FCC Frequency Interference Statement

Warning:
This equipment generates and uses radio frequency energy, and if not installed and operated in strict accordance with the manufacturer’s instructions, may cause radio frequency interference.

Notice 1:
This equipment has been verified to comply with the specifications in Part 18 of FCC Rules, which are designed to provide reasonable protection against radio frequency interference. However, there is no guarantee that interference will not occur in a particular installation.

Notice 2:
If this equipment is found to be the source of radio frequency interference, which can be determined by turning the equipment off and on, the user should try to correct the interference by one or more of the following measures:
- Reorient the receiving antenna (as applicable).
- Relocate the Auto*Therm with respect to the receiver.
- Move the Auto*Therm away from the receiver.
- Plug the Auto*Therm into a different outlet than the receiver.
- If necessary, the user should consult with the dealer or manufacturer for additional suggestions. (The user may find FCC’s “Interference Handbook” helpful. It is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004–000–00450–7.)

Notice 3:
The manufacturer is not responsible for any interference caused by unauthorized modification to this equipment.

Mettler Electronics Corp.
1333 S. Claudina St.
Anaheim, CA 92805
Toll Free: (800) 854–9305
Or (714) 533–2221
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1 Introduction

1.1 Introduction to the Auto*Therm® 395
Thank you for purchasing the Auto*Therm 395 shortwave diathermy. This unit features up to eight different applicators which include two inductive coil applicators, one flexible inductive coil applicator, three condenser plate applicators and two soft rubber electrodes. Multi-jointed arms firmly support the applicators during treatment. Large knobs lock and unlock the joints to make positioning the applicators to the patient quick, easy and secure. Shortwave diathermy may be applied using continuous or pulsed modes using all eight applicators.

An easy-to-use membrane panel guides the user through setup. A large control knob is provided to increase and decrease intensity. A pull-cord allows the patient to stop all output if the treatment becomes uncomfortable. Large locking wheels allow the Auto*Therm 395 to be moved easily around the clinic and then locked in place when needed.

The Auto*Therm 395 has been certified by TÜV Rheinland Product Safety GmbH, Berlin to meet the following safety standards:
- EN60601-1:1990 +A1+A2+A13
- IEC60601-2-3:1993+A1

In addition, the Auto*Therm 395 meets the following standards for radio frequency emissions:
- FCC Part 15–B
- EN60601-1-2:1993
- EN–55011 (CISPR–11)

Mettler Electronics Corp. has been certified by VTT Expert Services LTD to be compliant with EN ISO 13485:2003 and MDD 93/42/EEC Annex II requirements. In addition, Mettler is certified by DQS Medizinprodukte GMBH to be compliant with ISO 13485:2003 (CMDCAS) Canadian Medical Device requirements.
1.2 Introduction to This Manual
Read the contents of this manual before treating patients with the Auto*Therm 395.

This manual has been written to assist you with the safe operation of the Auto*Therm 395. It is intended for use by the owners and operators of the Auto*Therm 395. The goal of this manual is to direct the correct operation and maintenance of this unit.

The specifications and instructions presented in this manual are in effect at the time of its publication. These instructions may be updated at any time at the discretion of the manufacturer.

1.3 Safety Precautions
The Auto*Therm 395 operates with high voltages. Qualified biomedical technicians with training in service of shortwave diathermy equipment should perform servicing of the Auto*Therm 395 or it should be returned directly to the factory. To maximize safety during use, the unit should be plugged into a grounded wall outlet. General safety guidelines for medical electronic equipment should be followed.

Service may be obtained from the manufacturer by sending the Auto*Therm 395 in its original shipping container to Mettler Electronics Corp., 1333 South Claudina Street, Anaheim, CA 92805, ATTN: Service Department. (Telephone toll free: (800) 854–9305, Alternate telephone number: 1 (714) 533–2221) NOTE: All warranty repairs must be performed by Mettler Electronics Corp. or by a service facility authorized by Mettler Electronics to perform warranty repair work.

A service manual for the Auto*Therm 395 is available from Mettler Electronics Corp. for a nominal charge.

1.4 Caution
Federal law restricts the sale of this device to, or on the order of a physician, dentist, veterinarian or any other practitioner licensed by law of the state in which he practices.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure to radio frequency energy. Treatment should be administered only under the direct supervision of a health care professional.

1.5 Shipping Damage
Your new Auto*Therm 395 is shipped complete in one or more cartons. Upon receipt, please inspect the cartons and the unit and its accessories for visible and hidden damage. If you discover any damage, hold all shipping materials, including the carton, and call the shipping agent who delivered the unit. They are responsible for all damage in transit; therefore, all claims should be filed directly with them. The factory will not be responsible for any damage in shipment, nor allow any adjustments unless proper formal claim has been filed by the receiver against the carrier.

The carton in which your new Auto*Therm 395 was received is specially designed to protect the unit during shipping. Please retain all shipping materials in the event that you will need to return your unit for servicing. NOTE: All warranty repairs are to be performed by Mettler Electronics Corp. or an authorized Mettler Electronics warranty repair center.

1.6 Package Contents
Your new Auto*Therm 395 comes complete with all the necessary components to perform shortwave diathermy. Below is a list of items that are included in the shipping carton. Another carton includes your choice of the necessary components for inductive drum or capacitive plate shortwave diathermy applications.

1. Auto*Therm 395
2. Detachable line cord.
3. Instruction Manual and Warranty Card
1.7 Limited Warranty

The Auto•Therm 395 shortwave diathermy unit and its accessories are warranted against defects in materials and workmanship for a period of one year from date of purchase. During the applicable warranty period Mettler Electronics Corp. will, at its discretion, either repair or replace the Product without charge for these types of defects.

For service under this warranty, the Product must be returned by the buyer within the applicable warranty period to Mettler Electronics Corp. **Shipping charges to Mettler Electronics Corp. under this warranty must be paid by the buyer.** The buyer must also include a copy of the sales receipt or other proof of the date of purchase. If the Product is returned without proof of the date of purchase, it will be serviced as an out-of-warranty product at Mettler Electronics Corp.'s prevailing service rates.

Alteration, misuse, or neglect of the Product voids this warranty. Except as specifically set forth above, Mettler Electronics Corp. makes no warranties, express or implied, including without limitation any implied warranty of merchantability or fitness for a particular purpose, with respect to the Product. If any implied warranties apply as a matter of law, they are limited in duration to one year.

Mettler Electronics Corp. shall not be liable for any indirect, special, consequential or incidental damages resulting from any defect in or use of the Product.

Any legal action brought by the buyer relating to this warranty must be commenced within one year from the date any claim arises and must be brought only in the state or federal courts located in Orange County, California.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to the buyer. This warranty gives the buyer specific legal rights, and the buyer may also have other rights which vary from state to state.
2 Symbol Glossary and List of Abbreviations

2.1 Operational controls, displays, receptacles and symbols

Auto•Therm 395 membrane panel controls

Auto•Therm 395 applicator arm assembly
Auto-Therm 395—controls and receptacles located on the back of the unit

(1) Power switch with indicator light
(2) RESET Selector
(3) Continuous mode selector
(4) Pulsed mode, 70 Hz / 2 ms selector
(5) Pulsed mode, 350 Hz / 0.4 ms selector
(6) 8 cm diameter inductive coil applicator selector
(7) 14 cm diameter inductive coil applicator selector
(8) 15 cm x 35 cm (Triplode) inductive coil applicator selector
(9) 4.2 cm diameter condenser applicator and 8 x 14 cm flexible condenser applicator selector
(10) 8.5 cm diameter condenser applicator and 12 x 18 cm flexible condenser applicator selector
(11) 13 cm diameter condenser applicator selector
(12) Decrease treatment time selector
(13) Increase treatment time selector
(14) Treatment time display in minutes
(15) Intensity display

(16) Patient coupling display bar graph

(17) Intensity control knob

(18) Slide for attaching the applicators

(19) Applicator holder

(20) Hinge

(21; 23) Lock knobs for arm hinges

(24) Lower part of arm

(25) Lower rotating hinge

(26) Lock knob for vertical movement

(27) Clasp for fastening arm to cabinet

(30) Socket for inductive coil applicators

(31) Sockets for condenser applicators

(33) Mains power connection

(34) Emergency-OFF switch (ripcord)

(35) Screw holes for arm attachment

Attention, consult instruction manual.

Non–ionizing radiation

Type BF Equipment—Class I

Year of manufacture

2001
3 General information

3.1 Shortwave diathermy applications
The Auto-Therm® 395 is a shortwave diathermy device that operates at 27.12 MHz. It provides traditional shortwave diathermy therapy using condenser and electromagnetic inductive coil fields in both continuous and pulsed modes of operation. Therefore, it is suited for all diathermy treatments in both the clinic and the medical practice.

The use of shortwave diathermy for heat therapy has the advantage of penetrating deeper than other conventional methods, such as hot packs, infrared lights and heat pillows, and even microwave diathermy.

The heat generated by shortwave diathermy induces a whole range of physiological effects. It relaxes muscles, tendons and other connective tissues, and increases blood circulation in the treatment area.

When shortwave diathermy is applied in short, high-energy pulses the depth of penetration is increased, having a particularly positive effect on the blood circulation, while the temperature sensitive skin hardly feels the heat.

Shortwave diathermy can be applied over a large area of the skin’s surface.

3.2 Unit description
The Auto-Therm 395 has four wheels for easy transportation between treatment rooms. Two of these wheels have brakes that can be locked to prevent movement during use.

The membrane control panel is mounted on the top of the unit. It is easily cleaned and contains all the controls and displays for operating the Auto-Therm 395.

The intensity control knob (17) adjusts the output power via an encoder. The power switch (1) (ON/OFF) is on the upper left side of the unit. Screw holes for attaching the arms are located on the rear of the unit (35). The sockets for connecting the cables for the condenser (31) and inductive coil (30) applicators and the detachable mains power supply cable (33) including fuses are also located on the back of the unit. The ripcord (34) for the patient emergency-OFF switch passes through a bushing mounted on the back of the unit so that it can be pulled from all directions.

3.3 Arms
The arms are mounted at the rear of the appliance (35) by means of keyhole type connectors (27). Both arms must be installed to use the condenser applicators that must be used in pairs. The inductive coil applicators require only one arm to be installed. Both arms can be attached to the device so that you can change applicators at will. The clinician can safely position the applicators in widely differing treatment positions because the arm has five locking joints. The arms are made of high quality flame-resistant plastic material so that they can be used to guide and hold the applicator cables in order to avoid inadvertent contact between patient and cables.

Refer to the illustration of the arm assembly on page 5 for all the following instructions. With the exception of the horizontal swing of arm and hinge (20) of the applicator holder (19), all hinges can be adjusted by the user as the treatment demands.

The lock knob (26) on the lower rotating hinge (25) locks the whole arm in position, even when the arm is maximally extended. The other main hinges (21; 23) that control the length and height of the arm can be adjusted after the appropriate knobs have been loosened. To do this, it is practical to support the arm above the hinge that has been loosened (20) or (21).

The shaft of condenser or inductive coil applicators is inserted into the aperture of applicator holder (19) until the slide (18) snaps shut.
When using an inductive coil applicator with a fixed connection cable, feed the cable through the aperture first before attaching the applicator. Remove the applicator by pushing back the slide (18) and pulling the applicator out of the holder. The central joint of the arm (23) is factory-adjusted to a basic braking force. After long-term application, it may be necessary to readjust the basic braking force due to wearing of plastic parts and brake disks. To adjust this joint, remove the blue cover using a screwdriver and tighten the hexagonal bolt located below the cover by about a half turn.

Adjust the breaking of the horizontal motion of the arm at the joint (25) by tightening the lower slotted nut.

3.4 Applicators and applicator cables
Inductive coil as well as condenser applicators may be used with the Auto-Therm 395 (see Section 8, Accessories).

3.4.1 Condenser applicators (spaced applicators)
Three pairs of different diameters are available. The optimum ratio of the fixed electrode-to-skin distance (measured from the outside of the applicator casing to the inner electrode plate) and the corresponding electrode area is characteristic for applicators used with the Auto-Therm 395. This results in low-loss transmission of the high frequency energy from the generator via applicator to the patient (for further information see 5.4, 5.5 and 5.6).

3.4.2 Flexible condenser applicators
These applicators are available in two different-sized pairs. The permanently attached, highly flexible cable ensures maximum flexibility at the point of applicator connection and high adaptability to bent or curved parts of the patient's body. The optimum distance between the applicator and the skin is achieved by using thick felt spacers that have to be placed in a cloth bag together with the applicator.

One to three of the 5 mm thick felt spacers are used for tuning between electrode and skin. The number of spacers depends on the application and characteristics of the tissue. Velcro fasteners or rubber bands may be used for fastening these applicators.

3.4.3 Inductive coil applicators
Three different sizes of the inductive coil applicators are available to adjust to the size and volume of different treatment areas (for further information see 5.4 and 5.5).

This inductive coil applicator uses the high frequency magnetic field generated by the inductive coil of an electrical resonant circuit for therapy. All inductive coil applicators of the Auto-Therm 395 are electrically shielded and connected to the unit via removable, shielded cables.

This means, electric interference of nearby devices (neuromuscular stimulators, etc.) is avoided as much as possible. Additionally, the removable shielded cables are fitted with a special EMC filter to suppress harmonic interferences.

3.4.4 Applicator connection cables for condenser applicators
Highly flexible, low-loss special cables (29) are used to connect the condenser applicators to the unit. A hooked connector is provided to prevent damage or kinking of the cable in the applicator connection area. Electrically superior, flame-resistant silicone insulating materials have been used to avoid cable defects and help prevent problems when used incorrectly (e.g. in case the cables touch each other). Patients should not touch the cables during treatment to avoid undesired heat application. Therefore, any extra cable should be fed through the lower arm (24) to secure it. If necessary, insulate the patient from the cables by placing several layers of towelling between the patient and the cables.
3.5 Cleaning and disinfecting
Turn off the unit and unplug it from the mains power supply before cleaning or disinfecting it. Clean and disinfect the unit and its accessories (except for the felt spacers) with commercially available surface disinfectants.

To prevent damage to the surface materials of the Auto•Therm 395, use only surface disinfectants based on agents like aldehydes, alcohol or ammonium compounds that are suitable for wipe and spray disinfection. Use them according to their instructions for use and duration of action.

To prevent possible material damage, avoid the use of products based on halogen-splitting compounds, strong organic acids and oxygen-splitting compounds, solvents, benzene and similar agents.

ATTENTION:
Do not allow any liquids to penetrate the unit or its accessories while cleaning and disinfecting. Dry all sockets and connectors that have become wet before any further use!

ATTENTION:
The Auto•Therm 395 generates high frequency electric and magnetic fields that can penetrate walls, ceilings and floors. It cannot be prevented that components of these fields exist in the vicinity of the device. Sensitive electronic instruments, that are in the immediate vicinity of the Auto•Therm 395, can be adversely affected by these fields. This danger largely depends on the distance between the devices. Therefore, the Auto•Therm 395 must not be installed any closer than 5 meters from other sensitive devices, if possible farther. The applicators should never be applied to sensitive devices, e.g. neuromuscular electrical stimulators or their electrodes or cables.

This problem can be completely eliminated when the Auto•Therm 395 is installed in a shielded room, i.e. one containing a Faraday cage. (A Faraday cage is enclosed by a metal housing or grid that prevents the penetration of electric fields.)

Use of absorbing curtains is enough for most treatment rooms.

We recommend that operators and other persons keep a distance of at least 2 meters to applicators and cables while they are in use. In case of doubt, it is recommended to measure the field strength. Pregnant women must not operate the appliance.
4 Indications, Contraindications and Precautions for Shortwave Diathermy

4.1 Indications
Shortwave diathermy delivers energy in the radio band of 27.12 MHz to provide deep heating therapeutic effects to body tissues. When shortwave diathermy is delivered to the body at intensities capable of generating a deep tissue temperature increase, it can be used to treat selected medical conditions such as:
1. Relieving pain
2. Reducing muscle spasm
3. Increasing range of motion of contracted joints using heat and stretch techniques.
4. Increasing blood flow to tissues in the treatment area.

4.2 Contraindications
1. Diathermy must not be applied over areas of the body which may contain metal (implants, surgical staples, etc.) for heat will become concentrated in that area increasing the possibility of tissue damage and deep burns.
2. Any patient with an implanted electronic device such as a cardiac pacemaker, bladder stimulator, spinal cord stimulator or electrodes for a myoelectric prosthesis, or implanted metallic leads, must not be treated with shortwave diathermy and should not be in the vicinity of the Auto*Therm® 395 when it is in operation.
3. Do not treat on a metal treatment table, mattress with metal springs, wheel chair or a metal stool. Make sure that the patient cannot come into any contact with metal during treatment.
4. Remove clothing from the treatment area. Any metal contained in the clothing, such as zippers, bra hooks or rivets may cause burning. In addition remove jewelry and watches during treatment.
5. Remove hearing aids and watches during treatment to prevent interference with or damage to these devices.
6. Do not treat over the pelvic or low back area when an IUD is present.
7. Shortwave diathermy should not be applied over the pregnant or potentially pregnant uterus. Therefore, shortwave diathermy should not be applied over the uterus unless specific assurance can be attained from the patient that she is not pregnant.
8. Shortwave diathermy should not be applied to the eye.
9. Neoplastic tissues or space occupying lesions should not be exposed to shortwave diathermy.
10. Shortwave diathermy should not be applied to the testes to avoid increases in temperature.
11. Do not treat ischemic tissues in individuals with vascular disease where the blood supply would be unable to follow the increase in metabolic demand and tissue necrosis might result.
12. Shortwave diathermy should not be applied over the epiphyseal areas (bone growth centers) of the bones of growing children.

4.3 Precautions
1. Shortwave diathermy should not be applied in areas of reduced sensation or circulation. Patients having reduced sensation will not be able to notify the practitioner of discomfort if the intensities are too high. Patients with compromised circulation may have an excessive heat buildup in the treatment area.
2. Any bleeding tendency is increased by heating because of the increase in blood flow and vascularity of the heated tissues. Care, therefore, should be used in treating patients with therapeutic shortwave diathermy who have bleeding disorders.

3. Heating of the joint capsule in acute or subacute arthritis should be avoided.

4. Use a single layer of toweling to absorb moisture during treatment with the inductive drum applicators.

5. Shortwave diathermy may interfere with other electronic therapeutic devices such as neuromuscular stimulators and therapeutic ultrasound units. Never use another electronic device on the same patient when shortwave diathermy is being applied.

6. Use caution when treating obese patients with capacitive plate electrodes since this method of application may heat fat excessively.
5 Installation & Operation

ATTENTION:
The Auto*Therm 395 is not designed to be operated in environments where there is a danger of explosion. Do not use in anesthesia rooms, where inflammable narcotics are used.

5.1 Mains connection
The standard Auto*Therm 395 must be connected to a mains power of 115 V ± 10 %, 50/60 Hz. However, a special version is also available for the connection to 230 V ± 10 %, 50/60 Hz. (The actual value is shown on the rating plate at the rear of the unit.)

Make sure that the the voltage of the available mains power matches the device before connecting to the mains power supply. Connect the Auto*Therm 395 to a properly grounded socket outlet using the shielded power cord included with the basic accessories.

5.2 Turning the unit on
Switch on the power using the switch (1) on the left side of the unit. The Auto*Therm 395 is now in the stand-by mode of operation. The “Intensity” (15) and “Treatment time” (14) displays are lit. Further settings will be made using the keyboard (figure, page 5).

5.3 Mode of operation
Select the mode of operation using the buttons (3), (4) and (5). Pressing button (3) selects the continuous mode of operation. Different pulsed modes of operation can be selected by pressing buttons (4) or (5). They differ in pulse width and pulse repetition frequency (section 6). The LED indicator will light when a particular mode is selected. The mode of operation can only be selected when intensity display (15) shows “000”.

5.4 Choosing the applicator
Choose the appropriate applicator size dependant upon the area and volume of the body parts to be treated and whether inductive coil or condenser field application is preferred. Press buttons (6), (7), (8) or (9), (10) or (11) of the membrane control panel to indicate the applicator that you intend to use for this treatment. The intensity (output power) will be limited according to the selected applicator to help avoid overheating the treatment area.

The following selectors are assigned to the corresponding applicators:

<table>
<thead>
<tr>
<th>Selector</th>
<th>P/N</th>
<th>Applicator Description</th>
<th>Applicator Illustration</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3955</td>
<td>8 cm diameter inductive coil applicator</td>
<td>![Applicator Illustration]</td>
<td>📃</td>
</tr>
<tr>
<td>7</td>
<td>3956</td>
<td>14 cm diameter inductive coil applicator</td>
<td>![Applicator Illustration]</td>
<td>📃</td>
</tr>
<tr>
<td>8</td>
<td>3958</td>
<td>15 cm x 35 cm (Triplode) inductive coil applicator</td>
<td>![Applicator Illustration]</td>
<td>📃</td>
</tr>
</tbody>
</table>
As mentioned above, any programming is possible only when the intensity display (15) shows “000”.

5.5 Connecting the applicators
The applicators are electrically connected to receptacles (30) or (31).

The coax cable of the inductive coil applicator is connected to receptacle (30). The threaded cap of the plug is screwed onto the receptacle until tight. Plug the pair of condenser cables into their respective receptacles (31) by pushing them in as far as they can go.

Please, plug in only the condenser applicator cables or the inductive coil applicator cable into their receptacle(s) (30) or (31).

Do not plug in all three cables or applicators simultaneously.

5.6 Treatment time
Adjust treatment time by pressing the “+” button (12), to increase time, or the “-” button (13), to decrease time. Selected time is displayed in the time display window (14). Pressing the buttons momentarily will increase or decrease time in 1-minute intervals. Holding the buttons down will change the time in 5-minute intervals. When both buttons are simultaneously pressed the time is reset to “0”.

The maximum treatment time is 30 minutes. You may also change the time during a treatment.

After the time is set, the Auto-Therm 395 starts automatically when the intensity control (17) is turned clockwise. “A” is shown in the time display while the unit is tuning to the patient. After the tuning process is complete, the selected treatment time appears again in the display (14). The remaining treatment time is shown in the time display (14) during the treatment session. When treatment time is complete, an “E” is shown in the intensity display (15), a “0” is shown in the time display (14) and a ten second audible beep is produced. The “E” is replaced by a “0” after one minute to indicate that another treatment may begin at any time.

5.7 Setting the intensity
Position the applicator(s) on the treatment area. Program the settings described in sections 5.3, 5.4 and 5.6. Then, adjust the intensity using intensity control knob (17). If any parameters have not been set, “F E” is shown in the intensity display (15). If “F E” is displayed, turn the intensity control knob to the left to remove the error indication and then complete the setup procedure.

Please note: It is important to place the applicator(s) on the patient with the applicator(s) attached to
the device prior to attempting to adjust the treatment intensity so that the Auto•Therm can properly
tune to the patient’s body.

The intensity control knob (17) can be turned continuously. It has no stops to prevent clockwise or
counterclockwise rotation. Turning to the right increases the intensity in the steps shown below. These
steps apply to both the continuous and pulsed modes of operation.

<table>
<thead>
<tr>
<th>Step</th>
<th>Intensity (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 30 W</td>
<td>3-W steps</td>
</tr>
<tr>
<td>From 30 W to 90 W</td>
<td>5-W steps</td>
</tr>
<tr>
<td>From 90 W to 200 W</td>
<td>10-W steps</td>
</tr>
</tbody>
</table>

The Auto•Therm 395 automatically tunes to the patient when the intensity control knob (17) is turned
clockwise. The tuning symbol “A” appears in the time display (14) instead of time while the device is
tuning to the patient. No changes to any settings can be made while the device is tuning. Press the
“RESET” key (2) or turn the intensity knob (17) counterclockwise to make changes to the setup
parameters during this time. The coupling process is indicated in the coupling LED light bar (16). The
energy transfer to the patient is achieved when all the LEDs are lit (16). You can change the position
of the treatment applicator(s) during the tuning process while the device is tuning to optimize energy
transfer. You can move the applicators when the intensity is low (3 W – 9 W).

When tuning is completed, the treatment time is again shown in the time display (14) and, the actual
output power (intensity) is shown in the intensity display (15). The tuning process can be repeated by
turning intensity knob (17) counterclockwise until the intensity display reads “0” and then turn the
intensity control knob clockwise to start the tuning process over. Once the device is tuned to the
patient, you can increase the intensity to the desired level by turning intensity control knob (17)
clockwise until the desired intensity level is shown in the intensity display (15).

The Auto•Therm 395 continuously monitors the intensity level. If the patient moves, the intensity is
automatically readjusted. When patient coupling to the applicators is not sufficient, the coupling
indicator (16) is only partially lit or off. If there is insufficient coupling, the intensity cannot be adjusted
to the maximum level. The desired intensity (set point) is never exceeded even when coupling
improves. Thus, the patient is protected from any unintended higher power levels as long as the
power adjustment is not changed.

### 5.8 Emergency shut off

The output of the Auto•Therm 395 can be turned off as follows:

- **a)** Turn off power switch (1). (Entire device).
- **b)** Press “RESET” key (2). (The unit is returned to the stand-by mode.)
- **c)** Simultaneously, press the time keys (12) and (13). (The mode of operation and applicator type
remain stored.)
- **d)** Turn intensity knob (17) counterclockwise until “0” appears in the intensity display (15). (The
mode of operation, applicator type and remaining treatment time are kept stored.)
- **e)** End of the adjusted treatment time. (The mode of operation and applicator type remain stored.
Stop the beeper by turning the intensity knob counterclockwise.)
- **f)** The patient can turn the unit off by pulling the ripcord (34). If the patient pulls the ripcord
the unit produces a series of beeps and the code “FEC” appears in the intensity display (15).
Press the “RESET” key (2) in order to return to the standby mode.
5.9 Safety circuit shut off
The microprocessor automatically monitors the circuitry to help ensure the safety of the patient and the Auto-Therm 395. When errors are detected, the output is shut off and an error code is displayed in the intensity display (15). The unit also beeps to indicate an error.

Error messages are indicated by the symbols:

FE2, FE3, FE4, FE6, FE7, FE9, FEA, F Eb, FEC

These error messages indicate problems with the unit or, with “FEC”, emergency stop by the patient pulling the ripcord. If pressing RESET key (2) or turning off and on the unit results in the same error message, service may be required. Error “FE6” may happen with low tuning levels, output levels greater than 130 W or when the patient moves off the electrodes.

The “FE” message means that the parameter settings are incomplete. Eliminate this error message by finishing the setup procedure.
6 Treatment

6.1 Preparing the patient
For optimum therapy, ensure that the patient is in a comfortable and relaxed position. To accomplish this either have the patient in a seated or supine position.

Patients shall never be treated on metal chairs, tables or beds.

For safety reasons, remove all hearing aids, watches, rings, chains, bracelets and other metal objects before starting the treatment. The clinician should also take care to remove metallic objects while operating the Auto-Therm shortwave diathermy.

Do not treat patients through their clothing. Remove clothing from the treatment area. Clothes made of synthetic materials should especially be removed because they insufficiently absorb moisture, allowing moisture to pool on the skin causing local overheating.

Use a single layer of absorbent toweling between the patient and the applicator to absorb any perspiration produced during the treatment and to prevent the development of hot spots due to pooling of perspiration on the skin’s surface.

Hand the ripcord to the patient before starting the treatment so that the patient can shut off the Auto-Therm 395 if any discomfort is felt such as overheating or nausea.

Do not leave children or patients who cannot pull the ripcord, unattended while operating this device.

6.2 Heat effect of the applicators
Evaluating the heat effect of various applicators is based on the the heat felt by the patient. This is strongly influenced by a number of factors, e.g. the thickness of fat layers, treatment through clothes or bandages, blood circulation, temperature of the skin, etc. Therefore, the following sections generally explain the operation of the applicators used with the Auto-Therm 395. The heat effect of the electrodes differs fundamentally between the inductive and capacitive method of application.

6.3 Capacitive method of application
The capacitive method of application transforms the shortwave energy into heat in tissues of low blood circulation (e.g. fat, connective tissues). Thus, tissues near the skin’s surface are heated so that not only the transformed energy but also the distance between applicator and skin is important for the subjective sensation of heat.

For best results place capacitive electrodes parallel to the skin’s surface. This will spread out the energy over the entire treatment area and prevent hot spots. Do not allow these applicator cables to come into contact with the patient. If necessary, insulate the patient from the cables using several layers of towelling.

Depending on the size of the applicator, the condenser applicators of the Auto-Therm 395 are designed for an optimum electrode-to-skin distance. In this way, good distribution of heat in the tissue is ensured by the choice of the appropriate applicator size (section 5.4).

6.4 Inductive method of application
The shortwave magnetic field of an inductive coil applicator generates eddy currents that are transformed to heat in the tissues. These currents increase with increasing electric conductivity of the corresponding tissue region (tissues with good blood circulation, e.g. muscle tissue and inner organs).

To reach these deeper tissues, the inductive coil applicators of the Auto-Therm 395 are provided with an electrostatic shielding that prevents the electric field of the inductive coil applicator from heating the upper-skin fat tissue. Therefore, heat sensation by the patient is basically delayed when using the induction inductive coil applicators. It is recommended to start the treatment with an intensity level below the desired one and increase it later, rather than be guided by the patient’s heat sensation in
the treated area. The intensity and treatment time values given in the application table should be observed. For maximum deep effects apply the inductive coil applicator directly to the body through a single layer of towelling.

Watch the patient-coupling indicator (16), to ensure maximum patient coupling. Pay particular attention when applying the Triplode. Due to its large surface area, this electrode can transfer all of the maximum 200-W output power of the Auto*Therm to large muscular areas such as the chest and back. The maximum effect is obtained by applying it to the body surface as flat as possible.

If the patient gets too hot, do not move the Triplode away from the body. Instead, decrease the output power intensity. If the patient turns off the Auto*Therm 395 by pulling the ripcord, check the actual intensity shown in the intensity display (15) and readjust, if necessary, to obtain reproducible results within a treatment series.

If the patient responds to excessive output power (intensity) by moving away from the Triplode rather than pulling the ripcord, insufficient coupling to the body may occur. Fewer than 8 to 10 LED’s will be illuminated in the coupling display. If this is allowed to happen over a period of time, the adjusted electric output power will be converted into heat not only in the patient but also in the Triplode applicator. This overheating may cause damage to the Triplode. It is imperative for this reason, to frequently check the patient and the coupling when using the Triplode applicator.

For safety reasons, the side wings of the Triplode are equipped with small ventilators to cool it when medium and higher output intensities are used.

Unfortunately, we must point out that failures due to operator error are not covered by the claims of warranty and may be very expensive.

Good coupling between patient and the Triplode exists when 8 to 10 LEDs of the coupling indicator are lit. This means that an optimum of about 80 to 100 per cent of the adjusted output power is being converted into heat in deeper tissues of the patient.

When in special applications, e.g. treatment of both knees at the same time, matching cannot be obtained, use the following formula as a rule of thumb:

$$\text{Maximum intensity} = \text{Number of illuminated LEDs (16)} \times 20 \text{ watts}$$

The Triplode can heat up and possibly get damaged at higher intensities with insufficient coupling.

### 6.5 Applicator loading

The loadabilities of individual applicators depend on their surfaces. The Auto*Therm 395 helps to prevent overheating of the inductive coil applicators and/or the patient by automatically limiting the output power (intensity) of each applicator. When the operator correctly matches the applicator to its selection on the membrane control panel, output intensity is limited to the values listed below.

<table>
<thead>
<tr>
<th>Selector</th>
<th>Applicator</th>
<th>Power limit in Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>6—</td>
<td>8 cm diameter inductive coil applicator</td>
<td>30</td>
</tr>
<tr>
<td>7—</td>
<td>14 cm diameter inductive coil applicator</td>
<td>90</td>
</tr>
<tr>
<td>8—</td>
<td>15 x 35 cm Triplode</td>
<td>200</td>
</tr>
<tr>
<td>9—</td>
<td>4.2 cm diameter condenser applicator or Flexible 8 x 14 condenser applicator</td>
<td>21</td>
</tr>
<tr>
<td>10—</td>
<td>8.5 cm diameter condenser applicator or Flexible 12 x 18 cm condenser applicator</td>
<td>80</td>
</tr>
<tr>
<td>11—</td>
<td>13 cm diameter condenser applicator</td>
<td>200</td>
</tr>
</tbody>
</table>

When different condenser applicators are combined, the smallest type of applicator determines the maximum intensity. Deviations are possible depending on the heating felt by the patient.
7 What to do when problems occur

We have found that most problems occur because of inadvertent operating errors. Therefore, when the Auto-Therm 395 displays an error code, please check whether the operating instructions have been correctly followed (sections 5 and 6).

If displays (14) and (15) and the light in the power switch (1) do not light when the unit is turned on, check whether the unit is correctly connected to an active wall outlet and the power cord is connected to the unit. Then check the fuses at the mains voltage connection to the unit (33). Remove the power cord and lift the latch to remove the drawer containing the fuses (33). Check the fuses and replace one or more of them, if necessary. When you are done, reinsert the fuse drawer until the latch closes.

ATTENTION:

Replace fuses with ones of the same rating and type. If the fuses blow frequently, please contact service.

If the error message “FE“ appears in the Intensity display (15) while turning the intensity knob (17) clockwise check whether all parameters (mode of operation, applicator, time) are set.

If display (16) shows only little or no coupling during the automatic tuning process indicated by “A“ in the time display (14) check whether the applicator(s) used correspond(s) to those chosen indicated by the illuminated “APPLICATOR” button. i.e., insure that the correct applications are chosen.

Furthermore, check whether the applicator cable is connected firmly to the unit and to the applicator. The treatment area should be larger than or the same size as the applicator surface.

The unit beeps if it is incorrectly adjusted. To assure safe operation of the Auto-Therm 395 and, thus the safety of the patient, a number of control measures have been programmed into the unit, which cause the power output to stop and an error code to be displayed (see section 5.9 for a complete list of possible error codes).
8 Summary of operations

- Connect the appliance to the power outlet.  
- Connect the applicator(s) to the device.  
- Attach the applicator(s) to the patient.  
- Turn on the unit using the power switch (1).  
- Select the mode of operation, selectors (3), (4), (5).  
- Select the applicator(s), selectors (6) to (11).  
- Set the treatment time (12), (13).  
- Start power output by turning intensity control knob clockwise.  
  Wait for tuning.  
- Turn the intensity control knob (17).  
  Electric power is applied to the output, the treatment timer starts operation.
- When the chosen treatment time has completed, the unit automatically turns off and beeps for about 10 seconds. After one minute the unit automatically resets to its initial settings. You may also reset the unit immediately, by turning intensity knob (17) counterclockwise.
- When an error is displayed (except FE) press the “RESET” button (2). Readjust parameters, if necessary for correct operation.
- The entire unit is turned off by pushing the on/off switch (1) to the off position.
9 Specifications

Mains voltage, standard
  115 VAC ± 10 %; 50/60 Hz
  Optional
  230 VAC ± 10 %; 50/60 Hz

Electric fuses (external)
  16 A, slow acting for 115 VAC
  10 A, slow acting for 230 VAC

Mains fuses for the appliance circuit, externally accessible
  2 x FST 7 AS for 115 VAC (6.3 x 32)
  2 x FST 6.3 AF for 230 VAC (5 x 20)

Power consumption, maximum
  about 700 W
  Stand-by operation
  about 100 W

Frequency
  27.12 MHz ± 0.6 %

Power equivalent *
  400 W

RF output power at 50 Ω,
  continuous mode,
  200 W
  pulsed mode
  30 W

Pulse parameters
  Peak pulse power
  400W
  Pulse repetition frequency
  70 Hz / 350 Hz
  Pulse width
  2 ms / 0.4 ms

Dimensions
  (33.5" x 15.0" x 15.4")
  85 cm x 38 cm x 39 cm

Weight
  99 lbs.
  45 kg

Outputs
  1 coaxial output (screened) for inductive coil applicators
  1 set of outputs for condenser applicators

Safety tests
  UL 2601-1:1997
  EN60601-1:1990 +A1+A2+A13
  IEC60601-2-3:1993+A1

Operating Temperature
  +50°F – +95°F

Humidity:
  Operating: 5% – 90% non condensing
  Non-operating: 5% – 90 % non condensing

Storage and Shipping Temperature:
  -4°F – +140°F

Storage Humidity:
  5% – 90 % non condensing

Storage Pressure:
  500 hPa – 1060 hPa
## 10 Accessories

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3951   | **Inductive coil set** *  
1 four-joint arm  
1 — 14 cm diameter inductive coil applicator  
1 special field inductive coil cable |
| 3952   | **Condenser field set** *  
2 four-joint arms  
2 — 13 cm diameter condenser applicators  
2 cables for condenser applicators |
| 3953   | **Plate applicator set 1**  
2 — 8 cm x 14 cm soft-rubber plate applicators with flexible cables  
6 felt spacers  
2 cloth covers  
2 perforated rubber bands with buttons |
| 3954   | **Plate applicator set 2**  
2 — 12 cm x 18 cm soft-rubber plate applicators with flexible cables  
6 felt spacers  
2 cloth covers  
2 perforated rubber bands with buttons |
| 3955   | 8 cm diameter inductive coil applicator without cable |
| 3956   | 14 cm diameter inductive coil applicator without cable |
| 3957   | Special inductive coil cable, interference eliminated for 3956 |
| 3958   | 15 cm x 35 cm Triplode inductive coil applicator with cable |
| 3959   | 4,2 cm diameter condenser applicator |
| 3960   | 8,5 cm diameter condenser applicator |
| 3961   | 13 cm diameter condenser applicator |
| 3962   | 8 cm x 14 cm soft-rubber plate applicator with flexible cable |
| 3963   | 12 cm x 18 cm soft-rubber plate applicator with flexible cable |
| 3964   | 10 cm x 16 cm felt spacer for soft-rubber plate applicators |
| 3965   | 14 cm x 20 cm felt spacer for soft-rubber plate applicators |
| 3966   | 14 cm x 22 cm cloth cover for soft-rubber plate applicators |
| 3967   | 18 cm x 26 cm cloth cover for soft-rubber plate applicators |
| 3968   | 3,2 cm x 100 cm perforated rubber band with button |
| 3969   | Button for perforated rubber band |
| 3970   | 5 cm x 60 cm elastic Velcro band, |
| 3971   | 5 cm x 120 cm elastic Velcro band, |
| 3972   | Four-joint arm |
| 3973   | Cable for condenser applicator |
| 3974   | Neon check light |

* Select either the inductive coil or condenser field set to accompany the basic unit.

The specifications and instructions presented in this manual are in effect at the time of its publication. These instructions may be updated at any time at the discretion of the manufacturer.