

ISO 13485:2003



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User Manual

PHOTOTHERAPY



[www.mtts-asia.com](http://www.mtts-asia.com)

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# INTRODUCTION

Phototherapy is one of the simplest and safest methods to treat jaundice in neonatal intensive care. Untreated jaundice leads to an excessive level of bilirubin in blood which may potentially result in brain damage or death.

## What does phototherapy do?

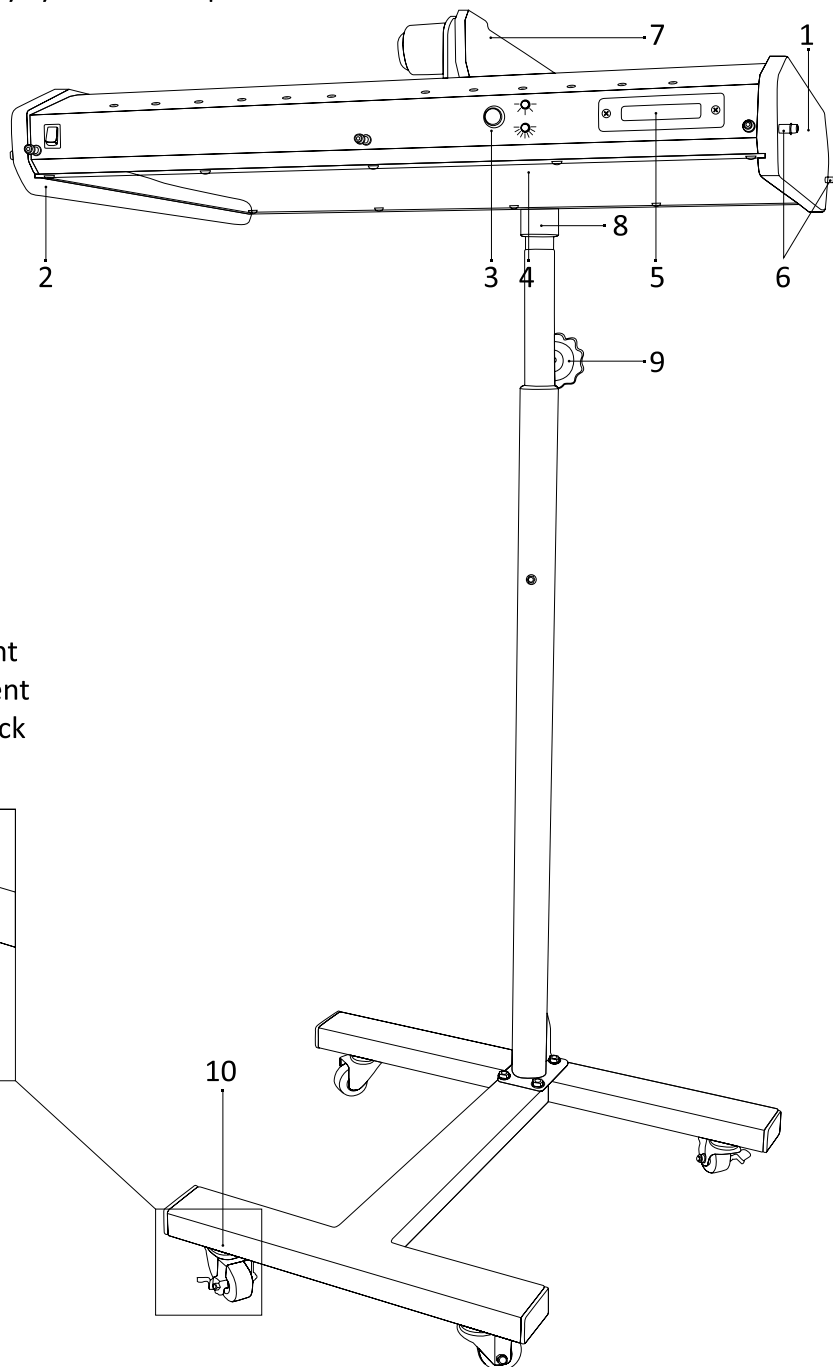
- ★ Reduces the bilirubin level in the blood through:
  - Photo - oxidation
  - Configurational isomerisation
  - Structural isomerisation
- ★ Starts medical treatment immediately after it's turned on
- ★ Emits no heat because of the LED light source, so does not cause dehydration.

# SAFETY INFORMATION

- ★ In case of any malfunction do not attempt to service this machine by yourself. The MTTS phototherapy should only be serviced by a qualified technician.
- ★ Do NOT disassemble any part of the phototherapy.
- ★ When your Phototherapy has been moved into position next to the baby, DO NOT FORGET to apply the brake on the wheels in order to prevent the Phototherapy from moving.
- ★ Only use the Phototherapy with the supplied power cable.
- ★ Do not use the top of the Phototherapy as a bench to store things on.
- ★ Only use correctly rated fuses (2 ampere, slow blow, 5mm x 20mm).
- ★ The Phototherapy should only be used with grounded power outlets.
- ★ When using the Phototherapy with an Infant Warmer, take care that the Phototherapy does not get dangerously hot.

# SYSTEM DIAGRAM

The MTTTS Phototherapy system is composed of:



1. Overhead unit
2. Power switch
3. Boost button
4. Boost indicators
5. Display
6. Curtain hangers
7. Angle adjustment
8. Height adjustment
9. Height/swivel lock
10. Lockable castors



# INSTALLATION INTRUCTIONS

Step 1: Remove the components from the box.  
There should be 4 individual parts. (fig 1)



Figure 1

# INSTALLATION INTRUCTIONS

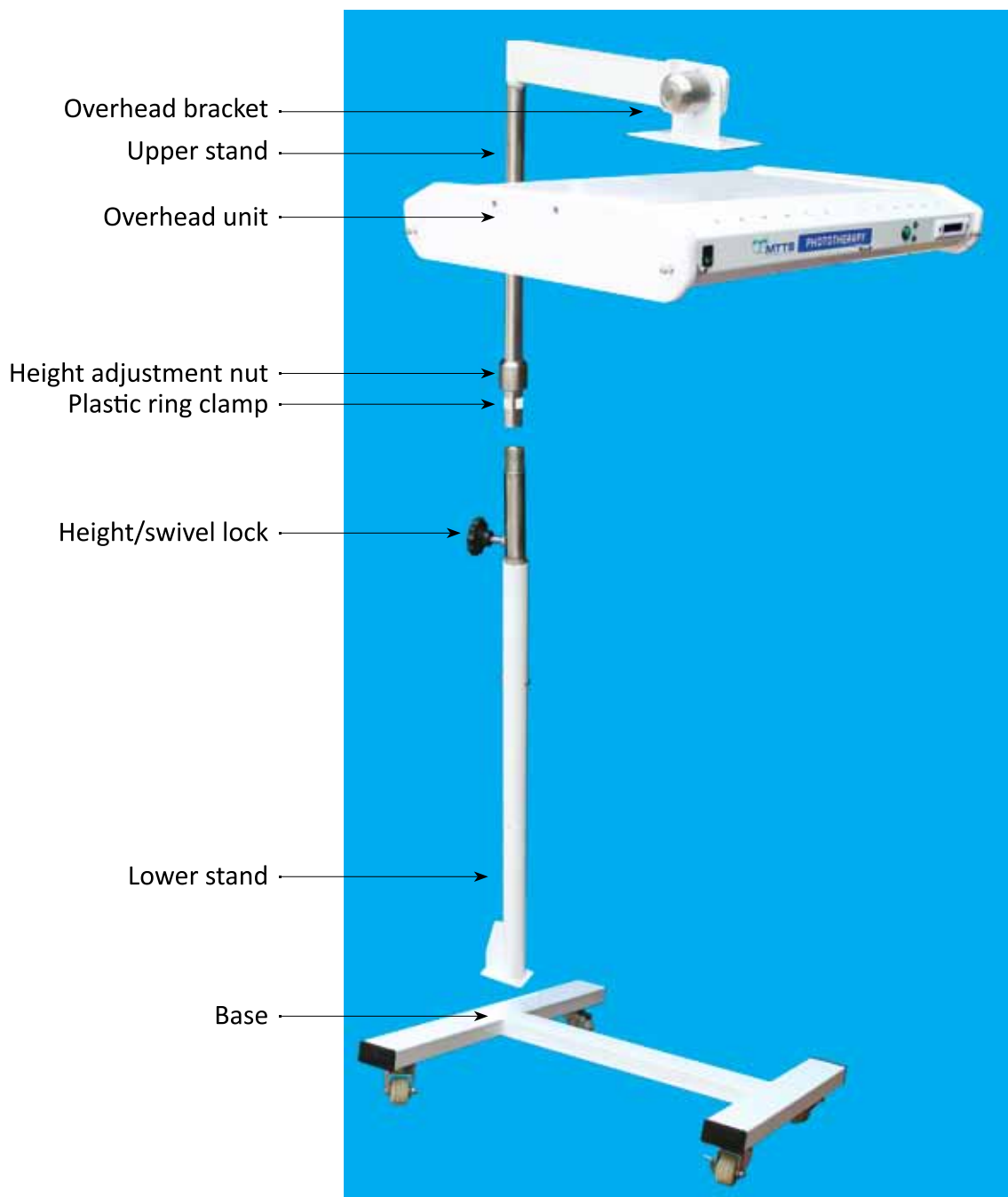


Figure 2

# INSTALLATION INTRUCTIONS

Use a wrench to screw 4 bolts through the lower stand, into the base. (fig 3)

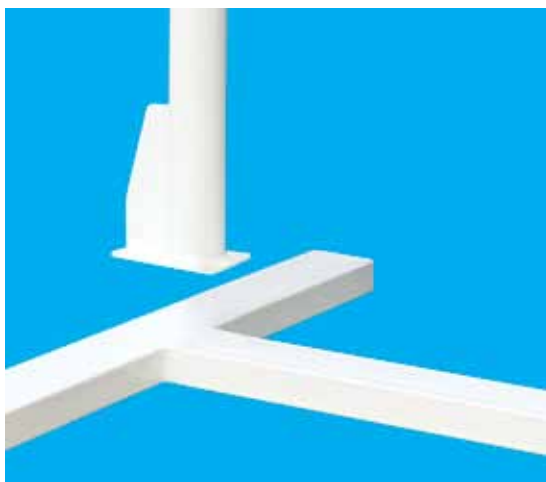


Figure 3

Note: To make sure the connection is strong, use a washer and spring washer as shown below. (fig 4)

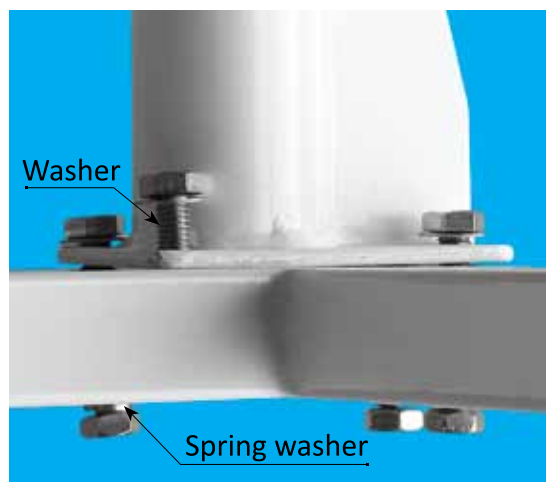


Figure 4

Unscrew (anticlockwise) the height/swivel lock to ensure the upper stand will easily slide into the lower stand. (fig 5)

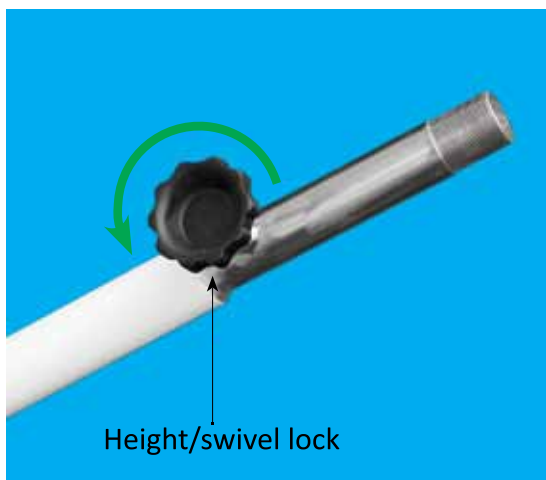


Figure 5

Remove the height locking nut and the plastic ring clamp from the lower stand, and slide them onto the upper stand. (fig 6, 7)

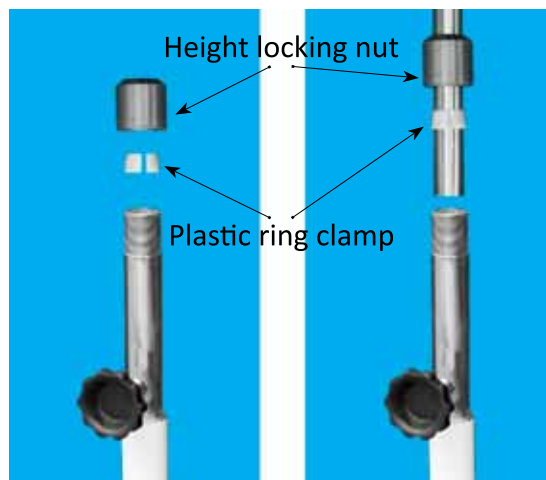


Figure 6

Figure 7

# INSTALLATION INTRUCTIONS

Insert the upper stand into the lower stand. (fig 8), then tighten the stainless steel nut onto the lower stand. (fig 9)

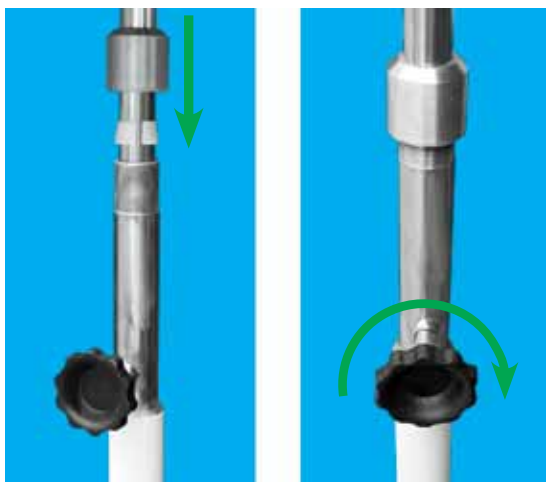


Figure 8

Figure 9

Using a Phillips head screwdriver, screw in 4 screws (enclosed) to fasten the overhead bracket to the overhead unit. (fig 10, 11)



Figure 10

After installation is complete, your unit should look like this. (fig 12)

Note: make sure these screws are tight



Figure 11



Figure 12

# FUNCTIONS

## *On/off switch*



Figure 13

To turn on the machine, set the power switch to '1'. Whenever you turn on the machine, the following things happen:

- The blue LEDs for therapy will illuminate.
- One green LED will illuminate next to the normal mode icon.
- The total amount of hours the unit has been used will appear in the display for 4 seconds.
- A counter will start counting upwards in seconds from 0.

If any of these things do not happen, please inform MTTs.

## *Boost button*



Figure 14

The green boost button allows you to toggle between “normal mode” and “boost mode”.

- Normal mode:  
Provides light at 25  $\mu\text{W}/\text{cm}^2/\text{nm}$ .
- Boost mode:  
Provides light at 40  $\mu\text{W}/\text{cm}^2/\text{nm}$ .

# FUNCTIONS

You can tell which mode you are in by looking at the green LED on the front panel. If this LED is lit:

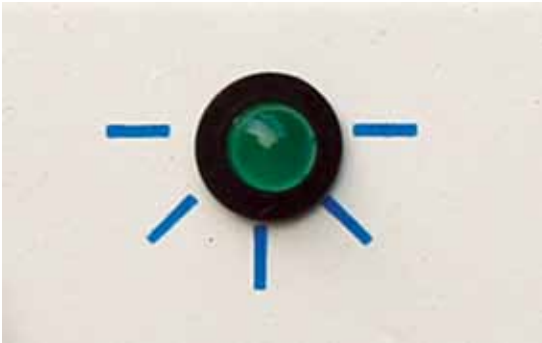


Figure 15

The machine is in normal mode.  
If this LED is lit:



Figure 17

## The display can show 3 things:

- The amount of time that has passed since the unit was most recently turned on. This is what you will usually see displayed on the timer. If you change modes the counter will not be interrupted. For example, if you provide phototherapy for 2 hours in normal mode, then 3 hours in boost mode, the counter will read 5 hours. The display shows hour.minutes.seconds.

## Display



Figure 16

The machine is in boost mode.

Note that boost mode will only last for 3 hours before the device reverts to normal mode. If you want to continue in boost mode, just press the boost button again.

Note that the device will only ever turn on in “normal” mode which provides  $25\mu\text{W}/\text{cm}^2/\text{nm}$ .

- The total amount of time that the machine has been used. This is only shown for the first 4 seconds after the machine is turned on.
- The total amount of time that the machine has been used in boost mode. You can view this by pressing and holding down the boost button. As soon as you let go of the boost button, the display reverts to showing the amount of time that has passed since the unit was last turned on.

# FUNCTIONS

## *Angle Adjustment*



Figure 18

To adjust the angle of the overhead unit:

- Turn the angle adjustment knob on top of the unit anticlockwise to loosen it.
- Adjust the angle of the overhead unit by swinging it to the desired angle - it should move freely.
- Tighten the angle adjustment knob by turning it clockwise.

## *Height Adjustment*



Figure 19

There are 2 things that need to be unlocked in order to change the height - the stainless steel height adjustment nut and the plastic height/swivel lock knob.

To adjust the height of the machine, use 2 people:

- 1 person should hold the overhead unit to keep it from falling when it is unlocked.
- The other person can then turn both the stainless steel height adjustment nut and the plastic height/swivel lock knob anticlockwise to unlock them.
- Adjust the height of the overhead unit by lifting or lowering it.
- Tighten both knobs by turning them clockwise.

# FUNCTIONS

## *Wheel locking*



Figure 20

The wheels on the bottom of the phototherapy can be locked to prevent the device from moving around.

Use your foot to press on the tab that says "ON" to apply the lock. Press on the tab that says "OFF" to release the lock.

## *Curtains*



Figure 21

Your Phototherapy can be surrounded by curtains to improve the efficiency of phototherapy. Curtains also prevent light from the phototherapy from distracting staff in the NICU.

The rings in the curtains align with the curtain hangers on the phototherapy. Simply hang the curtains on these rings.



# SPECIFICATIONS

- ★ Input Voltage: 100 to 240 volts
- ★ Input frequency: 47 to 63 Hertz
- ★ Power requirement: 75 Watt
- ★ Fuse: 2A, slow blow, 5 x 20mm
- ★ Irradiance (normal): 25  $\mu\text{W}/\text{cm}^2/\text{nm}$  @ 40cm
- ★ Irradiance (boost): 40  $\mu\text{W}/\text{cm}^2/\text{nm}$  @ 40cm
- ★ Wavelength: 455nm
- ★ Expected LED lifetime: 50,000 hours  
(10 years @ 50% usage, 5 years @ 100% usage)
- ★ Height: 132 to 165cm
- ★ Width: 69cm
- ★ Weight: 18 kg (22kg packed)

# TROUBLESHOOTING

Your MTTS Phototherapy should provide you with many years of reliable service. However, if you do encounter problems, please use the following table to guide you. If this guide does not solve your problem please call MTTS for assistance.

Phototherapy won't turn on.	Plug the phototherapy into another outlet you know works. If the Phototherapy turns on, the outlet originally used has a problem. Do not use that outlet.
	If you have another MTTS phototherapy, use it's power cable on the phototherapy which won't turn on. If your phototherapy now operates, call MTTS for a replacement power cable.
1 or more LEDs not illuminating.	Call MTTS.
Light intensity seems too high/low.	Are you using the phototherapy in the right mode? Press the boost button to cycle between normal and boost modes.
	Use an MTTS lightmeter to measure the irradiance from the LEDs. Normal mode irradiance should be $25 \mu\text{W}/\text{cm}^2/\text{nm}$ @ 40cm, boost mode irradiance should be $40 \mu\text{W}/\text{cm}^2/\text{nm}$ @ 40cm. If irradiance is under X $\mu\text{W}/\text{cm}^2/\text{nm}$ than expected please contact MTTS.
Overhead unit does not stay in position when put on an angle.	Make sure the angle adjustment nut is done up tight.

# WARRANTY POLICY

## General Terms

This MTTS Limited Warranty gives you, the customer, express limited warranty rights from MTTS, the manufacturer for the duration specified on the Warranty Card. Please refer to the MTTS Web site for an extensive description of your limited warranty entitlements. In addition, you may also have other legal rights under applicable local law or special written agreement with MTTS.

MTTS MAKES NO OTHER EXPRESS WARRANTY OR CONDITION WHETHER WRITTEN OR ORAL AND MTTS EXPRESSLY DISCLAIMS ALL WARRANTIES AND CONDITIONS NOT STATED IN THIS LIMITED WARRANTY. TO THE EXTENT ALLOWED BY THE LOCAL LAW OF JURISDICTIONS OUTSIDE THE UNITED STATES, MTTS DISCLAIMS ALL IMPLIED WARRANTIES OR CONDITIONS, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. FOR ALL TRANSACTIONS OCCURRING IN THE UNITED STATES, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY SET FORTH ABOVE. SOME STATES OR COUNTRIES DO NOT ALLOW A LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS. IN SUCH STATES OR COUNTRIES, SOME EXCLUSIONS OR LIMITATIONS OF THIS LIMITED WARRANTY MAY NOT APPLY TO YOU. FOR CONSUMER TRANSACTIONS, THE LIMITED WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT, OR MODIFY BUT ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

This Limited Warranty is applicable in all countries and may be enforced in any country or region where MTTS or its authorized service providers offer warranty service for the same product model number subject to the terms and conditions set forth in this Limited Warranty.

Under this MTTS Limited Warranty, products purchased in one country or region may be transferred to another country or region where MTTS or its authorized service providers offer warranty service for the same product model number. Warranty terms, service availability, and service response times may vary from country or region to country or region. Standard warranty service response time is subject to change due to local parts availability. If so, your MTTS authorized service provider can provide you with details. MTTS will not alter form, fit, or function of this MTTS product to make it operate in a country for which it was never intended to function for legal or regulatory reasons. MTTS is not responsible for any tariffs or duties that may be incurred in transferring the products.

MTTS guarantees that the MTTS Phototherapy that you have purchased or leased from MTTS is free from defects in materials or workmanship under normal use during the Limited Warranty Period. The Limited Warranty Period starts on the date of purchase or lease from MTTS, or from the date MTTS completes installation. Your dated sales or delivery receipt, showing the date of purchase or lease of the product, is your proof of the purchase or lease date. You may be required to provide proof of purchase or lease as a condition of receiving warranty service. You are entitled to hardware warranty service according to the terms and conditions of this document if a repair to your MTTS Phototherapy is required within the Limited Warranty Period.

Unless otherwise stated, and to the extent permitted by local law, new MTTS Phototherapy may be manufactured using new materials or new and used materials equivalent to new in performance and reliability. MTTS may repair or replace MTTS Phototherapy (a) with new or previously used products or parts equivalent to new in performance and reliability, or (b) with equivalent products to an original product that has been discontinued. Replacement parts are

# WARRANTY POLICY

warranted to be free from defects in material or workmanship for ninety (90) days or, for the remainder of the Limited Warranty Period of the MTTS Phototherapy they are replacing or in which they are installed, whichever is longer.

MTTS will, at its sole discretion, repair or replace any component or Phototherapy that manifests a defect in materials or workmanship during the Limited Warranty Period. All component parts removed under this Limited Warranty become the property of MTTS. In the unlikely event that your MTTS Phototherapy has recurring failures, MTTS, at its sole discretion, may elect to provide you with (a) a replacement unit selected by MTTS that is the same or equivalent to your MTTS Phototherapy in performance or (b) to give you a refund of your purchase price or lease payments (less interest) instead of a replacement. This is your exclusive remedy for defective products.

## Exclusions

MTTS DOES NOT WARRANT THAT THE OPERATION OF THIS PRODUCT WILL BE UNINTERRUPTED OR ERROR-FREE. MTTS IS NOT RESPONSIBLE FOR DAMAGE THAT OCCURS AS A RESULT OF YOUR FAILURE TO FOLLOW THE INSTRUCTIONS INTENDED FOR THE MTTS Phototherapy.

This Limited Warranty does not apply to expendable or consumable parts and does not extend to any product from which the serial number has been removed or that has been damaged or rendered defective (a) as a result of accident, misuse, abuse, contamination, improper or inadequate maintenance or calibration or other external causes; (b) by operation outside the usage parameters stated in the user documentation that shipped with the product; (c) by software, interfacing, parts or supplies not supplied by MTTS; (d) improper site preparation or maintenance; (e) virus infection; (f) loss or damage in transit; or (g) by modification or service by anyone other than (i) MTTS, (ii) an MTTS authorized service provider, or (iii) your own

installation of end-user replaceable MTTS or MTTS approved parts if available for your Phototherapy in the servicing country or region.

## Limitation of Liability

IF YOUR MTTS PHOTOTHERAPY FAILS TO WORK AS WARRANTED ABOVE, THE MAXIMUM LIABILITY OF MTTS UNDER THIS LIMITED WARRANTY IS EXPRESSLY LIMITED TO THE LESSER OF THE PRICE YOU HAVE PAID FOR THE PHOTOTHERAPY OR THE COST OF REPAIR OR REPLACEMENT OF ANY HARDWARE COMPONENTS THAT MALFUNCTION IN CONDITIONS OF NORMAL USE.

EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL MTTS BE LIABLE FOR ANY DAMAGES CAUSED BY THE PHOTOTHERAPY OR THE FAILURE OF THE PHOTOTHERAPY TO PERFORM, INCLUDING ANY LOST PROFITS OR SAVINGS OR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. MTTS IS NOT LIABLE FOR ANY CLAIM MADE BY A THIRD PARTY OR MADE BY YOU FOR A THIRD PARTY.

THIS LIMITATION OF LIABILITY APPLIES WHETHER DAMAGES ARE SOUGHT, OR A CLAIM MADE, UNDER THIS LIMITED WARRANTY OR AS A TORT CLAIM (INCLUDING NEGLIGENCE AND STRICT PRODUCT LIABILITY), A CONTRACT CLAIM, OR ANY OTHER CLAIM. THIS LIMITATION OF LIABILITY CANNOT BE WAIVED OR AMENDED BY ANY PERSON. THIS LIMITATION OF LIABILITY WILL BE EFFECTIVE EVEN IF YOU HAVE ADVISED MTTS OR AN AUTHORIZED REPRESENTATIVE OF MTTS OF THE POSSIBILITY OF ANY SUCH DAMAGES. THIS LIMITATION OF LIABILITY, HOWEVER, WILL NOT APPLY TO CLAIMS FOR PERSONAL INJURY.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT MAY VARY FROM STATE TO STATE OR FROM COUNTRY TO COUNTRY. YOU ARE ADVISED TO CONSULT APPLICABLE STATE OR COUNTRY LAWS FOR A FULL DETERMINATION OF YOUR RIGHTS.

# WARRANTY POLICY

## Limited Warranty Period

The Limited Warranty Period for an MTTS Phototherapy is a specified, fixed period commencing on the date of purchase and specified on the Phototherapy Warranty Card. The date on your sales receipt is the date of purchase unless MTTS or your reseller informs you otherwise in writing. Customer Responsibilities.

In order to avoid the risk of charges for issues not covered by your limited warranty (issues that are not due to defects in materials and workmanship on MTTS Phototherapy), you will be asked to assist MTTS as follows:

- Verify configurations, load most recent firm ware, install software patches, run MTTS diagnostics and utilities.
- Implement temporary procedures or workarounds provided by MTTS while MTTS works on permanent solutions.
- Cooperate with MTTS in attempting to resolve the problem using online chat, email, or tel phone. This may involve performing routine diagnostic procedures, installing additional software updates or patches.
- Perform additional tasks as defined within each type of warranty service listed below and any other actions that MTTS may reasonably request in order to best perform the warranty support.

## Contacting MTTS

If your Phototherapy fails during the Limited Warranty Period and the suggestions in the Phototherapy documentation do not solve the problem, you can receive support by doing one of the following:

- Locate and contact your nearest MTTS Support location via the World Wide Web at: <http://www.mtts-asia.com/en/support/warranties>.
- Contact your MTTS authorized service provider.
- Call the Technical Support Center at +84 43 766 6521

Before calling MTTS or an MTTS authorized service provider please have the following information available:

- Phototherapy serial number, model name, and Phototherapy model number.
- Applicable error messages.
- Detailed question.