

# ADVANCE 1 MHZ ULTRASOUND THERAPY



**SUPER PRO 100**

## INSTRUCTION MANUAL

Sun Medisys Inc.  
An ISO 9001:2015 Certified Company  
An ISO 13985:2012 Certified Products

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**SUN MEDISYS INC.**



Welcome to the Sun Medisys Inc.

Thank you for trusting Sun Medisys Inc. and considering us.

CONGRATULATIONS for purchasing our next generation 1 MHz Ultrasound Therapy Unit Super Pro 100 unit.

We understand what it takes to get this, and certainly, there must have been lots of planning and research involved before the purchase.



Sun Medisys Inc., an independent family-run business, started its operation way back in 2000.

With great integrity, high ethical values, stringent quality control, backed up by highly motivated employee force with tremendous efforts and disciplined activity business; we are a registered ISO 9001:2015 manufacturer.



We reassure you that what you have chosen is right.

Thanks

For Sun Medisys Inc.

## INTRODUCTION

The method of treatment for various conditions falling in the preview of physiotherapy using a specific frequency of sound is called ULTRASOUND THERAPY.

The sound waves which can be heard by human ears are called audio waves (about 20 to 20000 Hertz) and which cannot be heard (above 20 Kilo Hertz) are called Ultrasound waves. The vibration below 20 Hertz is called infrasonic or Infrasound. The meaning of words sound and sonic are the same.

When the electric potential is applied on the Quartz or Barium titanate or Zirconate titivate crystal of a specific size, it starts vibrating and produces sound. If the potential is increased, the sound cannot be heard and thus ultrasound is produced. It is called the piezoelectric phenomenon. This piezoelectric is used in both Diagnostic and Therapeutic Ultrasound machines. The probe or head through which ultrasound is subjected into the body is called Transducer. In diagnostic ultrasound (sinology) the transducer has an array of sonar detected which sends the signal to the microprocessor-based circuit of the machine where the sound is converted into a digital picture of the area scanned. This detector array is not present in the case of therapeutic ultrasound machines.

Therapeutic ultrasound refers generally to any type of ultrasonic procedure that uses ultrasound waves for therapeutic benefit.

Ultrasound is applied using a transducer or applicator that is in direct contact with the patient's skin. The gel is used on all surfaces of the head to reduce friction and assist transmission of the ultrasonic waves. Therapeutic ultrasound in physical therapy is alternating compression and rarefaction of sound waves with a frequency of 0.7 to 3.3 MHz. Maximum energy absorption in soft tissue occurs from 2 to 5 cm. Intensity decreases as the waves penetrate deeper. They are absorbed primarily by connective tissue: ligaments, tendons, and fascia (and also by scar tissue).

## INDICATIONS FOR ULTRASOUND

Conditions for which ultrasound may be used for treatment include the following examples: ligament sprains, muscle strains, tendonitis, joint inflammation, plantar fasciitis, metatarsalgia, facet irritation, impingement syndrome, bursitis, rheumatoid arthritis, osteoarthritis, and scar tissue adhesion.

### What is the difference between 1 & 3 MHz Ultrasound Machines?

The difference between both frequencies in Ultrasound Machines is to do with the depth the sound waves penetrate, which is important when deciding which machine would work best for you.

**1 MHz** Ultrasound Machine would be appropriate for treating tissue that is between 2.3 and 5cm in depth – this would be great for pain relief for several conditions.

**3 MHz** Ultrasound Machine would be appropriate for treating tissue at depths between 0.8 cm and 1.6 cm – this is usually fantastic for scar tissue, cellulite reduction, and skin conditions.

## EFFECTS OF ULTRASOUND

When ultrasound enters the body there were two effects on the tissues called thermal and non-thermal effects:

- **THERMAL EFFECTS:** When ultrasound travels through the tissue of the body some of its energy is absorbed by the tissue and creates heat within the tissue as a result of absorption. The quantity of Ultrasound absorption depends on the vascularity, nature of the tissue, and frequency of

Ultrasound. The absorption is more in tissues of high protein contents.

While the tissues have high-fat contents absorb less. A therapeutic thermal effect can be achieved if the temperature of the tissue is raised between 42 to 48 degrees C for 5 minutes and pain relief decrease in joint stiffness and increased blood flow can be obtained. Structures that are heated by the ultrasound are periosteum, Superficial bone, menisci joint, skeletal muscles, tendon, major nerve roots.

• **NON-THERMAL EFFECTS:** There are many situations when Ultrasonic produces therapeutic results without involving raise in the temperature, like in stimulation of generation, soft tissue repair, blood flow in chronic tissue, and repair. It is possible to increase the rate of repair of fractures using 1.5 MHz or greater in pulse mode. The treatment should be given for 5 minutes 4 times a week. The most effective treatment was found during the first 2 weeks of bone repair.

It should be noted that the attenuation of therapeutic Ultrasound increases with the quantity of portion present in the structure under the treatment, and attenuation decreases with water contents. In the high vascular tissue like muscle there will be fast heat dispersion (dissipation) resulting in the non-significant rise of temperature. But the tissue like tendons, ligaments, and connective tissue high and fast temperature rise occurs as they possess less water and are less vascular. Heating of tendons, scars, ligaments, joint capsule, etc. cause an increase of flexibility and thus the stiffness of these is decreased.

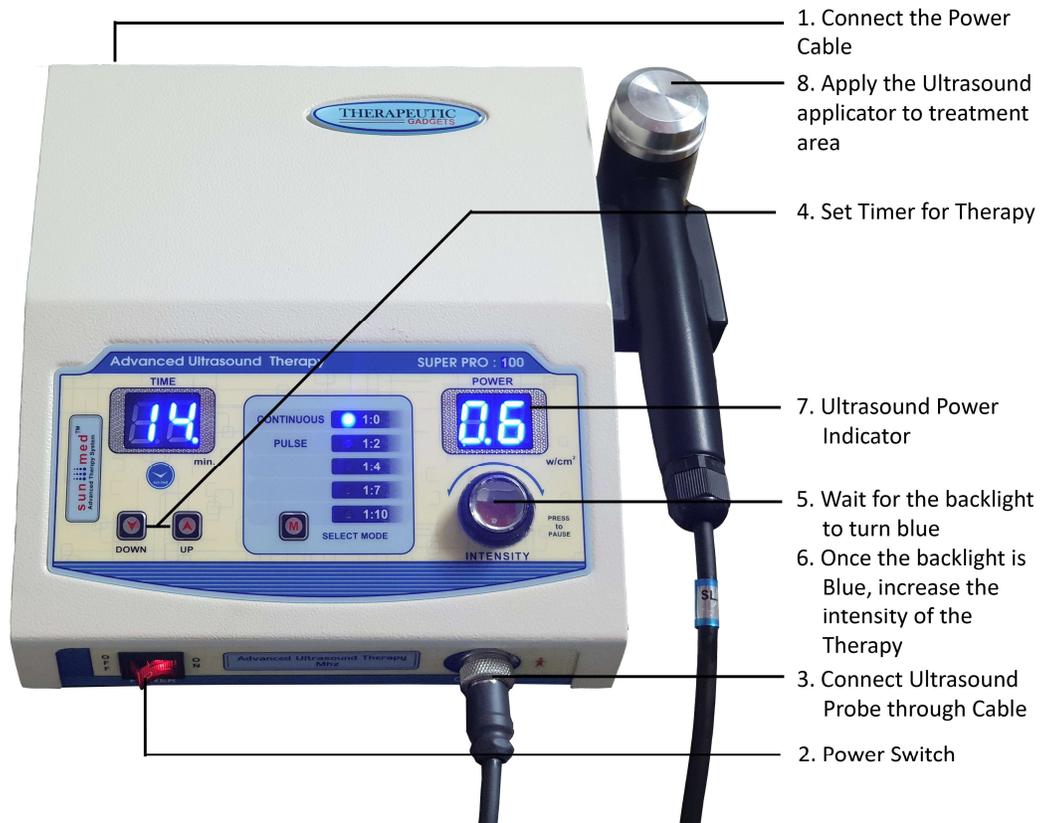
## CAVITATION

When ultrasonic therapy is applied to the body, after 30 to 60 seconds small bubbles are formed inside the tissue due to the vibration, this phenomenon is called cavitation.

These bubbles are about one micron in diameter. The cavitation is of two types- stable and unstable. Stable cavitation is of therapeutic importance. When the cavitation results in the formation of bubbles of the increasing diameter, which after a few seconds implode and damage to the tissue, is called transient which generally occurs at high intensity.

## QUICK START GUIDE

- Check all the accessories with the Main unit like the Probe and power cable.
- Now connect power cable with Ultrasound Unit as well as Mains power plug.
- Connect Ultrasound probe to Ultrasound output socket.
- Press the Power button which will start glowing red color.
- Press the Intensity Control/ button. Now all displays and LED will be ON.
- Set desired treatment time by pressing the + button.
- Now you can also select output mode by pressing the “M” button.
- If all the parameters are set then Press Intensity control to start therapy.
- Now the Blue/yellow light will glow under the intensity button. It means the unit is ready for treatment.
- Now increase the intensity by rotating intensity control clockwise, and the therapy will start. During treatment you can also pause treatment by pressing the intensity control button and parameters can also be changed.
- By pressing again intensity control unit will start with set parameters.
- At the end of therapy output will become Zero and the buzzer will sound.
- Unit will go to sleep mode for a few seconds after the end of therapy.



1. Connect the Power Cable
2. Power Switch
3. Connect Ultrasound Probe through Cable
4. Set Timer for Therapy
5. Wait for the backlight to turn blue
6. Once the backlight is Blue, increase the intensity of the Therapy
7. Ultrasound Power Indicator
8. Apply the Ultrasound applicator to treatment area



- Mains Socket
- Probe
- Power Indicator
- Intensity Control
- Timer Keys
- Probe Output
- Mains Switch

## **METHOD OF APPLICATION**

1. Inspect the skin for the presence of any cut, wound rashes, or skin diseases, if so ultrasound treatment shall not be given on that particular area.
2. Clean the skin with tissue paper or cotton, preferably wet cotton.
3. Position the patient in such a way that the application area is well visualized and the patient can sit or lay down during the treatment. The ease of patient is of utmost importance.
4. Bring the machine near the patient.
5. Place a good quantity of coupling medium on the area to be treated.
6. Activate the machine and set the timer and intensity after keeping the transducer on the skin of the patient.
7. Ultrasound is being delivered into tissue, now keep the head of the transducer at 90 deg. to the patient skin and make small circular movements throughout the treatment. The most painful area should be focused on.

Remember that the head should be in good contact with the skin and a sufficient coupling medium should be there. If it is needed to put more coupling medium. Switch the machine OFF, pour the coupling medium and then turn on the machine.

- **TREATMENT TIME:** There is no hard or fast rule for the treatment time and number to 10 minutes (depending on the area to be treated) for 5 days from the treatment plan. As the pain reduces, the dose or time can be reduced. Later on, an ultrasound is given on alternate days and then stopped. High-intensity dose not be used after 5 days.
- **COUPLING MEDIUM:** To make a fire contact between the skin of the patient and transducer: jelly or olive oil, or liquid paraffin is used. These are called coupling mediums or coupling agents. A coupling medium should have the following properties:
  - Gel-like viscosity for ease of use.
  - Non-allergic.
  - Chemically inert.
  - Transparent.
  - Inexpensive.

## **ULTRASONIC DOSE RANGE:**

Low Intensity: 0.1 to 0.8 Watts/cm<sup>2</sup>

Medium intensity: 0.8 to 1.5 Watts /cm<sup>2</sup>

High intensity: 1.5 to 3.0 Watts /cm<sup>2</sup>

## **STANDARD ACCESSORIES:**

The Ultrasound Therapy Unit will be supplied with the following accessories:

1. Main Ultrasound Unit 1 No.
2. 1 MHz Applicator (Probe) 1 No.
3. Applicator Wire 1 No.
4. Main Cable 1 No.
5. User's Manual 1 No.
6. 1 Amp Fuse (Extra) 1 No. (Within the Ac Socket)

## TECHNICAL SPECIFICATIONS

Mains Voltage	100-230v AC 50/60 Hz ±10% SMPS Supply
Maximum Power Consumption	40 VA
Treatment Time	Up to 60 min.
Emission Frequency	1 MHz ±10%
Modes	Continuous; Pulse i.e. 1:2, 1:4, 1:7 & 1:10
Ultrasound Power	2.5 w/cm <sup>2</sup> in continuous 3.5 w/cm <sup>2</sup> in pulsed
Fuse	1 Amp (within AC socket) 3 Amp (for ultrasound output)
Weight	2.0 kg (approx.)
Packing Dimensions	28 X 28 X 16 cm

## MAINTENANCE

There is very little maintenance required for the UST Mini. If the ON/OFF switch lamp does not glow steadily when the switch is put on, the problem could be a blown fuse.

To replace a burnt-out fuse, remove it from the fuse holder and replace it only with a 1A/250V Fuse.

### **DISCONNECT THE POWER TO THE INSTRUMENT BEFORE REMOVING THE FUSE FROM THE HOLDER.**

There are no other user-serviceable parts inside the instrument. Refer all problems to the nearest dealer or write to us at our email: [sunmedisys@gmail.com](mailto:sunmedisys@gmail.com), you can Also Visit us and write your query at [sunmedisys.com](http://sunmedisys.com)

### Replacement of Fuse:

There is one mains fuse and one extra fuse within the mains fuse socket, to replace the mains fuse peel out the fuse socket with a fingernail and replace the fuse with the extra fuse - push the fuse back into the socket until you hear a click.

## WARNING

- Before using the equipment, the user should read carefully the instructions contained in this manual.
- Before treating a patient, the user should familiarize himself with the operating modes and have a clear knowledge of indications & contraindications for the use of apparatus.
- Please insure this manual is readily available at all times to the personnel authorized to use the apparatus.
- For safety purposes, the power cord has been fitted with an earthed plug.
- **ONLY USE AN EARTHED POWER SUPPLY SOCKET.**
- The unit must be connected to approve the power supply system.
- Do not use the apparatus close to SWD or MWD devices, which may cause instability in output and functioning in the program.
- Never leave the patient unattended during the treatment.
- The apparatus may not be used in so-called "wet rooms" (hydrotherapy rooms).
- Sun Medisys will not be responsible for Therapy Effects resulting from improper use of the apparatus.

# WARRANTY CERTIFICATE

**Customer Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

**Equipment Name:** \_\_\_\_\_

**Serial No.:** \_\_\_\_\_

**Warranty Form:** \_\_\_\_\_ **To** \_\_\_\_\_

The Instrument is warranted by the manufacturer for one year from the date of purchase and during this period, the defective parts shall be replaced or repaired, free of charges, if it is due to faulty material or workmanship, subject to the following Terms and Conditions.

- The Instrument should be used properly following the instructions as given in the instruction manual.
- The warranty does not cover the Instrument attended by others except our authorized service center/dealer.
- Replacement of parts made of Rubber Electrodes, Laser Probe, Laser Diode, enclosure and carry bag are not covered within this Warranty.
- The cost incurred bringing the machine to our dealer's premises or service center and back are to be borne by the customer.
- The Warranty does not cover the Instrument operated outside the range of stipulated Electric Supply i.e. below 198 volts and above 242 Volts.
- The decision of the manufacturer is final in all cases of warranty claims.

HERE CERTIFIED  
Yours Truly

Sun Medisys Inc.