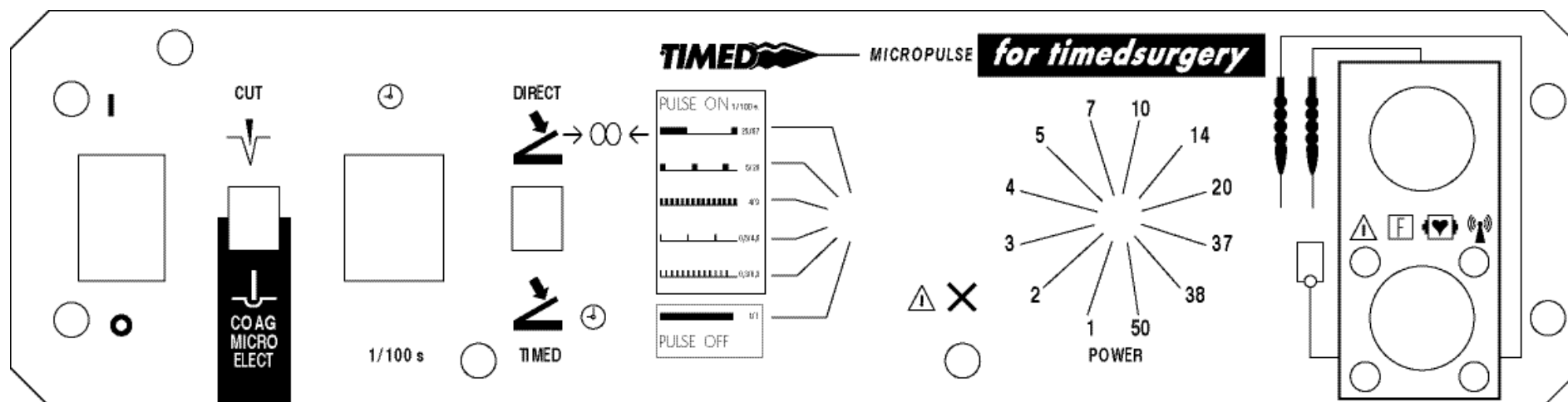


# ***TIMED TD 50A MICROPULSE***



THE FIRST PROGRAMMABLE DIATHERMOCAUTERY



## ***PREFACE***

The first programmable diathermocautery, TIMED extends the application of high-frequency current to operative techniques that were not previously possible. Conceived specifically for Timedsurgery, ***TIMED TD 50A Micropulse*** has been developed under the constant supervision of the plastic surgeon dr. Sergio Capurro, the inventor of this new method of electrosurgery.

For clinical applications, refer to:

- the treatise: ***Programmed Diathermosurgery***: Edizioni D'Arsonval, 1993
- the treatise ***Timedsurgery***, Edizioni D'Arsonval 1998
- the website ***www.timedsurgery.org***



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# 1 DESCRIPTION

## 1.1 **TIMED TD 50A Micropulse: PROGRAMMABLE DIATHERMOCAUTERY**

TIMED TD 50 A Micropulse enables the user to control all the parameters that condition the effect of a diathermic emission on the tissues.

Accurate control of all parameters is fundamental to timed surgery. This new electrosurgical method has undergone years of refinement and testing by a team of doctors and technicians. This research has given rise to several innovative operating techniques. The programmable diathermocaustery enables the experience of one operator to be transferred immediately to others by means of the program data. The use of these data yields results that are always repeatable and of the best quality. Unlike other physical techniques, a programmed diathermic emission always produces the same constant effect since the electrical conductivity of the tissues is virtually the same from one individual to another.

Each diathermic procedure requires the right amount of energy if the desired result is to be achieved; too little will be ineffective, while too much will cause excessive damage to the tissues. The duration of the energy emission is also important; the therapeutic lesions produced by applying a high power for a very short time (e.g. a few hundredths of a second) or a low power for a longer time will be different, even though the total energy is the same. In addition, the wave-form and the dimensions of the electrode also condition the effect of the diathermic emission.

*TIMED TD 50 A Micropulse* has a power system which is expressly designed for use in programmed diathermosurgery. The wave-form of the current has been determined experimentally in order to facilitate proper healing. The 920 KHz frequency ensures that the unanaesthetized patient has no sensation of electric shock and that muscle stimulation is virtually absent. The timing circuit is immune to electromagnetic disturbance.

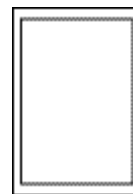
*TIMED TD 50 A Micropulse* is equipped with several safety circuits, including an alarm circuit to monitor the functioning of the patient return electrode, and a circuit which signals any internal faults.

*TIMED TD 50 A Micropulse* has two functions: cutting (CUT) and coagulation with microelectrodes (COAG MICRO ELECT). The programmable system's electromaniples (EM) are color-coded for ease of identification.

## 1.2 INTENDED USE

The *TIMED TD 50 A Micropulse* is specifically designed for use in dermatology, plastic and aesthetic surgery, gynaecology, otorhinolaryngology and aesthetic medicine. For details of the accessories, see section 1.5.

## 1.3 FRONT PANEL



### I/O • ON / OFF SWITCH

This switches on the power to the apparatus. As soon as the power is switched on, Timed 50 A Micropulse runs a 2-second auto-test.



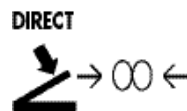
### CUT • CUTTING FUNCTION

Used for sectioning tissues.



### COAG MICRO ELECT • Coagulation function

Adatto per coagulare i tessuti con elettromanipoli a punta acuminata EM10 o a punta smussa EM15, in campo asciutto.

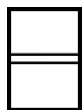


### TIMED 1/100s. • Timing control

This sets the duration of the high-frequency emission from 1 to 99 hundredths of a second when the apparatus is set to the TIMED mode

### DIRECT • Direct function

The duration of the high-frequency emission is controlled directly by means of the pedal.

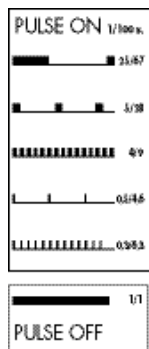


### DIRECT/TIMED SWITCH



### TIMED • Timed function

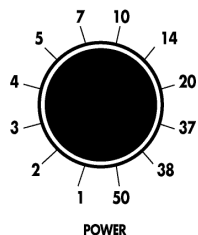
This sets the apparatus for an emission duration timed in hundredths of a second.



### ON/OFF PULSE SWITCH

In the ON position, five types of pulsed emission are available for specific diathermosurgery procedure.

Function in DIRECT or TIMED mode.  
For time see table on page 17.



### POWER OUTPUT CONTROL

This sets the power of the high-frequency output.



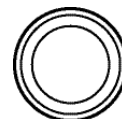
### SETTING FOR TECHNIQUE WITH TWO ELECTROMANIPLES

The apparatus is set when the two indicator lights are on. The procedure is carried out with two electromaniples EM10 Green and Grey, the larger of which acts as the return electrode.



### RETURN ELECTRODE SOCKET

The cable of the patient return electrode (PRE) is plugged into this socket. The socket is also used to connect the second electromaniples EM10 in the treatment of the stellate angiomias.



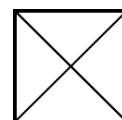
### ACTIVE ELECTRODE OUTLET

The electromaniple cable is plugged into this socket.



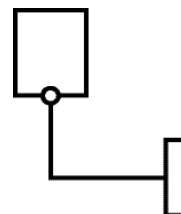
### SET TIME ZERO / NON ZERO

Indicates incompatible programming of the setting TIME 1/100s with the TIMED/DIRECT mode.



### INTERNAL FAULT / POWER CHECK

Alarm given by the safety circuit.



### RETURN ELECTRODE ALARM

Signals faulty connection of the patient return electrode (PRE) either to the patient's skin or to the machine



### APPARATUS EQUIPPED WITH CF DEVICE

To guard against the effects of defibrillation



### CAUTION





Consult enclosed literature



### PATIENT RETURN ELECTRODE

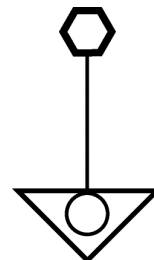
Insulated from earth at high frequencies.

## REAR PANNEL

Korpo s.r.l. Via XX Settembre 3/28 16121 Genoa – Italy		<b>TIMED</b> <b>TD 50A MICROPULSE</b>		TD 50A n. ____/____
V ~ 		H.F. 		
220-240 V		Freq.	920 khz	
50 Hz			49,9W/800Ω	
100 VA		0051		49,9W/800Ω
CLASSE I - PARTE APPLICATA TIPO CF				

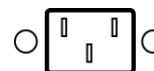
### DATA SHOWN

Model, serial number and main features.



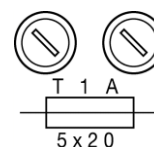
### EQUIPOTENTIAL NODE

This connects the apparatus to the equalisation potential of the operating theatre. It serves to avoid creating different potentials that may generate electric charges and give rise to current dispersion.



### POWER CABLE CONNECTOR

Connects the apparatus to the main power supply.



### FUSE HOLDERS

The supply-circuit fuses can be reached by pressing and turning the holders anticlockwise. The apparatus must first be disconnected from the main supply.



### PNEUMATIC CONTROL PEDAL SOCKET

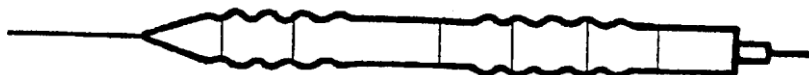
## 1.4 ACCESSORIES REQUIRED FOR SAFE OPERATION

**EM10 ELECTROMANIPLES (TDCE10) (CEW1, CEV1, CEG1, CEY1, CEB1, CEV1I, CEG1I)**



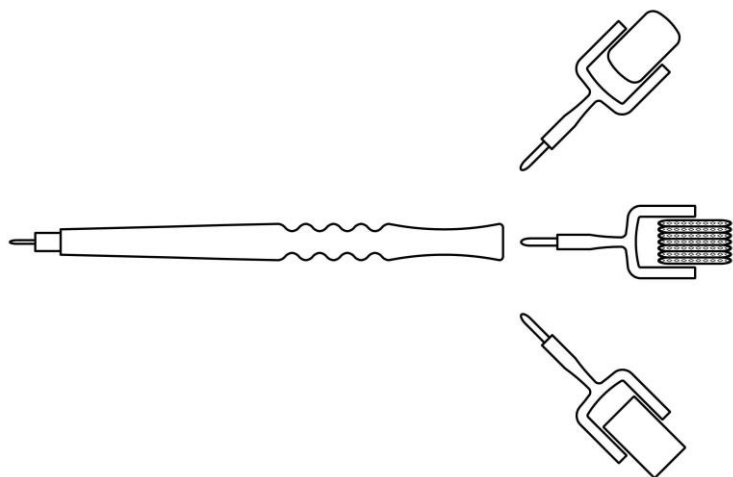
Electromaniples with needle electrodes; the diameter of the electrode is indicated by the color of the hand-grip.

**EM15 ELECTROMANIPLE (TDCE15)**

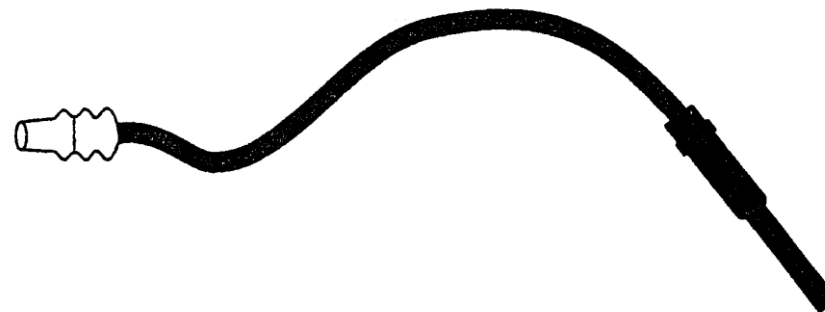


Electromaniple with cylindrical electrode, 1.5 mm diameter.

**ELECTROPORO COSMESIS' MANIPLES AND ELECTRODE**  
(part in contact with patient)

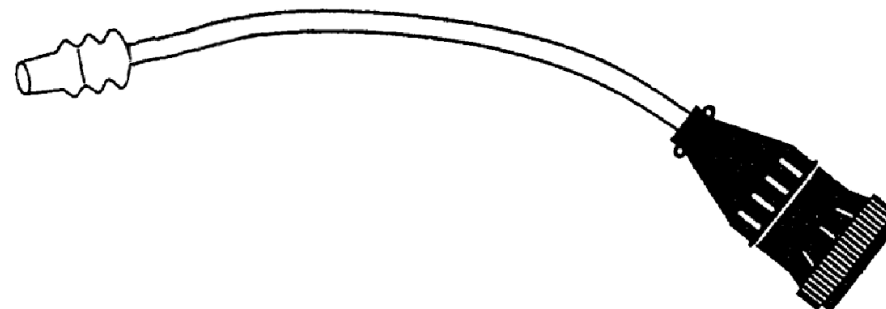


**CABLE WITH EA1 CONNECTOR (TDCU50)** (part not in contact with the patient)



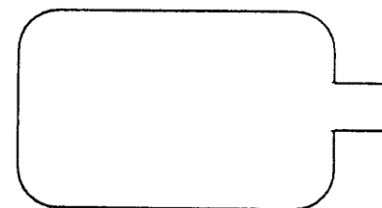
For connecting electromaniples to the apparatus.

**CABLE FOR USE IN BIPOLAR TECHNIQUES EM10 (TDCU51)**



Replaces the patient return electrode cable in the treatment of stellate angiomias.

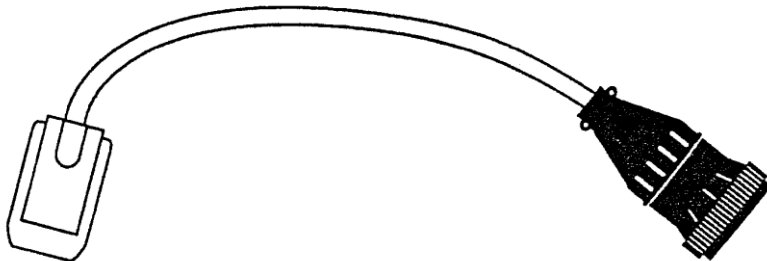
**PATIENT RETURN ELECTRODE (TDCP50)**





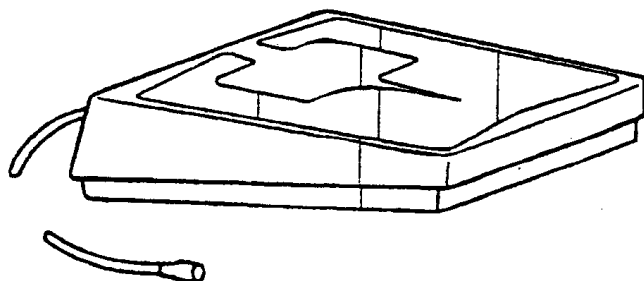
Close the circuit when the entire surface of the electrode is in contact with patient's skin.

**PATIENT RETURN ELECTRODE CABLE (TDCP50)**



Connects the re-usable or disposable adhesive patient return electrode to the *TIMED TD 50A Micropulse*

**PNEUMATIC PEDAL (DE 10)**



Controls diathermic emission.

**1.5 OTHER ACCESSORIES**

**POWER CABLE (TDCE21)**

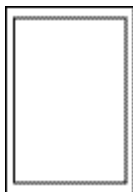


Connects the apparatus to the power supply.

## 2 WARNINGS

- 2.1** *TIMED TD 50A Micropulse* must only be used by qualified medical practitioners to cut and coagulate by means of a diathermic current. This apparatus is used in many surgical and medical specialties such as plastic surgery, vascular surgery, otorhinolaryngology, gynecology, dermatology. *TIMED TD 50A Micropulse* has been created expressly for use in diathermosurgery.
- 2.2** The apparatus must be opened for internal inspection only by authorized technical staff, after disconnection from the mains supply.
- 2.3** Read the instructions before use.
- 2.4** Skin-to-skin contact (for example between the arm and the body of the patient) must be avoided by inserting a dry gauze.
- 2.5** The apparatus must be connected to a properly earthed mains supply which conforms to safety standards.
- 2.6** The entire surface of the patient return electrode (TDCP50) must make good contact with the patient's skin. Poor contact may cause burns.
- 2.7** The patient must not come into contact with any metallic object which is connected to earth, or which may form a capacitance to earth.
- 2.8** When the programmable diathermocautery is used on a patient who is simultaneously connected to monitoring equipment, the monitor electrodes must be located as far as possible from the diathermosurgery electrodes. The monitoring equipment must not be fitted with needle electrodes. If electronic devices are used they must be guaranteed compatible with the electrosurgical devices by their producers. Special caution must be used for life support apparatus.
- 2.9** The diathermocautery electrode cables must not touch one other, the patient or other cables
- 2.10** Programming of the apparatus and selection of electrodes should be made after referring to "Programmed Diathermosurgery" by S. Capurro, or to the literature. In the case of a procedure which is not described, the power and emission time must be fine-tuned to achieve the desired result. Programmed data used should be recorded so that they may be used again in analogous procedures.
- 2.11** If the programming is correct and the effect is insufficient, the cause may be a poor external electrical contact (electrodes and cables).
- 2.12** During a diathermosurgery procedure, the surgeon is in contact with high-frequency current, either directly or through surgical instrument. Surgical gloves must maintain a sufficient degree of insulation for the duration of the procedure. Contact with vapors, liquids, oil and fat reduces insulation and therefore gloves must be frequently changed, in order to prevent burns.
- 2.13** In procedures involving the chest or head, the use of flammable anesthetics, oxidizing gases, such as nitrogen dioxide (NO<sub>2</sub>), or oxygen must be avoided, unless they are aspirated by special equipment or an AP class device is used. For cleaning and disinfecting, non-flammable substances should be used whenever possible. If flammable substances are used for cleaning, disinfecting or as solvents, they must be allowed to evaporate before activating the programmable diathermocautery. Flammable liquids may collect underneath the patient or in body cavities such as the navel or vagina; these must be removed before the apparatus is activated. The risk of igniting endogenous gases should be stressed. The arc produced by the apparatus at the highest powers might ignite cotton-wool or gauze if these are impregnated with oxygen.
- 2.14** Owing to possible damage and interference with cardiac pace-makers, the *TIMED TD 50A Micropulse* is not recommended for use with patients fitted with pace-makers or similar equipment. If in doubt, consult the cardiology department.
- 2.15** Keep the original packaging in case you need to transport your apparatus at a later date.
- 2.16** The apparatus must ONLY be plugged into sockets equipped with an earth wire that is connected to an efficient electrical system.
- 2.17** Proper functioning of the apparatus can be guaranteed only if original accessories are used.
- 2.18** WARNING. This apparatus must not be modified in any way
- 2.19** WARNING the apparatus must be used only with the original accessories furnished by the society' korpo srl. The use of other typologies of accessories could cause problems for the safety of the patient and the operator

### 3 CONTROLS



#### I/O • Main switch

The apparatus is on when the switch is in position I, and off in position 0. As soon as TIMED TD 0 A Micropulse is switched on, it automatically carries out an auto-test of the circuits and indicator lights.



#### CUT • Cutting function

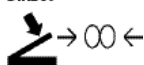
This function allows tissues to be sectioned with minimal damage to the edges of the cut. Needle electromaniples (**EM10**) are used and the output power may be set up to 50 Watt. In the DIRECT mode, TIMED TD 50 A Micropulse is used as a normal electrosurgical scalpel. In operations that require the maximum possible integrity of the edges, and in microsurgical operations, this function is used in the pulsed or timed mode, and the elasticity of the electromaniple is exploited (pulsed or timed programmed diathermic cutting). During the diathermic emission, a rapid trill is heard.



#### COAG MICRO ELECT • Coagulation with microelectrodes

Suitable for use with needle and smooth-tipped electromaniples, (**EM10 or EM15**) in dry fields, this function has a vast range of applications (see treatises: Programmed Diathermosurgery and Diathermosurgery, Edizioni D'Arsonval, Genoa Italy). It has a maximum output power of 49.5 Watt. During the diathermic emission, a slow trill is heard.

DIRECT



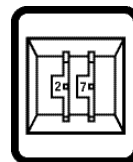
#### DIRECT • Direct function control

This sets the machine for an emission time controlled by the operator by means of the pneumatic pedal. High-frequency emission starts as soon as the pedal is pressed and lasts until the foot is lifted from the pedal. During the emission a continuous audible signal is generated. The emission time control must be set to 00, otherwise the set 00 indicator lights up, an intermittent alarm sounds and emission is prevented.



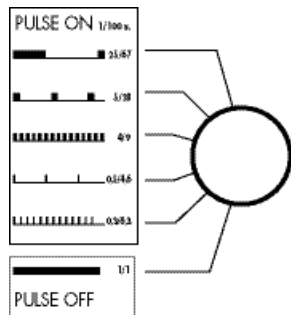
#### TIMED • Timed function control

This sets the machine for an emission timed in hundredths of a second. In the TIMED position the high frequency emission start as soon as the pneumatic pedal is pressed and lasts for the emission time preset on the emission time control. During the emission an acoustic signal is emitted.



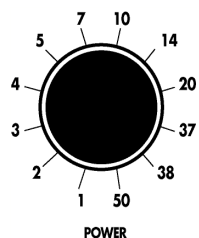
#### TIME 1/100 s • Emission time control

The sets emission duration of high frequency current to between 1 and 99 hundredths of a second when the apparatus is set to the TIMED mode. It consists of two separate selectors which set a two-digit number, the right-hand selector for units and the left-hand for tens: the number represents the (emission time) in hundredths of a second. The thumbwheels do not have a stop at the end of one full rotation; it is therefore possible to pass from 0 to 9 and vice versa. To program emission times below 10/100 s., the left-hand thumbwheel which increases emission times in increments of 10/100 s., must be set to 0; for example a time of 9/100 s = 09. Both thumbwheels must be set to zero for the machine to function in DIRECT. If the apparatus were able to function in DIRECT with any value of emission time set, and the operator inadvertently pressed the DIRECT control, the emission time would be controlled directly by means of the pneumatic pedal. This would result in a different emission time from the original setting. With TIMED TD 50 A Micropulse such an error, which might produce undesired lesion effects, is avoided. When the emission time control TIME 1/100 S. is set to a time other than 00 and the DIRECT control is pressed, emission is prevented, the set 00 warning light comes on and an alarm sounds. When the emission time control TIME 1/100 s is set to 00 and the timed function control TIMED is pressed there is no emission; there is no continuous audible alarm but the indicator lights up. This means that the TIMED, DIRECT, and TIME 1/100 s control must be correctly set before operation can commence and offers a high degree of certainty of correct programming.



### PULSE Pulsed and non-pulsed functions

In the OFF position, the pulsed functions are excluded. In the ON position, 5 modes of pulsed functioning may be programmed, each of which is designed for a specific Diathermosurgery technique (see literature). The pulsed emissions may be timed by selecting the TIMED mode and setting the TIME 1/100 s control to the desired emission. Alternatively, the duration of the pulsed emissions may be directly controlled by means of the pedal; in this case the DIRECT mode will be selected and the Time 1/100 control set the 00.



### POWER OUTPUT CONTROL

This sets the high-frequency output current. Turning the knob clockwise increases power in discrete proportional steps. If the knob is rapidly turned through several increments, the internal failure/power verification warning may light up and an intermittent alarm may be heard. This indicates that the apparatus is carrying out a check of the new value set; until the check is complete, high-frequency emission is prevented. The high-frequency output of the TIMED TD 50 A Micropulse is stable and precise; it does not change from one machine to another, during prolonged use or with variation of ambient conditions. The power scale has been chosen for surgical, micro-surgical and dermatological applications for programmed diathermosurgery. There are twelve power settings: 1, 2, 3, 4, 5, 7, 10, 14, 20, 27, 38 and 50 Watts.

## 4 SAFETY SYSTEMS

### 4.1 AUTO DIAGNOSTIC SYSTEM

*TIMED TD 50A Micropulse* has been designed to make its use simple and safe. It has an extensive auto diagnostic system whose main function is to prevent any danger to patient or operator. It also alerts the user to any defects in the machine or accessories which could result in hazardous situations, such as emissions that are more powerful or of longer duration than programmed by the operator. These are identified by the auto diagnostic system, which prevents emission of high frequency current and signal the fault by means of an intermittent acoustic alarm and a red warning light. These are identified by the auto diagnostic system, which prevents emissions of high frequency current and signal the fault by means of an intermittent acoustic alarm and a red warning light.

### 4.2 PATIENT RETURN ELECTRODE NOT CONNECTED

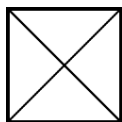


A circuit monitors the neutral electrode and reveals improper or defective connection of the electrode to the patient skin or the apparatus; it also indicates accidental contact of the electrode active with metallic objects or persons other than the patient.

When the alarm is activated an intermittent acoustic signal is heard; an indicator lights up near to the patient return electrode output and high-frequency emission is stopped.

The circuit compares the current emitted from the active electrode with that returning through the neutral electrode and stops emission should there be any disparity which could result in harm.

### 4.3 INTERNAL FAULT/POWER CHECK



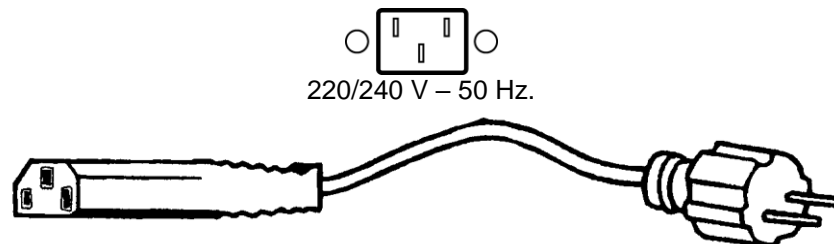
In the case of an internal fault the yellow internal fault/power check indicator will light up, an intermittent acoustic alarm will be given and high-frequency emission will be interrupted. Faults in the timer, power supply or high-frequency generator will trigger the alarm. This monitoring circuit is separate and independent

from the main circuit; as there are no shared components, any breakdown in one circuit will leave the other intact.

If the power output control is rotated rapidly through several steps, *TIMED TD 50A Micropulse* carries out a check of the internal power values and for a brief period the internal fault/power check indicator will light up.

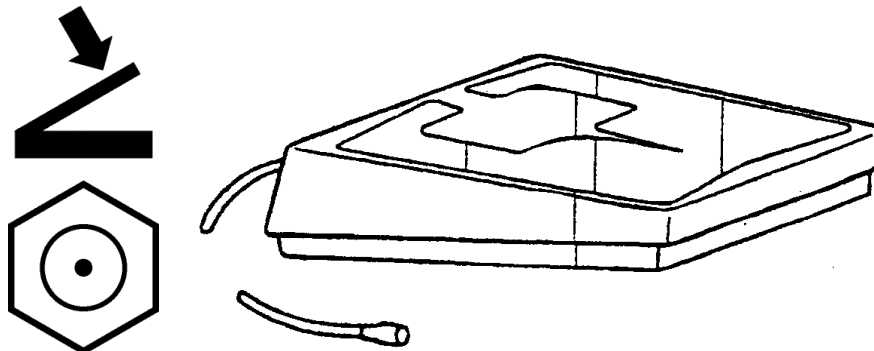
## 5 SETTING UP FOR USE

### 5.1 POWER SUPPLY



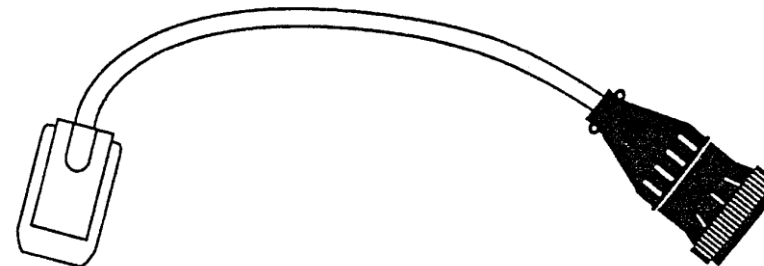
Plug power cable (TDCE21) into the socket on the rear panel. Connect the other end of the cable to a suitable 220/240 V 50 Hz. outlet

### 5.2 PNEUMATIC PEDAL



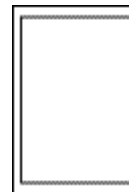
Connect the tube of the pneumatic pedal (TDDE10) to the connector on the rear panel.

### 5.3 CONNECTION OF ELECTRODE CABLES



Insert the connector of the patient return electrode cable (TDCP50) into the outlet on the front panel.

### 5.4 SWITCHING ON



Switch the green mains switch to position 1. The apparatus will run through an auto-test and then switch itself to stand-by.

## 6 PREPARATION OF THE PATIENT

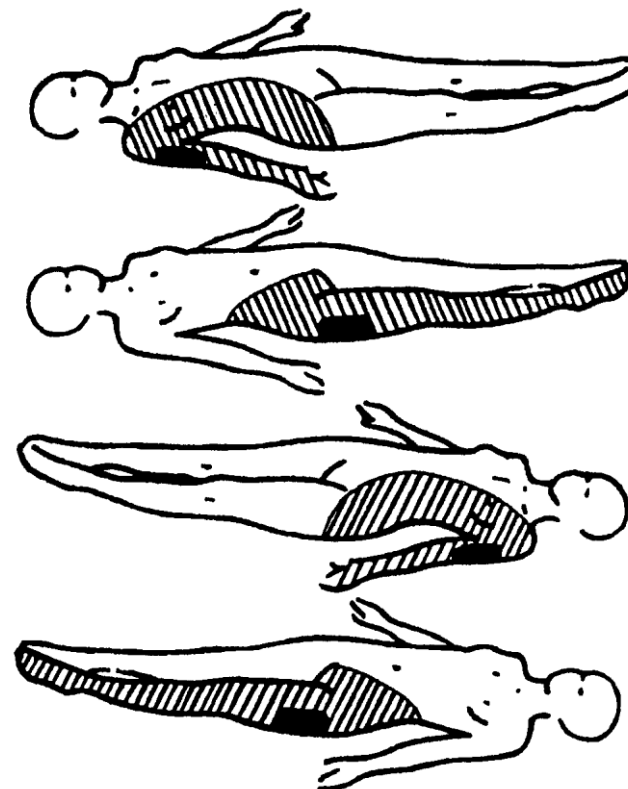
### 6.1 PREPARATION OF THE PATIENT UNDER GENERAL ANESTHESIA

Remove jewelers and any metallic objects from the patient. Lay the patient on a dry non-conductive mattress. The operating table must be not wet. Parts of the body which are inclined to produce excessive sweating should be prevented by use of dry gauze. Skin/skin contact should be prevented by the use of dry gauze. Do not use conductive breathing tubes. To prevent collection of liquids under the patient do not spray liquid detergents of disinfectants. Skin detergents, oily substances and flammable disinfectants must be evaporated completely before diathermic current is used. During surgical intervention the patient must not come into contact with conductive objects which are connected to earth or which have a high capacitance (large size).

### 6.2 APPLICATION OF THE PATIENT RETURN ELECTRODE (CP50)

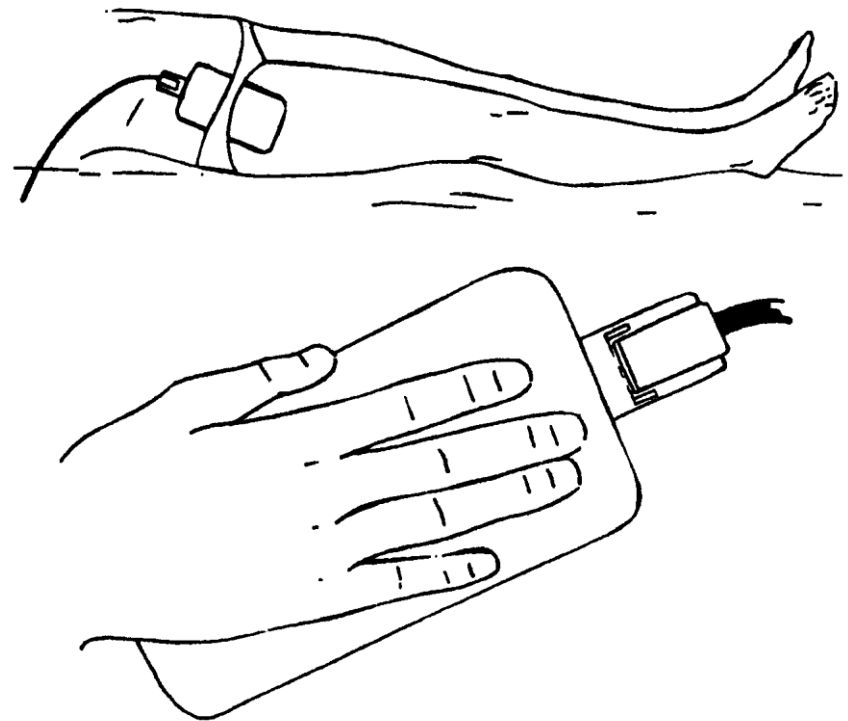
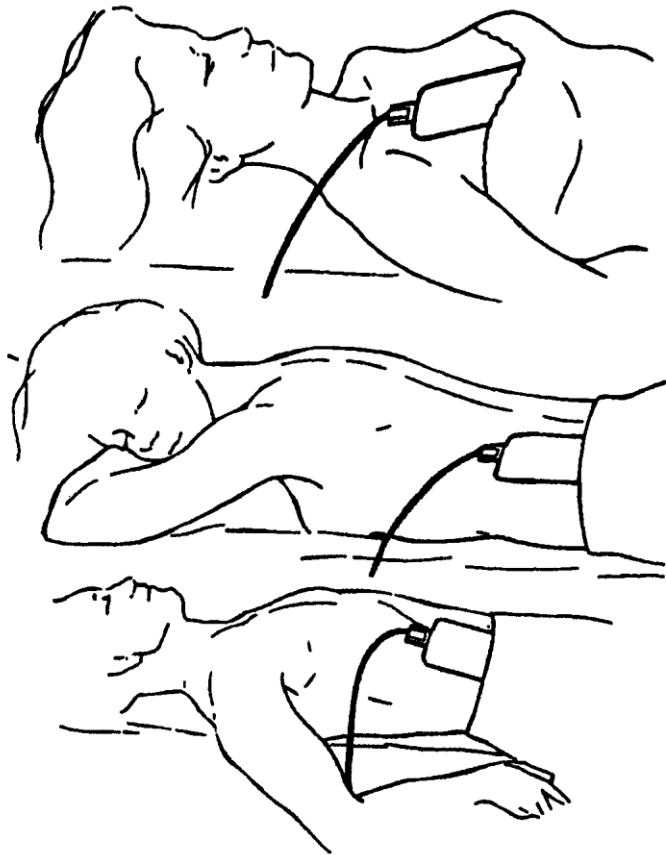
*TIMED TD 50A Micropulse* is not designed to operate without a patient return electrode. The diathermic current which flows through the patient from the active electrode must return through this neutral electrode. The current pathway through the patient should be as short as possible. The neutral electrode should be positioned as close as possible to the operating area.

The active electrode cable and the neutral electrode cable (**CP50**) must not come into contact with the patient or with other cables. They must not be lengthened or tangled. The neutral electrode must make full contact with the patient's skin. An irregular or insufficient contact might cause burns. *TIMED TD 50A Micropulse* has a sophisticated safety circuit which monitors the correct use of the patient electrode. This blocks diathermic emission in a few milliseconds if the energy flowing into the patient through the active electrode exceeds that returning through the neutral electrode. The neutral electrode must not be placed over scar tissue, prominent bones, metallic prostheses or regions of the body under pressure from body weight (absence of blood flow). In patients under general anesthesia, shave the area where the neutral electrode is to be applied. Clean the skin and remove oil and grease. Do not use substances which might dry the skin excessively, as this will increase resistance between the skin and the electrode. Massage the area of application to improve circulation and conductivity of the skin. Apply the patient return electrode according to the illustration.



### 6.3 CONSCIOUS PATIENTS

The neutral electrode may be held in place by the patient's clothing or by the use of a bandage. The sterilisable metal plate must be positioned near to the site of the operation and the whole surface must be in contact.



Positioning of the non-adhesive neutral electrode (CP50)

### 6.4 APPLICATION OF ECG ELECTRODES

The electrocardiograph must be equipped with a suppressor of high-frequency interference. Use only electrodes intended for use in conjunction with diathermocautery. To avoid current dispersion, do not place ECG electrodes between the site of the operation and the neutral electrode. Do not use needle electrodes (or syringes) as ECG electrodes. Never use the active electrode of the diathermocautery near to an ECG electrode; the minimum distance must be 15 cm.



## 7 PROGRAMMING

After preparing the patient, choose TIMED or DIRECT mode. In TIMED it is necessary to set TIME 1/100s to the diathermic emission time required; in DIRECT set 00:

- ✓ Choose the appropriate function: Cut or Coag Micro Elect.
- ✓ Set power with the power output control.
- ✓ Using the Pulse on/off control, select the non-pulsed function or one of the 5 pulsed functions.
- ✓ Choose the active electrode and connect the appropriate cable to the socket ACTIVE ELECTRODE OUTLET.
- ✓ To choose program data, refer to the literature.

On pressing the pneumatic pedal, the characteristic acoustic signal will be heard according to the function selected: cutting (cut) or coagulation (COAG MICRO ELECT).

### Examples of program data from:

DIATERMOCHIRURGIA PROGRAMMATA e TIMEDCHIRURGIA, Sergio Capurro, Published by D'Arsonval GENOVA 1993 – 2000

USE	MODE	TIME	FUNCTION	POWER	ELECTROMANIPLE
TREATMENT OF TELANGIECTASIA OF THE FACE	Timed	5/100 s	Coag micro electrode	7 W	EM10 Green
PROGRAMMED DIATHERMIC MICRO-CUTTING	Timed	2/100 s	Cut	38 W	EM10 White
DIATHERMIC DE-EPITALIASATION	Direct		Coag micro electrode	1 W	EM10 Yellow (edge of the angle)

### 7.1 DURATA DELL'EMISSIONE DI ALTA FREQUENZA NELLE FUNZIONI PULSATE

USE	Control setting in the PULSE ON sector	ON Time	OFF Time	TOTAL Time
DEPILATION	25/67	24/100 s	41.3/100 s	65.3/100 s
TELEANGIECTASIAS AND NEOFORMATIONS	5/29	5/100 s	24/100 s	29/100 s
DE-EPITHELIALISATION	4/9	4/100 s	5/100 s	9/100 s
SLOW PULSED CUTTING	0.5/24.5	0.5/100 s	24/100 s	25/100 s
RESURFACING AND RAPID PULSED CUTTING	0.3/5.3	0.34/100 s	5/100 s	5.34/100 s

## 8 ELECTRODES

### 8.1 ACTIVE ELECTRODES AND NEUTRAL ELECTRODES

The diathermic current flows from the active electrode to the neutral electrode. The passage of the current causes a therapeutic lesion in the region of the active electrode. In the region of the neutral electrode, which has a far greater surface area, the tissues remain intact.

### 8.2 ELECTROMANIPLES

The electromaniples form an integral part of many techniques in programmed diathermosurgery.

The electromaniples (**EM10**, **EM15**) consists of an electrode moulded into an anatomically shaped hand-grip, made of plastic (polyamide). The hand-grip has a small connector to enable connection to the socket of the active electrode cable (EA1).

The **EM10** are fitted with conical needle microelectrodes made of stainless steel. The electrode dimensions are distinguishable by means of the color-coded hand grips.

• EM10 White	0.08 mm of diameter	(CEW1)
• EM10 Green	0.10 mm of diameter	(CEV1)
• EM10 Grey	0.15 mm of diameter	(CEG1)
• EM10 Yellow	0.20 mm of diameter	(CEY1)
• EM10 Black	0.30 mm of diameter	(CEB1)

The **EM10** are reusable. They are also available with PTFE sleeved electrodes (TDCEV1 and TDCEG1).

The **EM15** has a stainless steel microelectrode of 1.5 mm diameter, cylindrical in section and with a smooth tip. The connection plug is gold plated. This electromaniple is durable.

The active electrode cable (EA1) consists of a gold-plated female connector for connection of the electromaniple and a highly flexible cable, insulated with silicone rubber, and terminating in a connector for connection to the *TIMED TD 50A Micropulse*.

For use in bipolar techniques with two **EM10** electromaniples, an EA1 is available equipped with a plug that fits the patient return electrode cable. When this technique is used, the **EM10** electromaniple connected to the neutral electrode outlet, as it actually replaces the patient return electrode. The **EM10**

electromaniples and the EA1 cable are subject to deterioration with prolonged use it is recommended that spares always be kept ready for use.

### 8.3 OTHER MONOPOLAR ELECTRODES

Korpo s.r.l. Guarantees correspondence to the stated technical characteristics only if original or approved accessories are used.

### 8.4 ELECTROPORO COSMESIS ELECTRODES

Electroporo cosmesis electrodes are used for a timed surgery cosmetic treatment.

Thanks to the electroporo cosmesis is possible to apply on the cutaneous surface of the skin an high frequency current that will take off the little cutaneous imperfections and then with a microporation of the epidermis we will obtain the peeling of the skin. current will pass through the patented electrodes that are made by plastic materials (medical abs) and covered with high conductive metals. high frequency current must be used with a low medium power and this is the reason why use the timed surgical resurfacing function at 0.3/5.3 second where the power is less than 3 watt.

The Kit Roll electrode are not reusable and not sterile. They have to be clean before using. The bottom of the maniple is made in order to contain inside of it the different kind of Electroporocosmesis electrodes, rotating....

Please be sure that the electrodes are strongly fixed inside the maniple.

Please make sure that the apparatus is working properly before using it passing the electrodes on your hand before having switch it on.

Keep the product away from inflammable materials: if they are accidentally turn on the heat can cause fire.

When product are not in use please keep it in a safe place inside proper boxes. Please be aware to fix the patient return electrode in touch with the patient skin close to the treated area. Please be careful to avoid that the active cable be in contact with the patient skin and to avoid knots. If the patient change the position please check again every connection. Please make sure that the apparatus is working properly before using it.

During the procedure always start from the lower energy level. Operator must correctly keep moving the rotating electrode on the patient skin in order to avoid a local heating.

## **8.5 DISINFECTING THE ELECTROPORO COSMESIS ELECTRODES**

Electromaniples and electrodes must be cleaned with a damp cloth, disinfected with an aqueous solution (for example benzalkonium chloride) before using.  
Electromaniples and electrodes are disposable product.

## 9 CLEANING, DISINFECTING AND STERILIZING

### 9.1 CLEANING AND DISINFECTING THE *TIMED TD 50A Micropulse*

Before cleaning and disinfecting the apparatus, disconnect it from the mains supply.

Do not use solvents of plastics or abrasive materials. Do not spill water or other liquids onto the apparatus. *TIMED TD 50A Micropulse* must be cleaned with a damp cloth, disinfected with an aqueous solution (for example benzalkonium chloride) and then dried. The apparatus must not come into contact with gaseous disinfectants. If the room in which the *TIMED TD 50 A Micropulse* is situated is to be sterilized with gas, the apparatus must be protected with a plastic cover. The apparatus must not be used in the presence of disinfectants which form explosive or inflammable mixtures. Do not autoclave or gas sterilize the apparatus.

### 9.2 CLEANING AND STERILIZING THE ELECTRODES

The electromaniples must have organic tissue particles removed from them with a damp gauze or abrasive paper (P1000).

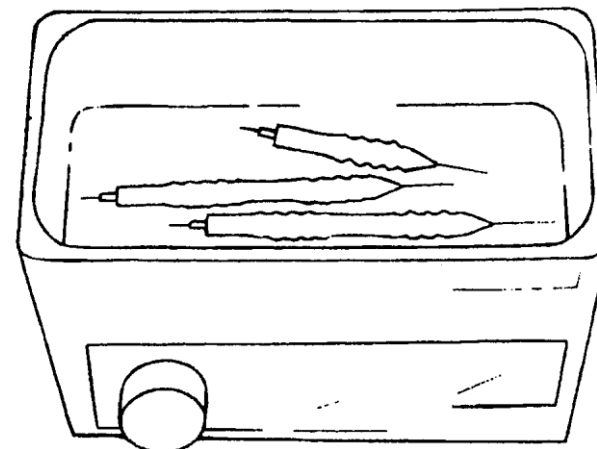
The electromaniples equipped with needle electrodes should be cleaned preferably in an ultrasonic bath.

After cleaning, the electrodes should be dried and then sterilized in an autoclave at 125° C for 15 min.

#### CAUTION:

**Do not autoclave the electrodes at temperatures higher than 125° C. Higher temperatures will damage the materials used in their construction. The reusable neutral electrode can be sterilized in the autoclave after cleaning.**

Ultrasonic bath



### 9.3 CLEANING AND STERILIZING ELECTRODE CABLES

The monopolar neutral electrode cables can be cleaned by delicate hand-washing or ultrasonic bath. After cleaning, they must be carefully dried in order to avoid the penetration of liquids into the connectors. During sterilization in an autoclave at 125°, the cables must not be too tightly wound, in order to avoid damage. The cables must be protected with gauze or placed in an appropriate package during sterilization. After gas sterilization, the cables should be properly aired.

CAUTION: do not autoclave the cables at temperatures higher than 125° C. Higher temperature will damage the materials used and electrical connections.

### 9.4 CLEANING AND DISINFECTING THE PNEUMATIC PEDAL

Once the pneumatic pedal and tube have been washed, they are disinfected with gauze soaked in an aqueous disinfectant (e.g. benzalkonium chloride). Care should be taken to ensure that no liquid gets inside.

## 10 TROUBLESHOOTING: ANALYSIS OF POSSIBLE FAULTS

### 10.1 When the mains switch is switched to position I, no indicators light up and no intermittent acoustic signal is heard.

#### A. Power cable not connected

Check that the power cable is correctly connected to the apparatus and the mains supply.

#### B. Power cable is connected but there is no power

Check that the mains socket is supplying the correct voltage. Disconnect the mains lead of the TIMED TD 50 A Micropulse and check the mains outlet by plugging a lamp into it. If there is no current, have the mains supply checked by qualified electrician.

#### C. Blown fuses

Disconnect the power cable from the mains supply and replace the fuses with new ones. Re-connect to the mains supply and check whether the apparatus is functioning.

#### D. Damage to the power cable

Check to see if the power cable conductors are broken. If necessary, replace the cable with a new one (type H05VVF).

#### E. Other causes

If after carrying out the above tests, the apparatus is still not working, return it to the supplier for maintenance, together with accessories, stating the fault and which checks have been carried out.

### 10.2 An acoustic alarm is heard, a red light indicator comes on and there is no high-frequency emission on pressing the pneumatic pedal.

#### A. Operation of the power control

Immediately after a change in power output setting, the internal fault/power verification indicator may light up for a few seconds, with interruption of high-frequency emissions until the auto-test is complete.

#### B. Internal failure safety circuit in operation

If the internal fault/power verification indicator remains lit after completion of the auto-test, switch the apparatus off and switch on again. If the internal fault/power verification indicator is still on, the apparatus must be returned for repair.

#### C. Neutral electrode safety circuit in operation

If the neutral electrode alarm is given, check:

- that the connectors of the neutral electrode cable are correctly connected to the socket on the front panel of the apparatus and the neutral electrode..
- that the contact between the neutral electrode and the patient's skin is satisfactory.
- that the active electrode is not in contact with any metallic object.
- that the neutral electrode cable is not broken.

After carrying out these checks switch off the *TIMED TD 50A Micropulse* and switch on again after a few seconds. If the safety test circuit indicator remains on after the auto-test, change the neutral electrode cable. This safety circuit will also operate the indicator and block high-frequency emissions if the active electrode touches objects or persons other than the patient during diathermic emission.

#### D. Zero/non-zero setting

In DIRECT, if a time other than 00 is set on the control Time 1/100s, there will be no high-frequency emission, an intermittent alarm will be heard and zero/non-zero setting indicator will light up. If the Time 1/100s control is set to 00 and the pedal is pressed while in the Timed mode, the alarm will sound for a few seconds and the zero/non-zero setting indicator will light up.

### 10.3 After the auto-test and pressing the pneumatic pedal, no acoustic signal is heard.

#### A. Pneumatic pedal not operate correctly

Unless the pneumatic pedal is fully depressed and completely released between emission, *TIMED TD 50A Micropulse* will not receive the signal to generate an emission.

#### B. Defective pneumatic pedal

Check that the tube is connected to the rear panel of the apparatus. When the pedal is depressed, a click should be heard inside the apparatus. If these tests do not rectify the situation, check the pneumatic pedal and if necessary replace it.

**C. Other faults**

In the case of faults not covered by the preceding analysis, return the apparatus for repair, together with accessories and specify the fault and tests which have been carried out.

**10.4 If, when operating the pneumatic pedal the emission sound is heard but the emission has an inadequate effect.**

**A. Defective electrode or cable**

If the active electrode cable (EA1) is broken, high-frequency current will not flow to the patient, or an intermittent current flow might be obtained. Such a fault is easily identified by applying a slight tension to the cable; if the conductor is broken, the cable will stretch. If the active electrodes are dirty, worn or in any way physically damaged, the lesional effect produced will be less than required. It is advisable to keep a stock of replacement active electrodes and cables.

**B. Regulation of power and emission duration**

For appropriate programming, check the manufacture's guide supplied with the equipment. Find an equivalent procedure, or one that is the most similar to the one which is to be carried out, with respect to the type of lesion produced and electrode used and ensure that programming is set according to the examples given.

**10.5 During auto-test, the indicators do not light up correctly.**

If the following indicators do not light up during the auto-test:

- Zero/non-zero time setting indicator
- Internal fault/power check
- Neutral electrode (TDCP50) not connected

Return the apparatus for repair and specify the fault.

## 11 TECHNICAL FEATURES

### 11.1 CONSTRUCTION

Model	
Type	Programmable diathermocautery, designed for use in microsurgery and surgical dermatology
Construction	Totally solid state
Functional Mode	Timed and direct with manual switching

Function type	
Cut	Cutting
Coag Micro Elect	Coagulation with micro-electrodes
Power Regulation	Incremental in proportional steps
Patient Circuit	Insulated at high and low frequencies
Safety Circuit	Internal fault – Power check – Patient return electrode - Unintentional setting of the “direct” control 00.

Acoustic Signals	
Rapid trill	Cutting
Slow trill	Coagulation with microelectrodes
Continuous trill	Direct function
Intermittent tone	Safety circuit alarm
Pulsed trill	Pulsed function
Single-emission tone	Timed set to timed mode
Monopolar hf outlet	With two non-reversible connectors
Type of emission control	Pneumatic pedal

Immunity to short-circuit and open circuit	Unlimited
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### CLASSIFICATION

Class 1 apparatus
Built in CF device
Non-liquid - proof casting
Not suitable for use in the presence of flammable anesthetic mixtures with air, oxygen or nitrogen peroxide

### 11.2 ELECTRICAL FEATURES OF THE SUPPLY

Power supply	220V – 240V / 50Hz.
Maximum power absorbed	
Cutting	100 VA
Coag micro elect	100 VA
Earth circuit resistance	<150 mΩ
Earth leakage current	<20 μA
Internal leakage current	<10 μA
Patient leakage current	<5 μA
Patient auxiliary current	<2 μA

### 11.3 ELECTRICAL FEATURES OF THE OUTPUTS

Frequency	920 kHz
<b>Maximum output power</b>	
Cutting	49.5 W / 800 $\Omega$
Coag micro elect	49.5 W / 800 $\Omega$
<b>Maximum open circuit output voltage with accessories connected</b>	
Cutting	420 V pK
Coag micro elect	580 V Pk
<b>High frequency leakage current</b>	
With electromaniple and return electrode	In accordance with IEC 601-2-2 class CF <150 mA
Timing	Analog from 1/100 to 99/100 in steps of 1/100 Precision within 5% of set value
Mains protection fuses	0.3 A, 250 V, ultra rapid 5x20
Radioemission	In accordance with CISPR 11 and VDE 0750 and EN 60601-1-2

### 11.4 MECHANICAL CHARACTERISTICS

COOLING	Natural convection
WEIGHT EXCLUDING ACCESSORIES	8 Kg
HEIGHT	117 mm
WIDTH	416 mm
DEPTH	350 mm

### 11.5 AMBIENT CONDITIONS

Condition	TRANSPORT AND STORAGE	IN OPERATION
<b>AMBIENT TEMPERATURE</b>	From -40° C to +70° C	from 10° C to 40° C
<b>RELATIVE HUMIDITY</b>	from 10% to 100% including condensation	from 30% to 75%
<b>ATMOSPHERIC PRESSURE</b>	from 500 hPa to 1060 hPa	from 700 hPa to 1060 hPa

### 11.6 OUTPUT CURVES

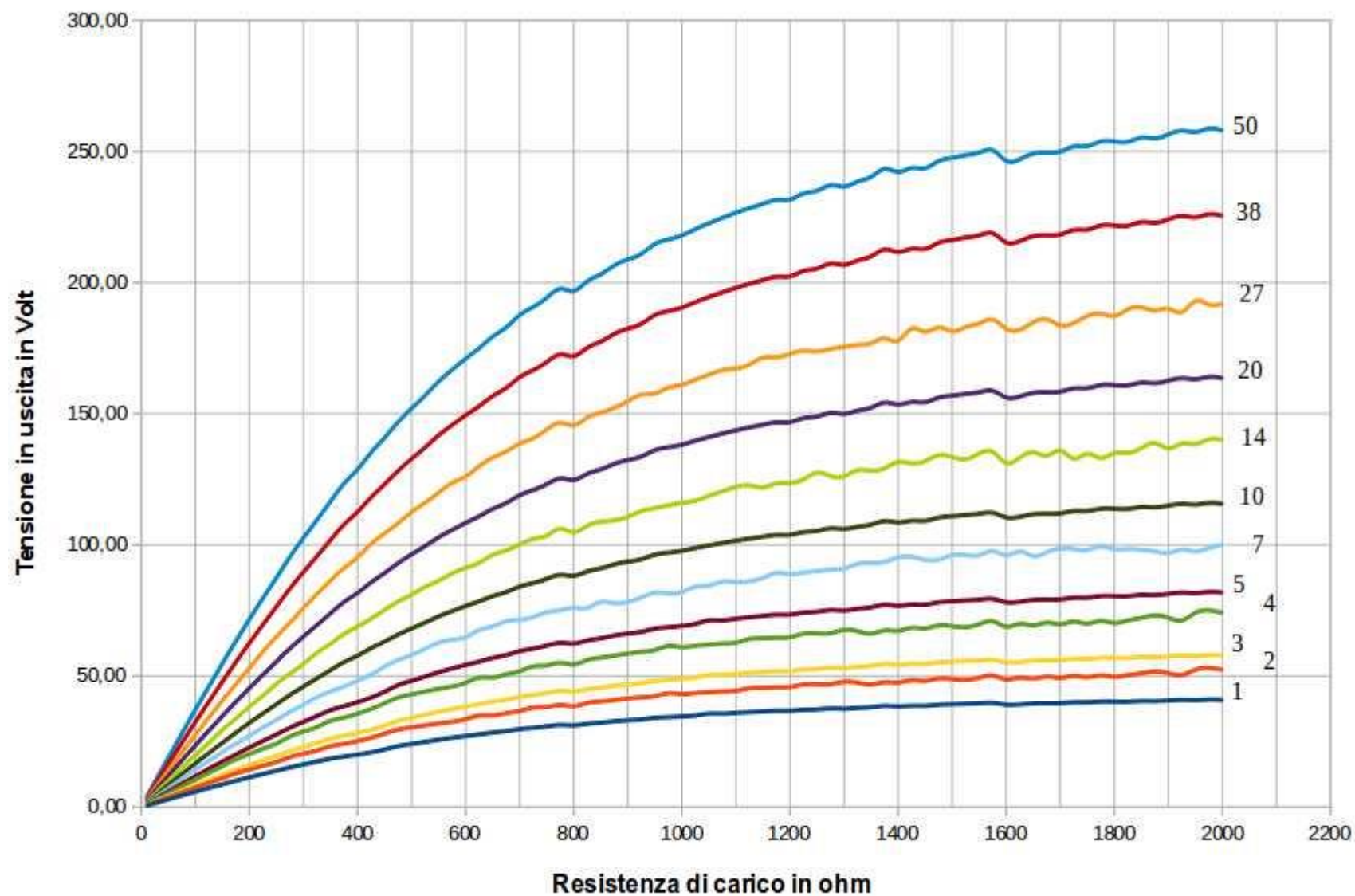
The output curves represents the output power [W] obtained with a resistive load [ $\Omega$ ] connected to the diathermy outlet.

In every graph each curve corresponds to one of the twelve positions of the output control.

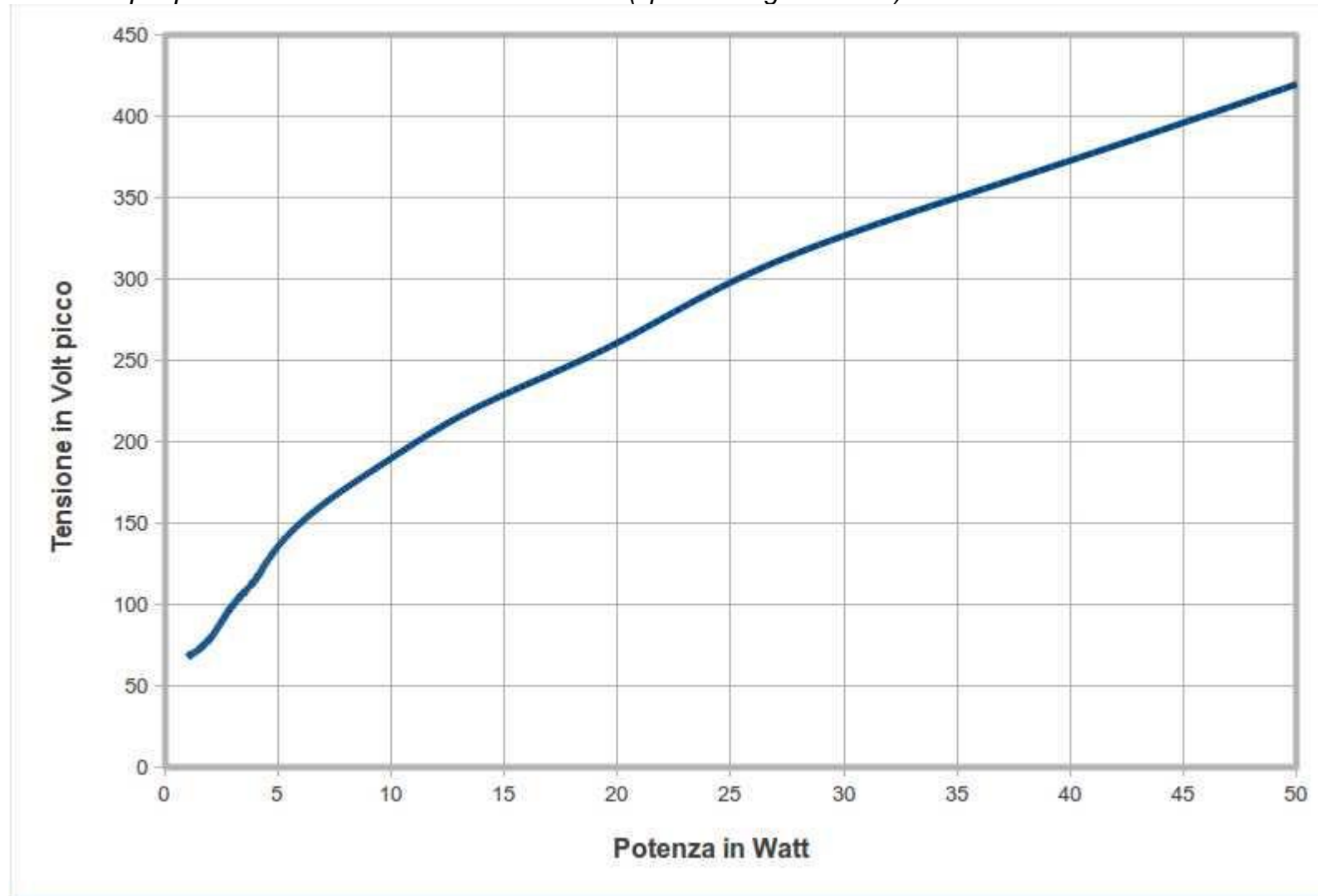
In both functions, CUT- COAG MICRO ELECT, the curves remain unchanged.

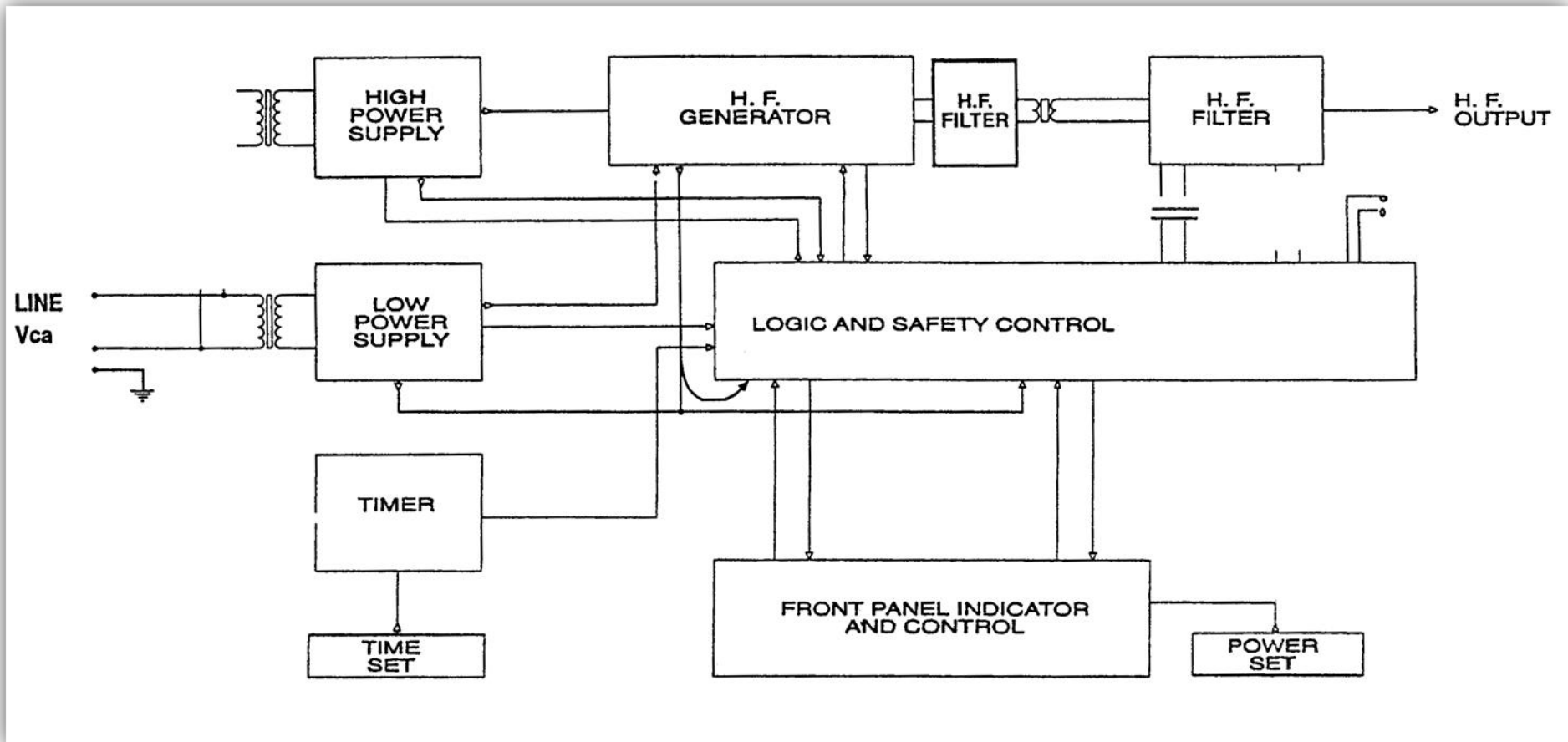


### 11.6.1 Output power as a function of load resistance



11.6.2 Output power as a function of load resistance (typical charge  $800\ \Omega$ )





## 11.7 BLOCK DIAGRAM OF ELECTRICAL CONSTRUCTION

## 12 PERIODIC SAFETY INSPECTIONS

### 12.1 INTRODUCTION

At least once every 12 months the following checks should be carried out by a qualified technician.

### 12.2 APPARATUS

- ✓ Check for any sign of physical damage to the apparatus and ensure that all written indications are legible.
- ✓ Check that the auto-test functions when the machine is switched on.
- ✓ Check that neither the power cable (TDCE21) nor the electrical connections are broken.
- ✓ Check the acoustic signals during high-frequency emission.

### 12.3 TESTING THE NEUTRAL ELECTRODE SAFETY SYSTEM

Every six months the following tests on the neutral electrode protection circuit should be carried out:

Switch on *TIMED TD 50A Micropulse* without connecting the neutral lead (TDCP50) to the outlet. Ensure that the high-frequency emission is blocked.

### 12.4 TESTING THE INTERNAL FAULT/POWER CHECK CIRCUIT

Rotate the power Output Control rapidly through several increments. The Internal Fault/Power Check indicator should light up momentarily and an acoustic alarm should sound.

### 12.5 REPLACING FUSE

Fuses are removed by pressing the fuse-cover with a screwdriver and turning anticlockwise. The new fuse is inserted and the cover fixed by turning clockwise.

### 12.6 REPAIRS

Korpo s.r.l. provides its Service Centers in Italy and abroad with all necessary instructions for the repair and regulation of the apparatus, including replacement of electronic circuit-boards.

### 12.7 WARRANTY

The *TIMED TD 50 A Micropulse* programmable diathermocaustery is guaranteed from a period of one year from the date of purchase. Please

detach, fill in and forward the Guarantee Certificate to Korpo s.r.l. within 10 days of purchase, ensuring that it has been stamped and dated by the retailer. Failure to send in the Guarantee Certificate within the specified time, or interference with the apparatus by unauthorized persons will invalidate the warranty.

### 12.8 MANUFACTURER'S RESPONSIBILITY

The manufacturer, assembler, installer or importer will accept responsibility for the safety, reliability and performance of the apparatus only if:

- ✓ The tasks of assembly, regulation, modification or repair are carried out by specifically authorized persons.
- ✓ The electrical system of the building in which the apparatus is to be used conforms to the prescribed standards..
- ✓ The apparatus is used in conformity with the instructions given in this manual.

### 12.9 DISPOSING OF DEFUNCT EQUIPMENT



In conformity with the "RAEE" 2002/96 EU directive and Legislative Decree 151 of 25/07/2005, the equipment produced by Korpo S.r.l. and any attached parts are not to be disposed of as household refuse; they are subject to separate disposal, which must be carried out at the refuse collection centres appointed by the local authorities. The "barred rubbish bin" symbol placed on the equipment indicates that disposal as household refuse is forbidden and that separate disposal is obligatory.

Korpo S.r.l. offers clients a free collection service for any equipment that it has supplied, provided that a new, equivalent piece of equipment, or one that performs the same functions, is purchased. Improper disposal of equipment or constituent parts is potentially harmful to the environment and human health, as is the improper use of such equipment, and is subject to the sanctions imposed by local authorities.

***TIMED TD 50A Micropulse USER MANUAL***

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