fact impulses at different frequencies stimulate different sized nerve fibres promoting an inhibitory action at spinal level.
Session duration: 40 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 1*.
Intensity: to be adjusted between the threshold of perception and pain, without causing muscle contraction.

TENS14 • Plantar stimulation (medical program)
This program has a relaxing and draining effect on the stimulated limb. 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: just a little bit over the perception threshold.

TENS15 • Epicondylitis (medical program)

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.

TENS16 • Epitrochlea (medical program)
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 epitrochlea. 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.

TENS17 • Periarthritis (medical program)
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).

TENS18 • Microcurrent (medical program)
The use of microcurrent is very similar to conventional TENS, the only difference being the very fine electric impulse used that is sometimes more suitable for the

sensibility of slightly anxious people or the more delicate parts of the body involved. It can generally be applied for everyday pains, bearing in mind that you should always first consult your doctor to identify the cause of the pain.
It could be considered a good all-purpose analgesic current, as it does not have any side effects (except slight skin redness after long applications) and has very few contraindications (those specified in the paragraph at the beginning).
Session duration: 30 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 1*.
Intensity: to be adjusted above the perception threshold.

TENS19 • Stress incontinence (medical program)
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: 9 minutes.
Electrodes' positioning: see probes user manual.
Intensity: to be adjusted above the perception threshold to produce light internal stimulation.

TENS20 • Urgency incontinence (medical program)
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: 9 minutes.
Electrodes' positioning: see probes user manual.
Intensity: to be adjusted above the perception threshold to produce light internal stimulation.

WARNING: when using programs TENS19 and TENS20, we recommend using probes that have been certified by a notified body as a "class IIa medical device". These probes are available among the vendor who sold you the MIO-CARE or IACER. If you want to use other probes, please first verify with the vendor that the probe in question reports the labels, in which there is stated that it is 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.

Treatment programs for TENS therapy

Pathology	Progr.	No. of treatments	Frequency of treatments	Electrodes' positioning reference
Arthrosis	TENS1+TENS2	Until pain reduction	Daily (TENS1 up to 2/3 times per day, TENS2 once a day)	On the painful are
Neck pain	TENS5	10/12	Daily, even 2 a day	Photo 25
Cervicogenic headache	TENS5	10/12	Daily, even 2 a day	Photo 25
Back pain	TENS6	10/12	Daily	Photo 25, but with the electrodes placed 10cm lower
Backache	TENS6	12/15	Daily	Photo 27
Sciatic pain	TENS6	15/20	Daily, even 2 a day	Photo 28
Cruralgia	TENS6	15/20	Daily, even 2 a day	Photo 18, with all the electrodes placed on the inside of the thigh
Epicondylitis	TENS15	15/20	Daily, even 2 a day	Photo 29
Hip pain	TENS1	10/20	Daily, even 2 a day	Photo 30
Knee pain	TENS1	10/20	Daily, even 2 a day	Photo 31
Ankle sprain	TENS3	5/7	Daily, up to 2/3 times a day	Photo 32
Carpal tunnel syndrome	TENS1	10/12	Daily, even 2 a day	Photo 33
Trigeminal neuralgia	TENS18	10/12	Daily	Photo 24
Wryneck	TENS1+TENS9	8/10	Daily, even 2 a day	Photo 25
Periarthritis	TENS17	15/20	Daily	Photo 26

The reference photo for the electrodes' positioning are available in the *Positions manual*.

IMPORTANT: in all these programs, stimulation intensity must be set between the impulse perception threshold and the one of the moment

in which the impulse begins to cause discomfort. Except for TENS17, the muscles around the treated area must not contract, but only produce slight “vibrations”.

N.B. read the specific instructions on TENS17 for the periarthritis program.

BEAUTY programs

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
1*	No	Firming up upper limbs and trunk	Total time 4min frequency 6Hz impulse width 200µs	Total time 15min: (3Hz-200µs x 7sec 80%+ 1Hz-200µs x 3 sec 100% + 20Hz-200µs x 5 sec 80%) x 60 cycles	Total time 10min: (3Hz-200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 30Hz-200µs x 5s 80%) x 40 cycles
2*	No	Firming up lower limbs	Total time 4min frequency 6Hz impulse width 300µs	Total time 15min: (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 20Hz-300µs x 5s 80%) x 60 cycles	Total time 10 min: (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 30Hz-300µs x 5s 80%) x 40 cycles
3*	No	Toning up upper limbs and trunk	Total time 4min frequency 6Hz Impulse width 200µs	Total time 15min: (3Hz-200µs x 7s 80%+ 1Hz 200µs x 3s 100% + 40Hz-200µs x 5s 75%) x 60 cycles	Total time 10min: (3Hz-200µs x 7s 80%+ 1Hz 200µs x 3s 100% + 50Hz-200µs x 5s 75%) x 40 cycles
4*	No	Toning up lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 15min: (3Hz-300µs x 7s 80%+ 1Hz 300µs x 3s 100% + 40Hz-300µs x 5s 75%) x 60	Total time 10min: (3Hz-300µs x 7s 80%+ 1Hz 300µs x 3s 100% + 50Hz-300µs x 5s 75%) x 40 cycles

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
				cycles	
5*	No	Definition upper limbs and trunk	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 10min: (3Hz-200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 60Hz-200µs x 5s 70%) x 40 cycles	Total time 5min: (3Hz-200µs x 7s 80%+ 1Hz 200µs x 3s 100% + 70Hz-200µs x 5s 70%) x 20 cycles
6*	No	Definition lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 10min: (3Hz-300µs x 7s 80%+ 1Hz--300µs x 3s 100% + 60Hz-300µs x 5s 75%) x 40 cycles	Total time 5min: (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 70Hz-300µs x 5s 75%) x 20 cycles
7*	No	Modelling	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 5min Frequency 12Hz Impulse width 250µs (90%)	Total time 5min: (5Hz-250µs x 5s 90%+ 30Hz-250µs x 5s 90%) x 30 cycles
8*	No	Microlifting	Total time 4min Frequency 12Hz Impulse width 100µs	Total time 10min: (5Hz-100µs x 10s 90%+ 20Hz 100µs x 5s 90%) x 40 cycles	
9*	No	Lipolysis abdomen	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 20 min: (5Hz-250µs x 8s CH1/CH2 80% + 40Hz-250µs x 6s CH1 80%+ 40Hz-250µs x 6s CH2 80%) x 60 cycles	Total time 5min Frequency 3Hz Impulse width 250µs (80%)

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
10*	No	Lipolysis thighs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 20min: (5Hz-300µs x 8s CH1/CH2 80% + 40Hz-300µs x 6s CH1 80%+ 40Hz-300µs x 6s CH2 80%) x 60 cycles	Total time 5min Frequency 3Hz Impulse width 300µs (80%)
11*	No	Lipolysis glutei and hips	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 20min: (5Hz-250µs x 8s CH1/CH2 80% + 40Hz-250µs x 6s CH1 80%+ 40Hz-250µs x 6s CH2 80%) x 60 cycles	Total time 5min Frequency 3Hz Impulse width 250µs (80%)
12*	No	Lipolysis arms	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 20min: (5Hz-200µs x 8s CH1/CH2 80% + 40Hz-200µs x 6s CH1 80%+ 40Hz-200µs x 6s CH2 80%) x 60 cycles	Total time 5min Frequency 3Hz Impulse width 200µs (80%)
13*	No	Tissue elasticity	Total time 4min Frequency 10Hz Impulse width 100µs	Total time 10min: (5Hz-100µs x 5s 100% + 15Hz-100µs x 5s 95%+ 3Hz-100µs x 5s 100%) x 40 cycles	Total time 5min Frequency 12Hz Impulse width 100µs (95%)
14	No	Capillari-zation	Total time 30min: (1' 3Hz-		

Prg	Medical prg. Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			300µs 100% + 1' 5Hz-250µs 100%+ 1' 8Hz-200µs 100%) x 10 cycles		
15*	No	Heaviness in legs	Total time 10min: (70Hz-70µs x 5s 100% + 3Hz 200µs x 5s 100%) x 60 cycles	Total time 5min Frequency 3Hz Impulse width 300µs	Total time 10min Frequency 1Hz Impulse width 300µs

*When the program shifts to the following phase, the device emits an acoustic signal indicating the user to increase the intensity of the channel and at the same time the icon starts blinking near the intensity indicator.

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

BEAUTY1 • Firming up upper limbs and trunk (non-medical program)
BEAUTY2 • Firming up lower limbs (non-medical program)
These programs are indicated for firming up muscles of the arms and bust (BEAUTY1), or the legs (BEAUTY2), working mainly on slow twitch fibres. It is recommended to those who have never done any physical activity or have been inactive for a long period of time. Method of use:

1. identify the muscle to be treated. To obtain good results it is best to treat just a few muscles at a time and complete the process described below;
2. position the electrodes as shown in the photos (see reference below);
3. increase the intensity until the impulse can be felt (use a low intensity for the first session to help you to understand how the device works);
4. during the program and over the next few days, the intensity should be gradually increased so that muscle contractions are not painful;

5. during contraction generated by the unit, contract the muscle voluntarily.

A cycle of 15/20 applications must be completed before the first results can be seen; it is recommended one application for each muscle every two days with a day of rest in between. It is possible to work on pairs of muscles, for example thighs and abdominal muscles, treating one set one day and the other the next day. Working on too many muscles at the same time is not recommended. **A little, but constantly!**

Session duration: 29 minutes.

Electrodes' positioning: photos from 01 to 23, according to the interested muscles, of the *Positions manual*.

Intensity: it depends on the sensibility of the patient, it is recommended starting at low intensity levels and then gradually increase the intensity, never reaching or exceeding the pain threshold.

BEAUTY3 • Toning up upper limbs and trunk (non-medical program)
BEAUTY4 • Toning up lower limbs (non-medical program)

These programs are indicated for toning up muscles in the arms and bust (BEAUTY3), or the legs (BEAUTY4), working mainly on fast twitch fibres. It is recommended to those who already practice moderate physical activity. Method of use:

1. identify the muscle to be treated. To obtain good results it is best to treat just a few muscles at a time and complete the process described below;
2. position the electrodes as shown in the photos (see reference below);
3. increase the intensity until the impulse can be felt (use a low intensity for the first session to help you to understand how the device works);
4. during the program and over the next few days, the intensity should be gradually increased so that muscle contractions are not painful;
5. during contraction generated by the unit, contract the muscle voluntarily.

A cycle of 15/20 applications must be completed before the first results can be seen; it is recommended one application for each muscle every two days with a day of rest in between. It is possible to work on pairs of muscles, for example thighs and abdominal muscles, treating one set one day and the other the next day. Working on too many muscles at the same time is not recommended. **A little, but constantly!**

Session duration: 29 minutes.

Electrodes' positioning: photos from 01 to 23, according to the interested muscles, of the *Positions manual*.

Intensity: it depends on the sensibility of the patient, it is recommended starting at low intensity levels and then gradually increase the intensity, never reaching or exceeding the pain threshold.

BEAUTY5 • Definition upper limbs and trunk (non-medical program)
BEAUTY6 • Definition lower limbs (non-medical program)
These programs are Indicated for defining muscles in the arms and bust (BEAUTY5), or the legs (BEAUTY6), working on explosive fibres. It is recommended to those who already practice good physical activity and wish to define their muscles in greater detail. Method of use:

1. identify the muscle to be treated. To obtain good results it is best to treat just a few muscles at a time and complete the process described below;
2. position the electrodes as shown in the photos (see reference below);
3. increase the intensity until the impulse can be felt (use a low intensity for the first session to help you to understand how the device works);
4. during the program and over the next few days, the intensity should be gradually increased so that muscle contractions are not painful;
5. during contraction generated by the unit, contract the muscle voluntarily.

A cycle of 15/20 applications must be completed before the first results can be seen; it is recommended one application for each muscle every two days with a day of rest in between. It is possible to work on pairs of muscles, for example thighs and abdominal muscles, treating one set one day and the other the next day. Working on too many muscles at the same time is not recommended.
Session duration: 19 minutes.
Electrodes' positioning: photos from 01 to 23, according to the interested muscles, of the *Positions manual*.
Intensity: it depends on the sensibility of the patient, it is recommended starting at low intensity levels and then gradually increase the intensity, never reaching or exceeding the pain threshold.

BEAUTY7 • Modelling (non-medical program)
Due to a combination of capillarizing and toning impulses, this program helps mobilise fat in areas where it tends to accumulate. It is recommended a daily application.
Session duration: 14 minutes per phase.
Electrodes' positioning: photos from 01 to 20 and photos 22 and 23 of the *Positions manual*.
Intensity: medium.

BEAUTY8 • Microlifting (non-medical program)

The following program is used to tone facial muscles using a special impulse to improve both the appearance and the dynamism of facial muscles.

Session duration: 14 minutes.

Electrodes' positioning: photos 24 of the *Positions manual*. N.B. A minimum distance of 3 cm must be kept between the electrode and the eyeball.

IMPORTANT: take care when adjusting the intensity as facial muscles are particularly sensitive; intensity should be increased gradually, starting with a very low level of stimulation (just above perception) and increasing with care until you reach a good level of stimulation, represented by good muscle activation.

IMPORTANT: it is not necessary to reach levels of intensity capable of causing discomfort! The equation "more pain = more gain" is completely misleading and counterproductive.

Great and significant results are obtained through consistency and patience.

BEAUTY9/10/11/12 • Lipolysis abdomen (9), thighs (10), glutei and hips (11), arms (12) (non-medical program)

These specific drainage programs increase microcirculation within and around the muscle fibres treated and create rhythmic contractions, facilitating the discharge of allogenic substances and promoting lymphatic activity. It can also be applied to older people to improve blood and lymphatic circulation. The program produces sequential tonic contractions, reproducing the typical effect of electronic lymphatic drainage.

There are no real limits of application for these programs, which can be practiced until the desired result has been achieved. The first results can usually be seen after 3/4 weeks practicing 4/5 sessions a week.

Session duration: 29 minutes.

Electrodes' positioning:

- BEAUTY9: photo 20 of the *Positions manual*.
- BEAUTY10: photo 21 of the *Positions manual*.
- BEAUTY11: glutei photo 19 and hips photo 23 (CH1 on one hip and CH2 on the other) of the *Positions manual*.
- BEAUTY12: arms photo 15 and 16 (CH1 on one arm and CH2 on the other) of the *Positions manual*.

Intensity: enough to produce good muscle contractions during the treatment but not enough to cause any soreness.

BEAUTY13 • Tissue elasticity (non-medical program)

It is a two-phase program, that stimulates the superficial muscle fibres. The frequencies used facilitate the removal of substances accumulated on the surface and improve the dynamic appearance of the skin.
Session duration: 19 minutes.
Electrodes' positioning: form a square above the area to be treated as shown in *Figure 1* (see previous paragraph).
Intensity: to be adjusted to produce "surface vibrations".

BEAUTY14 • Capillarization (non-medical program)
The capillarization program significantly increases arterial flow in the treated area; this program is very useful for recovering after intense aerobic work (firming up and training) and improves local microcirculation.
Session duration: 30 minutes.
Electrodes' positioning: photos 01 to 20 in the *Positions manual*.
Intensity: medium.

BEAUTY15 • Heaviness in legs (non-medical program)
This program is used to improve blood flow and muscle oxygenation speeding up the elimination of lactic acid (produced after anaerobic sessions for muscle definition), reducing soreness and the risk of contractures. Thanks to this program the muscle treated will be ready for a new training session or competition much more quickly.
Session duration: 25 minutes.
Electrodes' positioning: photos 01 to 20 in the *Positions manual*.
Intensity: starting from medium-low, enough to produce good movement of the treated part; increase intensity progressively until the treated muscle is subjected to a strong massage.

Treatment programs for muscles firming up and lipolysis

Muscle	Electrodes' positioning reference	Weekly training program				No. of weeks
		Day 1	Day 3	Day 5	Day 7	
Abdominal muscles - firming up	Photo 1/20	BEAUTY14	BEAUTY1	BEAUTY14+ BEAUTY1	BEAUTY1	6
Abdominal muscles – post partum	Photo 20	BEAUTY14	BEAUTY1	BEAUTY14	BEAUTY1	8
Pectoral muscles - firming up	Photo 7/17	BEAUTY14	BEAUTY1	BEAUTY1	BEAUTY1	6

Muscle	Electrodes' positioning reference	Weekly training program				No. of weeks
		Day 1	Day 3	Day 5	Day 7	
Thighs - firming up	Photo 11/18	BEAUTY14	BEAUTY2	BEAUTY14+ BEAUTY2	BEAUTY2	5
Glutei - firming up	Photo 19	BEAUTY14	BEAUTY2	BEAUTY14+ BEAUTY2	BEAUTY2	5
Arms biceps - firming up	Photo 2/15	BEAUTY14	BEAUTY1	BEAUTY14+ BEAUTY1	BEAUTY1	5
Arms triceps - firming up	Photo 3/16	BEAUTY14	BEAUTY1	BEAUTY14+ BEAUTY1	BEAUTY1	5
Lipolysis - abdomen	Photo 20	BEAUTY9	BEAUTY14	BEAUTY9	BEAUTY1	6
Lipolysis - thighs	Photo 21	BEAUTY10	BEAUTY14	BEAUTY10	BEAUTY2	6
Lipolysis - glutei	Photo 19	BEAUTY11	BEAUTY14	BEAUTY11	BEAUTY2	6
Lipolysis - hips	Photo 23 (CH1 on right hip, CH2 on the left hip)	BEAUTY11	BEAUTY14	BEAUTY11	BEAUTY2	6
Lipolysis - arms	Photo 15+16 (4 electrodes of CH1 on the right arm and 4 of CH2 on the left arm)	BEAUTY12	BEAUTY14	BEAUTY12	BEAUTY1	6

The reference photo for the electrodes' positioning are available in the *Positions manual*.

WARNING: use moderate intensity in the first two weeks and in the following weeks constantly increasing.

FITNESS programs

Prg	Medical prg Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
1*	No	Warming up	Total time	Total time 3min	Total time

Prg	Medical prg Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			3min Frequency 6Hz Impulse width 250µs	Frequency 8Hz Impulse width 250µs	10min (5Hz-250µs x 7s 80%+ 1Hz-250µs x 3s 100% + 30Hz-250µs x 5s 80%) x 40 cycles
2*	No	Resistance upper limbs and trunks	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 15min (3Hz-200µs x 9s 80%+ 1Hz-200µs x 3s 100% + 20Hz-200µs x 8s 80%) x 45 cycles	Total time 15min (3Hz-200µs x 9s 80%+ 1Hz-200µs x 3s 100% + 30Hz-200µs x 8s 80%) x 45 cycles
3*	No	Resistance lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 15 min (3Hz-300µs x 9c 80%+ 1Hz-300µs x 3s 100% + 20Hz-300µs x 8s 80%) x 45 cycles	Total time 15min (3Hz-300µs x 9s 80%+ 1Hz-300µs x 3s 100% + 20Hz-300µs x 8s 80%) x 45 cycles
4*	No	Resistant strength upper limbs and trunk	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 15 min (3Hz-200µs x 9s 80%+ 1Hz-200µs x 3s 100% + 40Hz-200µs x 8s 80%) x 45 cycles	Total time 10min (3Hz-200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 50Hz-200µs x 5s 75%) x 40 cycles
5*	No	Resistant strength lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 15min (3Hz-300µs x 9s 80%+ 1Hz-300µs x 3s 100% + 20Hz-300µs x 8s 80%) x 45 cycles	Total time 10min (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 50Hz-300µs x 5s 75%) x 40 cycles
6*	No	Basic strength upper limbs	Total time 4min	Total time 10min (3Hz-200µs x 7s	Total time 10min (3Hz-

Prg	Medical prg Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
		and trunk	Frequency 6Hz Impulse width 200µs	80%+ 1Hz-200µs x 3s 100% + 50Hz-200µs x 5s 75%) x 40 cycles	200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 60Hz-200µs x 5s 75%) x 40 cycles
7*	No	Basic strength lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 10min (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 50Hz-300µs x 5s 75%) x 40 cycles	Total time 10min (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 60Hz-300µs x 5s 75%) x 40 cycles
8*	No	Fast strength upper limbs and trunk	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 10min (3Hz-200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 70Hz-200µs x 5s 80%) x 40 cycles	Total time 10min (3Hz-200µs x 7s 80%+ 1Hz-200µs x 3s 100% + 80Hz-200µs x 5s 80%) x 40 cycles
9*	No	Fast strength lower limbs	Total time 4min Frequency 6Hz Impulse width 300µs	Total time 10min (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 70Hz-300µs x 5s 80%) x 40 cycles	Total time 10min (3Hz-300µs x 7s 80%+ 1Hz-300µs x 3s 100% + 80Hz-300µs x 5s 80%) x 40 cycles
10*	No	Explosive strength upper limbs and trunk	Total time 4min Frequency 6Hz Impulse width 200µs	Total time 10min (3Hz-200µs x 12s 90%+ 1Hz-200µs x 3s 100% + 100Hz-200µs x 5s 80%) x 30 cycles	Total time 10min (3Hz-200µs x 12s 90%+ 1Hz-200µs x 3s 100% + 120Hz-200µs x 5s 80%) x 30 cycles
11*	No	Explosive strength lower	Total time 4min Frequency	Total time 10min (3Hz-300µs x 12s 90%+ 1Hz-300µs	Total time 10min (3Hz-300µs x 12s

Prg	Medical prg Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
			6Hz Impulse width 300µs	x 3s 100% + 100Hz-300µs x 5s 80%) x 30 cycles	90%+ 1Hz-300µs x 3s 100% + 120Hz-300µs x 5s 80%) x 30 cycles
12	No	Deep capillarization	Total time 30min (20 s 5Hz-200µs 100% + 20s 8Hz-150µs 100% + 20s 12Hz-100µs 100%) x 30 cycles		
13*	No	Muscle recovery	Total time 10min Frequency 6Hz Impulse width 250µs	Total time 5min (5Hz-250µs x 7s 80%+ 1Hz 250µs x 3s 100% + 20Hz-250µs x 5s 80%) x 20 cycles	Total time 10min Frequency 2Hz Impulse width 250µs
14*	No	Agonist/ Antagonist	Total time 4min Frequency 6Hz Impulse width 250µs	Total time 15min (5Hz-250µs x 8s CH1&CH2 80%+ 50Hz 250µs x 6s 75% CH1 + 50Hz 250µs x 6s 75% CH2) x 45 cycles	Total time 5min Frequency 10Hz Impulse width 250µs (80%)
15*	No	Sequential tonic contractions upper limbs and trunk	Total time 3min Frequency 6Hz Impulse width 200µs	Total time 10min (30Hz-200µs x 5s 80% CH1 + 30Hz-200µs x 5s 80% CH2) x 60 cycles	Total time 5min frequency 4Hz impulse width 200µs (90%)
16*	No	Sequential tonic contractions lower limbs	Total time 3min Frequency 6Hz Impulse width 300µs	Total time 10min (30Hz-300µs x 5s 80% CH1 + 30Hz-300µs x 5s 80% CH2) x 60 cycles	Total time 5min Frequency 4Hz Impulse width 300µs (90%)
17*	No	Sequential phasic contractions	Total time 3min Frequency	Total time 10min (50Hz-200µs x 5s	Total time 5min Frequency 4Hz Impulse width

Prg	Medical prg Yes/No	Description	PHASE 1	PHASE 2	PHASE 3
		upper limbs and trunk	6Hz Impulse width 200µs	75% CH1 + 50Hz-200µs x 5s 75% CH2) x 60 cycles	200µs (90%)
18*	No	Sequential phasic contractions lower limbs	Total time 3min Frequency 6Hz Impulse width 300µs	Total time 10min (50Hz-300µs x 5s 75% CH1 + 50Hz-300µs x 5s 75% CH2) x 60 cycles	Total time 5min Frequency 4Hz Impulse width 300µs (90%)
19*	No	Muscle relaxant	Total time 10min (3Hz-250µs x 7s 80%+ 1Hz-250µs x 3s 100% + 20Hz 250µs x 5s 80%) x 40 cycles	Total time 10min Frequency 6Hz Impulse width 250µs (90%)	Total time 10min Frequency 2Hz Impulse width 250µs
20*	No	Deep massage	Total time 5min Frequency 3Hz Impulse width 250µs	Total time 10min (3Hz-250µs x 2s CH1 100% + 3Hz-250µs x 2s CH2 100%) x 150 cycles	Total time 10min (2Hz-250µs x 2s CH1 100% + 2Hz-250µs x 2s CH2 100%) x 150 cycles

*When the program shifts to the following phase, the device emits an acoustic signal indicating the user to increase the intensity of the channel and at the same time the icon starts blinking near the intensity indicator.

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

IMPORTANT! Stimulation intensity during the contraction: the muscle must contract well without causing pain. It is recommended to voluntarily contract the muscle during the contractions induced by the electronic stimulator to reduce the sense of discomfort and improve the proprioceptive response: in this way, after electrostimulation, the stimulated muscle will be capable of contracting all of the muscle fibers and the parameters of strength and resistance will improve.
Contraction should increase as you pass through the following programs:

- Resistance

- Resistant strength
- Basic strength
- Fast strength
- Explosive strength

FITNESS1 • Warming up (non-medical program)
Program suitable for use before training sessions or competitions, very useful for sports involving maximum effort right from the start.
Session duration: 16 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: medium; the muscle must work without strain.

FITNESS2 • Resistance upper limbs and trunks (non-medical program)
FITNESS3 • Resistance lower limbs (non-medical program)
The Resistance program is used in sports to increase muscle resistance, acting mainly on slow-twitch fibres; in fact, this program is indicated for endurance sports: marathon runners, cross-country skiers, ironman, etc. In the event of muscle ache after stimulation, use the FITNESS19 program (Muscle relaxant).
Session duration: 34 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: if not particularly fit, start with a low intensity then increase gradually. For trained athletes the intensity used should be enough to produce visible muscle contractions.

FITNESS4 • Resistant strength upper limbs and trunks (non-medical program)
FITNESS5 • Resistant strength lower limbs (non-medical program)
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. It is indicated for sporting disciplines involving long, intense periods of exertion. In the event of muscle ache after stimulation, use the FITNESS19 program (Muscle relaxant).
Session duration: 29 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: if not particularly fit, start with a low intensity then increase gradually. For trained athletes the intensity used should be enough to produce visible muscle contractions.

FITNESS6 • Basic strength upper limbs and trunks (non-medical program)

FITNESS7 • Basic strength lower limbs (non-medical program)

This program is used in sport to develop basic strength, which for 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 following basic procedure will enable you to obtain the first results: two sessions per week (for each muscle region) for the first three weeks at medium/low intensity, three sessions per week for the next three weeks at high intensity. In the event of fatigue, suspend training for a few days and use the FITNESS19 program (Muscle relaxant).

Session duration: 24 minutes.

Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.

Intensity: gradually increased session after session without overexerting the muscles.

FITNESS8 • Fast strength upper limbs and trunks (non-medical program)

FITNESS9 • Fast strength lower limbs (non-medical program)

This program is designed to increase speed in fast athletes and develop it in athletes lacking this 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, almost past endurance during the contraction.

Session duration: 24 minutes.

Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.

Intensity: gradually increased session after session without overexerting the muscles until reaching the maximum level of tolerance.

FITNESS10 • Explosive strength upper limbs and trunks (non-medical program)

FITNESS11 • Explosive strength lower limbs (non-medical program)

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.
Session duration: 24 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: during contraction, the intensity has to be the highest that can be endured in order to obtain maximum muscle exertion whilst involving the greatest number of fibres.

FITNESS12 • Deep capillarization (non-medical program)
This program significantly increases arterial flow in the treated area. Prolonged use of this program develops the intramuscular capillary network of fast-twitch fibers. The effect obtained is an increase in the capacity of fast-twitch fibers to withstand strain over extended periods of time. For an athlete with good resistance, the capillarization 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.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: medium.

FITNESS13 • Muscle recovery (non-medical program)
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. This program helps drainage and winding down, improving muscle oxygenation and helping to discharge synthetic substances produced during exertion.
Session duration: 25 minutes.
Electrodes' positioning: photo from 01 to 20 of the *Positions manual,* according to the area to be treated.
Intensity: medium-low, increasing during the last 5/10 minutes.

FITNESS14 • Agonist/Antagonist (non-medical program)
The electronic stimulator produces contractions alternated between 2 channels: during the first 4 minutes of warm-up the 2 channels work simultaneously, during the central work phase (15 minutes) muscle contractions are alternated between Channel 1 (agonist muscles) and Channel 2 (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. With this program, muscle relaxation is obtained by simultaneous

stimulation from both channels during the last 5 minutes. In the event of fatigue, suspend the training for a few days and use the FITNESS19 program (Muscle relaxant).
Session duration: 24 minutes.
Electrodes' positioning: photo from 02 to 05 and 11-12 of the *Positions manual.*
Intensity: during contraction has to be adjusted so that the contraction intensity is the same as a voluntary one, in order to reduce the sense of discomfort and reach higher intensities. Intensity must be increased gradually treatment by treatment, without overstraining the muscles.

FITNESS15 • Sequential tonic contractions upper limbs and trunks (non-medical program)
FITNESS16 • Sequential tonic contractions lower limbs (non-medical program)
This program increases microcirculation within and around the muscle fibers treated creating rhythmic contractions, fostering 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 right thigh). These programs can be carried out using self-adhesive electrodes.
Session duration: 18 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual*.
Intensity: enough to produce good muscle contractions during the treatment, but not enough to cause any soreness. It mainly works on slow-twitch fibers.

FITNESS17 • Sequential phasic contractions upper limbs and trunks (non-medical program)
FITNESS18 • Sequential phasic contractions lower limbs (non-medical program)
This program produces rhythmic contractions with a stimulation frequency typical of fast-twitch fibers. Thanks to this stimulation frequency, it is suitable for increasing sequentially muscle strength. The programs produce sequential phasic contractions on both channels. Unlike the previous program, this one uses a higher stimulation frequency during the contraction phase and therefore works mainly on fast-twitch fibers.
Session duration: 18 minutes.
Electrodes' positioning: photo from 01 to 23 (21 excluded) of the *Positions manual.*
Intensity: enough to produce good muscle contractions during the treatment, but not enough to cause any soreness.

FITNESS19 • Muscle relaxant (non-medical program)

Can be used for all sports, after competitions or after the most demanding training sessions, in particular after long and intense exertion - to be used immediately after exertion. This program helps drainage and capillarization, improving muscle oxygenation and helping to discharge synthetic substances produced during exertion.
Session duration: 30 minutes.
Electrodes' positioning: photo from 01 to 20 in the *Positions manual*.
Intensity: medium-low, increased during the last 10 minutes of the session.

FITNESS20 • Deep massage (non-medical program)
This program 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. It is similar to the previous one: however, it uses lower frequencies with a greater capacity for vascularization. It helps drainage and capillarization, improving muscle oxygenation and helping to discharge synthetic substances produced during exertion.
Session duration: 25 minutes.
Electrodes' positioning: photos from 01 to 20 in the *Positions manual*.
Intensity: medium-low, increased during the last 10 minutes of the session.

Treatment programs for muscle strength

Muscle	Electrodes' positioning reference	Weekly training program				No. of weeks
		Day 1	Day 3	Day 5	Day 7	
Abdominal muscles - basic strength	Photo 1/20	FITNESS6	FITNESS19+ FITNESS6	FITNESS6	FITNESS12	5
Pectoral muscles - basic strength	Photo 7/17	FITNESS6	FITNESS19+ FITNESS6	FITNESS6	FITNESS12	5
Quadriceps – basic strength	Photo 11/18	FITNESS7	FITNESS19+ FITNESS7	FITNESS7	FITNESS12	5
Glutei – basic strength	Photo 19	FITNESS7	FITNESS19+ FITNESS7	FITNESS7	FITNESS12	5
Arms biceps – basic strength	Photo 2/15	FITNESS6	FITNESS19+ FITNESS6	FITNESS6	FITNESS12	6
Arms	Photo 3/16	FITNESS6	FITNESS19	FITNESS6	FITNESS12	6

Muscle	Electrodes' positioning reference	Weekly training program				No. of weeks
		Day 1	Day 3	Day 5	Day 7	
triceps – basic strength			+FITNESS6			

The reference photo for the electrodes' positioning are available in the *Positions manual*.

WARNING: use moderate intensity in the first two weeks and in the following weeks constantly increasing.

Self-adhesive electrodes

The position of the electrodes is shown in the *manual of electrode positions*.
The electrodes supplied are top quality, pre-gelled and ready for use, particularly suitable for electrostimulation treatments.
Their high flexibility makes it easy to treat all areas. Before using, remove the protective plastic from the electrode, position it on the skin as shown in the manual and replace it in the plastic after use.
The electrode duration is determined by the skin's pH value; we recommend no more than 10/15 applications using the same electrode.
Repeated use of the same electrodes can compromise stimulation safety, which is why electrodes must not be used when they no longer stick to the skin; in fact, it can cause skin redness that can last for many hours after stimulation. In this case, consult a doctor.
For a safe use please refer to indications and warnings on electrodes package and in *Warning* paragraph.

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 IACER Srl carries out a functional test every 24 months. The manufacturer does not consider the MIO-CARE device repairable by any not authorized personnel. Each operation of the kind perpetuated by personnel not authorized by the manufacturer will be considered as tampering the device, freeing the manufacturer and IACER Srl 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.
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.

TRANSPORTATION AND STORAGE

Precaution for the transportation

There is no particular precaution to be taken during transportation of the device, since MIO-CARE is a portable device. In any case it is recommended to store MIO-CARE and its accessories in the supplied carrying bag after each treatment. Protect the device from high temperature, direct daylight and liquids.

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 MIO-CARE at the end of each treatment and to remove the cables from the connectors. MIO-CARE should be kept in the supplied carrying bag, together with the rest of the equipment supplied and carefully stored on a secure surface. The performances of the equipment are granted if it is stored according to the following conditions:
Outside the carrying bag:

temperature:	from +5°C to +40°C
maximum relative humidity:	from 30% to 75%

atmospheric pressure: from 700 to 1060hPa

Inside the supplied carrying bag:

temperature: from -10°C to +55°C
maximum relative humidity: from 10% to 90%
atmospheric pressure: from 700 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

Any type of work on MIO-CARE must be carried out exclusively by IACER Srl. In any event, any presumed malfunction of MIO-CARE must be verified before sending the device to IACER Srl.

Here below are some typical situations:

- **MIO-CARE cannot be turned on**:
  - recharge the batteries and try to switch it on again; if it still does not switch on, check that the power supply socket is working.
  - Check that the ON/OFF button has been pressed correctly (held down for at least one second).
- **MIO-CARE does not transmit electric impulses or transmit low intensity**:
  - check that the cable jacks have been inserted in the electrodes and that the plastic protection has been removed from the electrode.
  - Check that the cables have been connected correctly (connector well inserted in the device).
  - Check that the electrodes have been connected correctly, are in good conditions and correctly positioned according to user manual instructions.
- **MIO-CARE switches off during operation:**
  - recharge the batteries and start the treatment again. If the problem persists, contact IACER Srl.
- **Stimulation is not comfortable:**
  - check that intensity is not too high and decrease intensity if needed.
  - Check the electrodes position: follow user manual and electrodes *Position manual* instructions to avoid that electrodes are too close.
  - Check the sized electrodes section (suggested by the manufacturer): electrodes too small can cause uncomfortable stimulations.
- **Intermittent output:**

- check that electrodes and cables have been connected correctly. If the problem persists, replace cable or contact IACER Srl.

– **Stimulation is ineffective**:
  - check that electrodes have been positioned correctly. If the problem persists, contact the doctor/therapist.

– **Treatment zone becomes red and/or you feel a persistent pain:**
  - the problem may be caused by the repeated treatment on the same area: re-position the electrodes and if the problem persists interrupt the treatment and contact the doctor/therapist.
  - Check that electrodes are stuck to the skin well and check that they are not dirty and/or consumed. Change the electrodes and continue the treatment. If the problem persists, contact the doctor/therapist.

Battery charging

MIO-CARE is supplied by internal rechargeable Ni-MH 800mAh battery with new long-lasting technology.
When during the treatment many intensity increases is needed or the device turns off, it indicates a low battery state. **In this case, the display shows**  **on the middle lower side: the icon is showed only when the battery is discharged or when the charger is disconnected from the device plug (in this case the display shows all icons for a few seconds). Please pay attention that the DISPLAY DOESN'T SHOW ANY BATTERY ICON FULLY CHARGED.**
To proceed with the charging follow the steps below:

- make sure that the device is switched off before charging with the **ON/OFF** button;
- make sure that the device is not being used by patient (disconnect cables and electrodes);
- connect the battery charger to the plug on the upper side of MIO-CARE and connect the battery charger into the power socket.

After 6/8 hours the recharging will end automatically, so therefore it will be possible to disconnect the charger from the power socket and from the device.

WARNING: 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.

Do not immerge the battery in water or other liquids and do not expose it to heat sources.
Do not dispose of dead or defective batteries with domestic waste; dispose of in an authorized waste collection bin or in any case according to the underlying norm (WEEE).

Only adults should be managing the battery. Keep out of children's reach.
We suggest to fully discharge batteries before the new charging to guarantee a longer batteries duration.

WARNING: do not leave the battery completely discharged for long periods. We suggest recharging MIO-CARE once a month for 6/8 hours. We suggest to fully discharge batteries as much as possible before recharging to guarantee a longer batteries duration.

WARNING: after the first recharge, the battery could present a limited capacity. This is a normal characteristic of Ni-MH battery. We suggest recharging the battery after each treatment for 3 or 4 times.

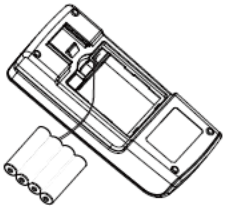
Do not use the battery charger if:

- 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.

Battery substitution

Open the battery compartment on the back side of the device, connect the battery wire to the plug inside the battery compartment (see the image on the left).
Insert the battery and close the battery compartment.

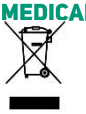


Warning: remove the battery in case of prolonged inactivity (over two months).

Batteries have to be handled by adult persons: keep them out of children's reach.

Disposal

The electro stimulator MIO-CARE 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 MIO-CARE device, unless information contained in this manual regarding installation, use and maintenance is strictly adhered. The wearing parts (batteries and electrodes) 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 IACER Srl.
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 IACER Srl.

Warranty conditions

1) Should assistance be needed, enclose the purchasing receipt when sending the device to IACER Srl.
2) The warranty period is valid only on the electronic parts. The warranty will be granted by the shop or directly by IACER Srl.
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 (the device works at 4.8V with the internal batteries).
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

IACER Srl 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 Martellago (VE)
Tel. 041.5401356 • Fax 041.5402684

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

Spare part

IACER Srl 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 IACER Srl (see also paragraph *Warnings*).

Electromagnetic interferences and electromagnetic compatibility tables

The MIO-CARE equipment 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.

The equipment does not generate significant radio frequency energy and is adequately immune to radiated electromagnetic fields. Therefore, it does not detrimentally 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 general, the use of accessories other than those specified or provided by the manufacturer could result in increased electromagnetic emissions or decreased electromagnetic immunity of the MIO-CARE and result in improper functioning.

In any case, in order to avoid any interference problems, it is recommended to use the therapy equipment enough far away from critical equipment for monitoring vital patient functions, and to be careful when applying therapy to patients with pacemakers. 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, in particular portable RF communications equipment (including peripherals such as antenna cables and external antennas) should not be used closer than 30cm (12 inches) to any part of the device, including the cables specified by the manufacturer; otherwise, it could lead to degradation of the performance of the MIO-CARE.

In conclusion, the use of MIO-CARE adjacent to or stacked with other equipment should be avoided, since it could cause improper functioning. If such use is necessary, the MIO-CARE and the other equipment should be constantly observed to verify that they are operating normally.

When MIO-CARE is used in an environment relatively dry, strong electromagnetic interferences usually occur. At this time, the device may be affected as follows:

- the device stops supplying;
- the device turns off;
- the device restarts.

The above phenomena do not affect the basic safety and essential performance of the device, which can be normally used according to the instructions given in this manual. If you want to avoid the above phenomena, please use the device according to the environment's conditions specified in the manual.

For more details, please see the EMC tables at the end of this manual.

TABELLE COMPATIBILITÀ ELETTROMAGNETICA – ELECTROMAGNETIC COMPATIBILITY TABLES

Guida e dichiarazione del costruttore – EMISSIONI ELETTROMAGNETICHE – PER TUTTI GLI APPARECCHI ED I SISTEMI ***Guidance and manufacturer's declaration – ELECTROMAGNETIC EMISSIONS – FOR ALL EQUIPMENT AND SYSTEMS***		
Il dispositivo è previsto per funzionare nell'ambiente elettromagnetico sotto specificato. Il cliente o l'utilizzatore del dispositivo deve garantire che esso venga usato in tale ambiente. *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.*		
Prova di emissione ***Emissions Test***	**Conformità** ***Compliance***	**Ambiente elettromagnetico - Guida** ***Electromagnetic environment - guidance***
Emissioni RF *RF emissions* CISPR 11	Gruppo 1 *Group 1*	Il dispoisitivo utilizza energia RF solo per il suo funzionamento interno. Perciò le sue emissioni RF sono molto basse e verosimilmente non causano nessuna interferenza negli apparecchi elettronici vicini *The device 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.*
Emissioni RF *RF emissions* CISPR 11	Classe B *Class B*	Il dispositivo è adatto per l'uso in tutti i locali compresi quelli domestici e quelli collegati direttamente ad un'alimentazione di rete pubblica a bassa tensione che alimenta edifici usati per scopi domestici. *The device is suitable for domestic establishment and in establishment directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.*
Emissioni armoniche *Harmonics emissions* EN 61000-3-2	Classe A *Class A*	
Emissioni di fluttuazioni di tensione/flicker *Voltage fluctuation/flicker emissions* EN 61000-3-3	Conforme *Compliant*	

Guida e dichiarazione del costruttore – IMMUNITÀ ELETTROMAGNETICA – PER TUTTI GLI APPARECCHI ED I SISTEMI ***Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR ALL EQUIPMENT AND SYSTEMS***			
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Prova di immunità ***Immunity test***	**Livello di prova** ***Test level*** **EN 60601-1-2**	**Livello di conformità** ***Compliance level***	**Ambiente elettromagnetico - Guida** ***Electromagnetic environment - guide***
Scarica elettrostatica (ESD) *Electrostatic discharge (ESD)* EN 61000-4-2	± 8kV a contatto *in contact*	± 8kV a contatto *in contact*	I pavimenti devono essere in legno, calcestruzzo o in ceramica. Se i pavimenti sono ricoperti di materiale sintetico, l'umidità relativa dovrebbe essere almeno 30%. *Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.*
	±2kV, ±4kV, ±8kV, ±15kV in aria *on air*	±2kV, ±4kV, ±8kV, ±15kV in aria *on air*	
Transitori/treni elettrici veloci *Electrical fast transient/burst* EN 61000-4-4	±2kV per le linee di alimentazione *for power supplies lines*	±2kV per le linee di alimentazione *for power supplies lines*	La qualità della tensione di rete dovrebbe essere quella di un tipico ambiente commerciale o ospedaliero. *Mains power quality should be that of a typical commercial or hospital environment.*
	±1kV in modo differenziale *differential*	±1kV in modo differenziale *differential*	
Sovratensioni *Impluses* EN 61000-4-5	±0,5kV, ±1kV linea – linea *Line(s) to line*	±0,5kV, ±1kV linea – linea *Line(s) to line*	La qualità della tensione di rete dovrebbe essere quella di un tipico ambiente commerciale o ospedaliero. *Mains power quality should be that of a typical commercial or hospital environment.*
	±0,5kV, ±1kV, ±2kV linea a terra *Line(s) to earth*	±0,5kV, ±1kV, ±2kV linea a terra *Line(s) to earth*	
Buchi di tensione, brevi interruzioni e variazioni di tensione	0% U_T durante 0.5 cicli, a 0°, 45°, 90°,	0% U_T durante 0.5 cicli, a 0°, 45°, 90°,	La qualità della tensione di rete dovrebbe essere quella di un tipico ambiente commerciale o

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sulle linee di ingresso dell'alimentazione *Voltage dips, short interruptions and voltage variations on power supplì input lines* EN 61000-4-11	135°, 180°, 225°, 270°y 315° *during 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°y 315°*	135°, 180°, 225°, 270°y 315° *during 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°y 315°*	ospedaliero. Se l'utilizzatore del dispositivo richiede un funzionamento continuato anche durante l'interruzione della tensione di rete, si raccomanda di alimentare il dispositivo con un gruppo di continuità o con batterie. *Main power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery.*
	0% U_T durante 1 ciclo in singola fase 0° *during 1 cycle, at singular phase 0°*	0% U_T durante 1 ciclo in singola fase 0° *during 1 cycle, at singular phase 0°*	
	70% U_T durante 25/30 cicli in singola fase 0° *during 25/30 cycles at singular phase 0°*	70% U_T durante 25/30 cicli in singola fase 0° *during 25/30 cycles at singular phase 0°*	
	0% U_T durante 250/300 cicli *during 250/300 cycles*	0% U_T durante 250/300 cicli *during 250/300 cycles*	
Campo magnético a frequenza di rete (50/60 Hz) *Power frequency (50/60 Hz) magnetic field* EN 61000-4-8	30A/m	30A/m	I campi magnetici a frequenza di rete dovrebbero avere livelli caratteristici di una località tipica in ambiente commerciale o ospedaliero. *Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial*

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			or hospital environment
Nota: U_T è la tensione di rete in c.a. prima dell'applicazione del livello di prova. *Note: U_T is the A.C. mains voltage prior to application of the test level.*			

Guida e dichiarazione del costruttore – IMMUNITÀ ELETTROMAGNETICA – PER GLI APPARECCHI ED I SISTEMI CHE NON SONO DI SOSTENTAMENTO DI FUNZIONI VITALI
Guidance and manufacturer's declaration – ELECTROMAGNETIC IMMUNITY – FOR EQUIPMENT AND SYSTEMS THAT ARE NOT LIFE-SUPPORTING

Il dispositivo è previsto per funzionare nell'ambiente elettromagnetico sotto specificato. Il cliente o l'utilizzatore del dispositivo deve garantire che esso venga usato in tale ambiente.
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.

Prova di immunità ***Immunity test***	**Livello di prova** ***Test level*** **EN 60601-1-2**	**Livello di conformità** ***Conformity level***	**Ambiente elettromagnetico – Guida** ***Electromagnetic environment - guide***
Gli apparecchi di comunicazione a RF portatili e mobili non dovrebbero essere usati vicino a nessuna parte del dispositivo, compresi i cavi, eccetto quando sono rispettate le distanze di separazione raccomandate, calcolate dall'equazione applicabile alla frequenza del trasmettitore. *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. This distance is calculated from the equation applicable to the frequency of the transmitter.*			
Distanza di separazione raccomandata – *Recommended separation distance*			
RF condotta *Conducted RF* EN 61000-4-6	$3V_{eff}$ da 150kHz a 80MHz *from 150kHz to 80MHz* $6V_{eff}$ in banda ISM e radiofrequenze amatoriali tra 150kHz e 80MHz *in ISM band and radio bands between 150kHz and 80MHz*	$3V_{eff}$ da 150kHz a 80MHz *from 150kHz to 80MHz* $6V_{eff}$ in banda ISM e radiofrequenze amatoriali tra 150kHz y 80MHz *in ISM band and radio bands between 150kHz and 80MHz*	$d = 1{,}2\sqrt{P}$ $da\ 150kHz\ a\ 80MHz$ $from\ 150kHz\ to\ 80MHz$
RF irradiata *Radiated RF* EN 61000-4-3	10V/m da 80MHz a 2,7GHz *from 80MHz to 2,7GHz*	10V/m da 80MHz a 2,7GHz *from 80MHz to 2,7GHz*	$d = 1{,}2\sqrt{P}$ $da\ 80MHz\ a\ 800MHz$ $from\ 80MHz\ to\ 800MHz$ $d = 2{,}3\sqrt{P}$ $da\ 800MHz\ a\ 2{,}7GHz$ $from\ 800MHz\ to\ 2{,}7GHz$
ove P è la potenza massima nominale d'uscita del trasmettitore in Watt (W) secondo il costruttore del trasmettitore e *d* è la distanza di separazione raccomandata in metri (m).			

Le intensità di campo dei trasmettitori a RF fissi, come determinato da un'indagine elettromagnetica[a] del sito potrebbe essere minore del livello di conformità in ciascun intervallo di frequenza[b]

Si può verificare interferenza in prossimità di apparecchi contrassegnati dal seguente simbolo: 

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 metres (m).
Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b].
Interference may occur in the vicinity of equipment marked with the symbol above.

NOTE

(1) A 80 MHz e 800 MHz; si applica l'intervallo di frequenza più alto / *At 80 MHz and 800 MHz At 80 MHz and 800 MHz, the higher frequency range applies.*

(2) Queste linee guida potrebbero non applicarsi in tutte le situazioni. La propagazione elettromagnetica è influenzata dall'assorbimento e dalla riflessione di strutture, oggetti e persone */ These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.*

a) Le intensità di campo per trasmettitori fissi come le stazioni base per radiotelefoni (cellulari e cordless) e radiomobili terrestri, apparecchi di radioamatori, trasmettitori radio in AM e FM e trasmettitori TV non possono essere previste teoricamente e con precisione. Per valutare un ambiente elettromagnetico causato da trasmettitori RF fissi, si dovrebbe considerare un'indagine elettromagnetica del sito. Se l'intensità di campo misurata nel luogo in cui si usa un MIO-CARE, supera il livello di conformità applicabile di cui sopra, si dovrebbe porre sotto osservazione il funzionamento normale del MIO-CARE. Se si notano prestazioni anormali, possono essere necessarie misure aggiuntive come un diverso orientamento o posizione del MIO-CARE / *Field strengths from fixed RF transmitters, such as base stations for radio (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 MIO-CARE is used exceeds the applicable RF compliance level above, MIO-CARE should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating MIO-CARE.*

b) L'intensità di campo nell'intervallo di frequenza da 150 kHz a 80 MHz dovrebbe essere minore di 3 V/m */ Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.*

Distanze di separazione raccomandate tra apparecchi di radiocomunicazione portatili e mobili per il dispositivo che non sono di sostentamento delle funzioni vitali
Recommended separation distances between portable and mobile RF communications equipment for the device that are not life-supporting

Il dispositivo è previsto per funzionare in un ambiente elettromagnetico in cui sono sotto controllo i disturbi irradiati RF. Il cliente o l'operatore del dispositivo possono contribuire a prevenire interferenze elettromagnetiche assicurando una distanza minima fra gli apparecchi di comunicazione mobili e portatili a RF (trasmettitori) ed il dispositivo come sotto raccomandato, in relazione alla potenza di uscita massima degli apparecchi di radiocomunicazione.

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

Potenza di uscita massima del trasmettitore specificata (W) ***Rated maximum output power of transmitter (W)***	**Distanza di separazione alla frequenza del trasmettitore (m)** ***Separation distance according to the frequency of the transmitter (m)***		
	$d = 1{,}2\sqrt{P}$ $da\ 150kHz\ a$ $80\ MHz$ $from\ 150kHz$ $to\ 800\ MHz$	$d = 1{,}2\sqrt{P}$ $da\ 80MHz\ a$ $800\ MHz$ $from\ 80MHz$ $to\ 800\ MHz$	$d = 2{,}3\sqrt{P}$ $da\ 800MHz\ a$ $2{,}7GHz$ $from\ 800MHz$ $to\ 2{,}7GHz$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

Per i trasmettitori con potenza nominale massima di uscita sopra non riportata, la distanza di separazione raccomandata d in metri (m) può essere calcolata usando l'equazione applicabile alla frequenza del trasmettitore, dove P è la potenza massima nominale d'uscita del trasmettitore in watt (W) secondo il fabbricante del trasmettitore.

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 / *Note*

1) A 80 MHz e 800 MHz, si applica l'intervallo della frequenza più alto / *At 80 MHz and 800 MHz the separation distance for the higher frequency range applies.*
2) Queste linee guida potrebbero non applicarsi in tutte le situazioni. La propagazione elettromagnetica è influenzata dall'assorbimento e dalla riflessione di strutture, oggetti e persone / *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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