HF 5000

USER'S MANUAL

INDEX:

INTRODUCTION

Thank you for the trust you placed in us and in the equipment you just acquired. With it you will be able to bring the most **advanced technology** in **electro-aesthetics** and to introduce a tool that will become essential to secure good results.

This equipment provides you with an advanced option of cleansing and facial treatment. User-friendly, this equipment has been conceived to fully satisfy the requirements of the most demanding users. This machine has been subject to technical and application tests to guarantee its quality and results.

Our company also provides practical and advanced courses in facial treatment technique. This new service aims at giving the user the best knowledge possible in order to obtain high quality results. Information on our courses is available in our web pages (www.ema.es).

Before starting up the equipment, please **READ CAREFULLY this MANUAL**. Failing to do so could turn out to be dangerous and provoke damage to third parties.

We invite you to contact us or our distributor for any doubt or query. We would be delighted to assist you.

Yours sincerely,

The Management

SAFETY STANDARDS

This equipment complies with the **safety standards** in force at the time of manufacturing. However, the following safety recommendations should be observed:

1. Before handling the equipment, read carefully this manual.

2. The client's electrical safety is ensured by a double insulation from the mains. Do not however connect to a socket deprived of an earth connection. The machine must be connected to an earth plate provided with an **earth conductor**. Never connect to a system deprived of a differential switch.

3. Do **not** use on customers with a **pacemaker**.

4. Always place the accessories when the power button indicates **zero**.

5. This equipment must be used following the instructions of **qualified personnel** (for example, graduated beauticians).

WARNING:
This equipment is not a medico-sanitary product, not aiming at diagnosing, controlling, monitoring or relieving any disease, injury or deficiency.
Always use cosmetic products complying with the law in force.
In case of doubts concerning the application on a specific client, consult a specialist.

GENERAL POINTS

HF 5000 is a high frequency equipment for cabins. It includes multi-use application electrodes. Its elegant design and the quality of its components make of HF 5000 an indispensable element for any beauty salon. HF 5000 includes elevation legs that facilitate its handling.

TECHNICAL FEATURES

- High frequency equipment.
- Includes 6 electrodes.
- Elevating legs.
- User-friendly.
- Provided with the necessary accessories for all functions.

- Supply voltage: 230 V (110V on request)
- Input: 25 W
- Weight: 3,2 Kg
- Dimensions: 350 x 280x 140 mm
- Ground connection: the machine is provided with a ground connection through its mains cable. Connect to installations equipped with that connection.
- Safety: the machine remains insulated from the mains through a coil transformer.

This equipment uses radio frequency **currents** for treatments. The possible radio disturbances have been minimised. However, conditions specific to the premises (e.g.: earth plate which resistance is too high) can reduce even more these possible disturbances. **Additional measures** can be taken to this end. The following measures are recommended whenever possible:

a. The presence of an **independent earth conductor** used for electro-therapy equipments only.

b. The equipments must be located in a **Faraday** cage protected room.

Non-ionising radiation at the different levels and powers of the equipment **does not cause any effect harmful to health**, since its use does not require any further precaution from the person qualified to apply an appropriate treatment on the customer.

This symbol aims at dissuading the use of the apparatus by personnel non qualified or newly introduced to its use, warning of the possible adverse effects that an improper use could provoke on the client.

This equipment provides a special protection rate against electrical discharge, particularly in relation with the authorised leakage current and the reliability of the earth connection.

This symbol shows that high voltage generated in the high frequency control output cannot produce an electric shock.

CE

Description of the controls

0.- **Fuse**.

1.- Receptacle.

2. – Main on/off **switch**

3.- High frequency **power** control.

4.- **Outlet** for the high frequency connection.

ACCESSORIES

REF.	DESCRIPTION	QTY
5111000	High frequency coil	1
5111005	Large red mushroom glass electrode	1
5111047	Small purple mushroom glass electrode	1
5111006	Pencil glass electrode	1
5111010	Glass electrode for the neck	1
5111014	Indirect aluminium electrode	1
5111095	Indirect spiral glass electrode	1
210054	Mains cable with ferrite	1

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HIGH FREQUENCY

The **high frequency** unit corresponds to the third window of HF 5000. In the photo above are shown the accessories corresponding to this application (3).

HIGH FREQUENCY MODULE

High frequency is a variable alternating current with an approximate voltage of 30.000 to 40.000 volts and a frequency of 150 to 200 kilocycles. As it is found at very high frequencies, this current is not capable of producing muscular excitation, since to obtain a muscular contraction the wave needs to last besides having a certain intensity.

Thermal effect

The thermal effect is produced by the passage of an electric arc from the electrode to the person treated, leaving a certain amount of energy on the skin in the form of heat. This rise of temperature, although not very high, is capable of acting on the biological reactions by increasing them as well as the cellular oxygenation and eliminating carbon dioxide.

Peripheral vasodilator effect

A pronounced effect of these currents is the stimulation of the peripheral blood flow. The peripheral action of the high frequency produces a slight reddening of the skin.

Antibacterial effect

Another important, clearly-demonstrated effect of high frequency is the antibacterial action of these currents, as well as that of weakening the activity of the bacterial toxins. This is mainly due to the formation of ozone. The spark or arc light that passes from the electrode to the skin crosses the small layer of air that separates them, producing the physical phenomenon of converting atmospheric oxygen into ozone. This gas is very unstable and reacts rapidly with different compounds, causing an oxidation that explains its germicide and antiseptic properties.

High frequency accessories

The accessories of a high frequency apparatus are glass or quartz electrodes with diverse shapes and applications. When the current goes through the electrodes, it lights up inside with an orange light if it is made of NEON or blue if it is of VIOLET.

As the multiple qualities of high frequency currents are known, we are not going to show here more than a few of the many treatments that can be performed and that are the most common.

HIGH FREQUENCY

High frequency is a beauty treatment that both beauticians and clients either love or hate, because without reasonable care it is easy to give yourself or the client small, benign but appreciable electrical shocks.

So why do we use it? Depending on how it is used it can be peripheral, circulatory and soothing, stimulating, astringent or mildly antiseptic.

A high frequency current is basically a very fast alternating current. An alternating current alternating few times every second is a *low frequency* current – for example, the socket that alternates with a frequency of 50 hertz. An alternating current alternating at thousands of hertz is *medium frequency*. Currents of 4000 hertz used in interferential beauty treatments are an example. An alternating current alternating at 100,000 hertz or more (even millions of hertz) is *high frequency*. At these frequencies, these currents have some unusual properties that are used in beauty treatments.

Properties of high frequency

High frequency goes through the body in a very simple manner. Remember that high frequency means *low impedance*. This also means that it easily goes through all types of substances that are normally electrical insulants, and at high voltages the current is very difficult to contain.

This explains the ease with which those small electrical shocks take place.

Body tissues have a high *water* content. Concentrated through the treated area, the *energy* of the high frequency current is absorbed by the *water molecules*, stimulating and making them vibrate and heat up. High frequency increases the temperature and *heats* the tissues.

An unusual but very useful effect of high frequency current is that it passes along a conductor like a wire or metallic bar to its end. Then its energy passes cleanly until the end of the conductor to be *transmitted* as *radio waves*. Any radio, television or radar transmitter depends on this effect. The frequencies used in the beauty treatment appliance must not cause undue interferences in radio and television receivers.

Located near another conductor such as a piece of metal or the body but *not* touching, high frequency will skip the space between the two elements with a *sparkle*. It is this sparkle which produces the stimulation and asepsia effects during the beauty treatment. These sparkles can create slight electrical shocks if not enough attention is paid.

High frequency in the beauty treatment

Two types of high frequency are used for their aesthetic effects. One is a high frequency current of lesser frequency and *high voltage* (this is not really a contradiction). This current is produced by the high frequency appliances of beauty salons and by the beauty treatment appliances. The frequency is around 100,000 to 250,000 hertz and, if it is transmitted from the electrodes, is radiated as *long wave* radio waves.

The other one is a current of greater frequency, lower voltage used for epilation, the permanent elimination of unwanted hair. Its frequency is usually 27,150,000 hertz (or 27.12 megahertz).

When it is transmitted through the epilation needle it is radiated as *short wave* radio waves. This system of epilation is called "*epilation by short wave*".

High frequency current

The outlet of the high frequency current is an alternating current of high frequency (100,000 to 250,000 hertz) but of fairly low power, so the flow of the current is very low.

Applying high frequency to the client

High frequency appliances in aesthetics transmit high frequency energy to the client using a *single* electrode. Fairly unusual for electrical currents, it does not need two connections to complete a circuit. The energy of high frequency is *in contact* with the ground or dispersed within the client's body. The effects of the current are concentrated around the contact point of the electrode and, for this

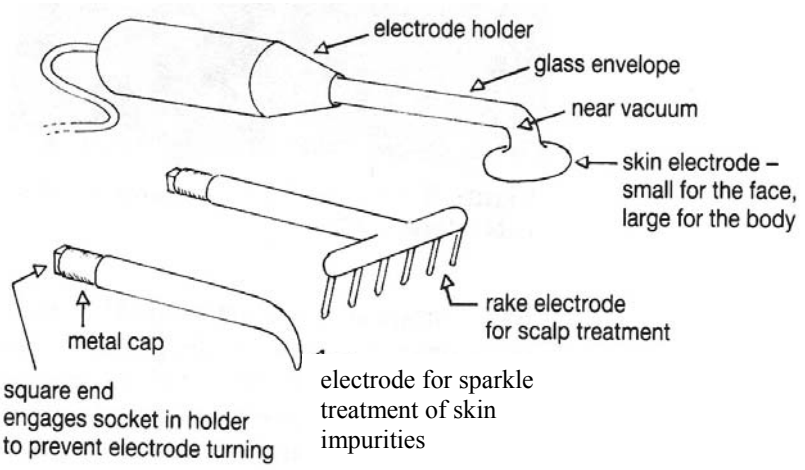
reason, can only be *superficial*. The special electrodes necessary are those described below.

Physiotherapists require much more often a *heating effect* much deeper from their *diathermia* appliances by high frequency. They normally have two electrodes located in both arms, both sides of the area to treat, and high frequency is introduced through the human tissues situated between them in the form of radiowaves. Alternatively, there can be a cable of extremely flexible cord that can also be applied to the treatment area.

Electrodes used in aesthetics

A variety of *glass* electrodes are used for the beauty treatment with high frequency. For the majority of the treatments, a metal electrode could dangerously shower the clients with sparks.

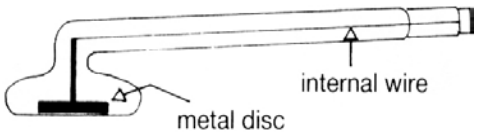
Glass electrodes are objects of closed surface that have been given specific shapes to cover each treatment. There is a *void* inside them. High frequency is introduced through the metallic terminal that *must be inserted* by pressure in the electrode holder handle.



High frequency energy causes the *ionisation* of some of the atoms of the little quantity of air inside the electrode. In ionization, some electrons are expelled from the atoms, converting them into charged *ions*. The current then flows easily across the tube until the contact point with the skin, making these ions vibrate. The ions, however, soon recover their electrons and return energy by transmitting it in the form of light and ultraviolet radiation. Electrodes with *air* produce a violet gleam. They are called MacIntyre *violet radiation tubes*.

Some electrodes contain a bit of mercury vapour and shine with a blue colour. Some contain neon and shine with an orange colour. As they are made of glass, the ultraviolet produced cannot escape. But be careful: some electrodes made of *quartz* let fairly high doses of these ultraviolet radiation escape. Electrodes made of quartz are not differentiated from the glass ones at a simple glance and are not available through suppliers of beauty salons. They must not be used for beauty treatments.

Intensifying electrode

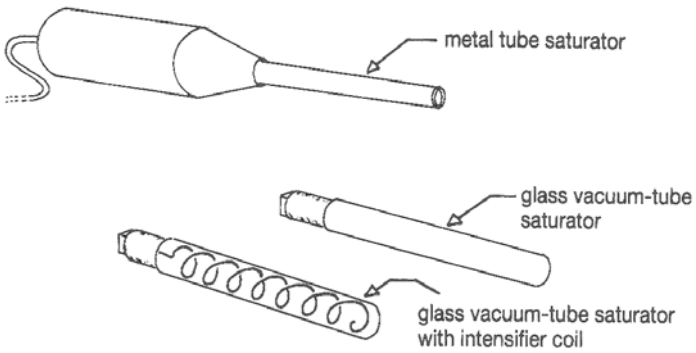


Intensifying electrode

In order to improve the efficiency of the transmission of high frequency energy to the skin, the intensifying electrode has an internal wire that connects the contact terminal with a metallic disc located inside the glass where the electrode touches the skin. This means that more energy succeeds in getting to the skin.

Saturating electrode

In the *indirect* method of high frequency application, the client is charged with high frequency energy by fixing a saturating electrode while the beautician manually massages the treatment area. Various types of saturating electrodes are available. The most simple is a *tube* or *metallic bar* that fits inside the electrode holder handle. This electrode can give unpleasant sparks in the hands if not firmly held by the client. A cylindrical glass electrode is much more comfortable to use. An *intensifier* with a metal spiral inside can also be used.



Direct application of high frequency

High frequency treatment can be used in the client in two different ways: method of *direct application* and of *indirect application*.

In the *direct method*, the beauty professional fixes the electrode in contact with the treatment area and moves it gently over the surface of the skin. The electrode *discharges* its high frequency energy in the skin on the point of contact. Besides this *heating effect*, the *stimulating effects* of sparking take place between the electrode and the skin. The superior and predominant effect of direct high frequency is that of an *increase of stimulating temperature*.

In the indirect method, the client holds the *saturating electrode*. To prevent the wear and suffering of the electrode, the client must hold the electrode-holder handle with one hand and the electrode with the other. He/she is therefore charged with high frequency energy. The beauty professional then gently massages the client and high frequency is discharged from the client towards the fingers of the beautician in contact, concentrating the energy – the heat – in that area. There is little sparking, and therefore little stimulation.

Summarizing:

- The application of *direct* high frequency produces an *rise of temperature* and is *stimulating*.
- The application of *indirect* high frequency produces a *rise of temperature* and is *soothing*.

Effects of high frequency

The reactions of the body to high frequency treatments are responsible for the *heating* and, when there is a direct application, for the responses to *sparking*. In a way, both types of response are in *conflict*.

Effects of heating

The rise in temperature diminishes the responses of the periphereal nervous system. This way, a *soothing* effect is produced. The heating produces the dilatation of the blood vessels, increasing the flow of fluids through the area to disperse the heat. This will increase the biological reactions and the recovery time of the damaged tissues. In the areas of the body with *greater fat accumulation* such as the breasts, it can stimulate the accumulation of fat. However, those using this treatment as a system to add centimetres in this area are soon disappointed with the results, or the absence of them.

The heating produces, however, an increase of sweating and of the sebaceous secretion that contributes to the deep cleansing of the skin in the area and can be beneficial for dry skins.

Physical effects of sparking

We will now consider the conflicting effects of the sparking that accompanies the *direct* method. These effects are dual: the first is due to the *stimulation* and the second is due to the *antiseptic* effect.

A tickling effect is felt when the sparks activate the nerve endings in the skin. This *stimulates* the sensations of the skin. It also has an *astringent* effect, firming the skin and closing the pores to reduce the secretion of fat. Direct high frequency helps drying greasy skin and improves its texture.

The *antiseptic action* of high frequency sparking of has three aspects, for which, in theory, it should be more effective. The sparkles can burn and kill bacteria in the skin. Sparking produces ultraviolet radiation that kill bacteria. The sparkles *ionize* oxygen from the air forming ozone that also kill bacteria.

Oxygen (O_2) is converted into ozone (O_3).

Ozone is unstable and soon disintegrates:

Ozone (O_3) $\Rightarrow$ Oxygen (O_2) and oxygen (O)

Oxygen atoms, called *rising oxygen* or *active oxygen*, are powerful oxidants and are lethal for microorganisms.

This treatment is characterised by the strong smell of ozone that accompanies the high frequency treatment.

Skins that can benefit from high frequency

The effect of direct high frequency treatment is very valuable in *greasy skins*, where its astringent action reduces the fat secretion and its antiseptic action reduces the presence of blackheads and other skin impurities. It is also said that it is valuable in skins that tend to *age*, where the stimulating action of the astringent firms, but very temporarily. It is also useful in skins with a problematic tendency for its antiseptic action and for its ability to "burn" blackheads.

Drying these impurities can be achieved by the elevation and angulation of the facial electrode over the blackhead in order to produce a shower of sparks, or also by using a long and narrow **electrode** especially conceived for impurities.

Precautions and contraindications

Contraindications of high frequency are almost non-existent. From this point of view, the treatment is completely *harmless*. But little accidental *shocks* that can bother the anxious client are easily produced.

First you must fully explain what the client will *feel* and particularly the *sparking*. The treatment can frighten a client who does not know what to expect.

Then make sure that the client does not touch any nearby element. Make absolutely sure that the hands are not close to the metallic edge of the seat or bed, otherwise the current will pass to the ground from him across the metal. Similarly, it is also a good idea to remove any metallic object of jewellery, particularly those that can be held freely over the clothes. Elements adapting to the skin in a compressive way like wedding rings must be removed.

When the treatment begins, do not connect the machine until the electrode enters in contact with the skin, or place your finger over the glass until it comes into contact with the skin, which can also reduce the initial electrical shock. Likewise, at the end of the treatment, disconnect the appliance or put the finger on the glass again before lifting the electrode. This is done to avoid sparks between the void of the electrode and the skin. COMPACT 500 includes electrode-holders with a button in the handle to produce current only produced when that switch is activated.

Do not use high frequency on skin recently sprayed with lotions of alcohol or sulphur base lest it would produce fire in the client's skin.

Beauty professionals normally complain that they receive many electrical shocks from their high frequency equipments and ask themselves what mistake they have made. The answer is as simple as thinking that the glass electrode has been contaminated with the skin cream or by talcum powder and that the current is dragged with these remainings throughout the machine. You can appreciate how a film of moiturising cream can conduct high frequency, but it is hard to believe that the talcum powder does it too. The solution is to clean the machine and the electrode-holder handle with a cloth moistened with alcohol, without forgetting to clean the connector in which the electrodes are introduced.

BEAUTY TREATMENTS THAT CAN BE CARRIED OUT

1.- Beauty treatment of blackheads and skin impurities

It is a relatively slow treatment, for which a great consistency from the client is necessary in the continuity of the treatment. As the impurities of the cutis are produced periodically (normally, every beginning of winter) it is convenient to begin the treatment when these impurities (red and white spots, blackheads) have not yet excessively developped since they resist less at that stage.

This treatment consists of the known sparking or distance application. The smooth electrode is used. The intensity must be low. Even so and due to the tickling produced by the shower of sparks produced, the client may be somewhat nervous. To reduce this tickling and relax the client, place a folded tissue (never fibre cloth) between the electrode and the cutis. The duration of the session must not exceed three minutes in any case. During the development of the treatment the classic smell of ozone can be detected, produced by the shower of sparks. Thanks to this treatment the blood flow is improved and disinfected due to the action of the ozone.

2.- Beauty treatment of wrinkles, eye bags, crow's feet, etc.

Two different techniques can be used for these treatments: the first is carried out with the smooth electrode through direct application and the second is carried out with the metallic electrode through indirect application.

With the first one, gently and slowly slide the electrode on the client's cutis always with an up and down movement. In both start with a low intensity.

Another type of treatment is that which is performed with the pencil-shaped glass electrode. This electrode is used to carry out fulgurations.

3. Beauty treatment of dandruff and hair loss

High frequency has an important microbicidal action due to the ozone that it produces. But besides it generates a vitalizing action on the cells of the dermis and epidermis thanks to its great power of penetration and improvement of the blood flow. These two actions are combined to revitalize the scalp. For the treatment of dandruff and hair loss, the comb-shaped glass electrode is used. The intensity must be somewhat higher than in other treatments but the application time must not last more than three minutes.

4. Other applications of high frequency.

High frequency can also be used to fight blackheads. It is also advisable to apply this shower of sparks after a depilation, since it helps to reduce the irritation produced on disinfecting the epidermis thanks to the action of the ozone.

START UP

1. Check that the equipment is connected.
2. Activate the on switch (2).
3. Insert the extremity into a plug in the high frequency outlet (4) on the front of the machine.
4. Hold the electrode-holder handle in your hand, taking it out of its support, and introduce in it the the electrode that we are going to use until it is well held. Observe that there is an on switch on the high frequency handle.
5. Turn the potentiometer (3) to the right and select the appropriate intensity according to the type of treatment and the client's sensitivity.
6. Activate the electrode holder handle. Be sure to press the on switch of the same electrode holder handle to give the order of movement to the current. This switch is very useful to stop the treatment once the session is finished independently from the machine. The electrode will light up and the high frequency appliance will be activated. When using the metallic electrode, it is VERY IMPORTANT that the beautician asks the client to hold it in their hand BEFORE turning the high frequency module on.

7. At the end of the treatment, lower the power and disconnect the module through the regulation potentiometre (3), turning it to the left. If we have used the metallic electrode, it is now and NOT BEFORE that the client must release it.
8. Remove the electrode from the handle and place it in its corresponding place with the electrode holder handle.
9. Turn off the on switch (2).

IMPORTANT

The following points must be observed for any treatment:

- Hold the electrode-holder handle the furthest possible from the current-transmitting orifice.
- The application time of high frequency recomendable per session is between 5 and 7 minutes.
- Do not touch sensitive areas with the electrodes (lips, nipples etc.)
- Touch the end of the electrode with a finger both when approaching the electrode towards the client and withdrawing it. The beautician will have to enter in contact with the part furthest from the base of the glass to avoid the client startling with the unexpected sensation of the harmless shower of sparks that he or she will receive at that time.
- Apply the high frequency preferably after the vapourization of ozone and before the face mask. It is considered to be the ideal moment.

POSSIBLE TECHNICAL PROBLEMS

1. The machine is not working. Why?

The cable of the accessories may be cut in one of its points or at the extremity of connexion to the machine. For a proper operation of the machine, replace the broken part of the cable. The equipment blocks any current output when it detects a leak. To extend the lifetime of these accessories, it is recommended to place the apparatus at a 90º angle from the working couch, to avoid any unnecessary suffering of the cables.

Also check that the plug is connected properly and that tension reaches the appliance (you can check the presence of current with another equipment). Verify the rear connector and the reliability of the mains cable, using it to connect another appliance. It thus indicates that the problem does not come form the mains cable. Once these verifications are made, the protection fuse may be examined to see if it has not meted. Finally, make sure that the mains voltage corresponds to that of the equipment.

If the pilot light is on but the machine is not working, check with this start up manual that the operation process is the right one. If the problem persists, consult the technical department.

90% OF TECHNICAL PROBLEMS COME FROM A LACK OF ATTENTION WHEN HANDLING THE BUTTONS AND FROM THE NATURAL WEAR OF THE ACCESSORIES. For this reason, please check all these details before contacting your nearest technical service.

2. I discovered that the equipment does not work properly since yesterday. However, there has been a storm...

Storms and rains can sometimes affect national hydroelectric systems. If you discover problems with your electrical equipments after a storm (especially the most sensitive), it is advised to connect a current stabiliser to the machine. This electrical device facilitates the apparatus proper operation by purifying the inconstant electrical signal received by the user and creating a continuous, stable signal. Sensitive equipments can then work properly since they receive the same amount of mains voltage at all time.

GUARANTEE AND SAFETY

1. The manufacturer is not responsible for an improper use of this machine, nor for the consequences derived from it. Any use not included in this instruction manual can be dangerous. We therefore ask you to consult your nearest authorised distribution centre for any doubt.

2. Our wish to include possible improvements in our appliances compel us to reserve the right to modify the characteristics of our equipments without prior notice.

3. All equipments are provided for a **mains voltage** of 230 volts. If you require a voltage of 125V, notify it to your provider at the time of the order.

4. As MANUFACTURERS we offer a 24-month **guarantee** on our equipments against any manufacturing fault.

   In order for this guarantee to be efficient, the following technical **specifications** must be taken into account:

   4.1. Minimum specifications in the electrical installation:

   - The equipment must always be connected to the electrical current by means of a voltage regulator with ground point, whose output voltage must be included between 110 and 120 volts, in the case of installations with this voltage (particularly in Latin-American countries) or 220 and 230 volts in European countries.

   - The socket where the equipment is connected must be in perfect conditions.

   4.2. This guarantee **becomes invalid** if:

A. The equipment is used **improperly**.
B. The electrical installation or the regulator connected to the equipment are **defective**.
C. The equipment is exposed to **overloads**, short-circuits, electrical discharges, floods or other similar unforeseeable circumstances.
D. The equipment is **handled** or **repaired** by staff non authorised by EMA.

DECLARACIÓN DE CONFORMIDAD

DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITÉ
89/336/CEE
73/23/CEE

MARZO 2003
MARCH 2003
MARS 2003

Electroestética & Mobiliario

CE

***Nombre del Fabricante*:** **BIOINSIDE INVESTIGACIÓN Y TECNOLOGÍA, S.L.**
Manufacturer's name:
Nom du fabricant :

Dirección del Fabricante:
Manufacturer's address:
Adresse du fabricant :

Sant Martí de l´Erm, 22
E 08970 – Sant Joan Despí
BARCELONA - SPAIN

Declara que el producto:
Declares that the product:
Déclare que le produit :

Electrocosmético
Electrocosmetic
Electro-cosmétique

Nombre del producto:
Name of the product:
Nom du produit :

HF 5000

Marca:
Brand:
Marque :

EMA

Cumple con la normativa:
Complies with the norm:
Est conforme à la norme :

Seguridad Eléctrica:
Electrical Security:
Sécurité électrique :

CLASS I TYPE BF
UNE EN 60601

Compatibilidad Electromagnética:
Electromagnetic Compatibility:
Compatibilité électromagnétique :

EN 61000-3-2, EN 61000-3-3, EN 50081-1, EN 55011, EN-5002-1, EN 61000-4-2, EN 61000-4-2, EN 61000-4-3 + ENV 50204, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11.

Signed: Pilar Sánchez

MANUFACTURER'S NOTE:

Our wish to offer to the aesthetic sector equipments that keep adapting to the requirements of this young profession leads us to conceive new equipments and to try and improve those already existing. For this reason we are compelled to reserve the right to modify these specifications without prior notice.

All equipments are intended for a mains voltage of 230 V. If you require it for a voltage of 125 V, please inform your supplier at the time of order.

The inappropriate use – not included in this instruction manual – from the beauty professional can have undesirable results. The manufacturer is not responsible for the results derived from an improper use of the machine.

SUGGESTIONS:

Your opinion is important to us. You can send your comments and suggestions to get a better service day after day. You can write at the following address:

EMA

BIOINSIDE INVESTIGACIÓN Y TECNOLOGÍA, S.L.
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NOTES AND COMMENTS

EMA

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