

# USER AND SERVICE MANUAL

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**V1-V3 SERIES**

EN ISO 13485 : 2012

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

## Important information

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This manual will help you install and perform preventive maintenance on your MTTTS Warmer device.

Refer to MTTTS Youtube channel for more instructions:

<https://www.youtube.com/user/MTTTSasia>

Note that preventive maintenance should be performed every 6 months and all the information required is enclosed in this manual.

If you have any technical problems please contact nearest MTTTS distributor. List of distributors can be found at:

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

## General technical information

Warmer model: V1-V3 Series

Warranty: 1 year

Expected service life: 5 years

Operating conditions: the warmer has been tested to function properly in 19-40°C. If possible, use the warmer in environments within this temperature range.

Storage conditions: Keep the unit covered with a cloth or plastic cover to prevent it getting dusty or dirty. Store in a dry environment.

Class I Medical Electrical Equipment. Warning: to avoid the risk of electric shock, the warmer must only be connected to a supply mains with protective earth.

Not classified against ingress of liquids.

50-60 Hz

180-240V

300W (@180V) – 550W (@240V)

WARNING: Do not modify this equipment without authorization of the manufacturer.

WARNING: dispose of equipment properly at end of equipment service life.

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## Assembly

### Assembly

#### Step 1:

Take the cardboard box apart using a sharp knife or scissors. (Pic.1).



Pic. 1

#### Step 2:

Take the Warmer out of the box. (Pic.2).



Pic. 2

#### Step 3:

Insert the overhead stand into the bed at the available hole. (Pic.3).



Pic. 3

The 2 holes on the stand and 2 holes on the bed should align (V1 Series only). Use one hand to hold the stand and the other hand to insert the screw. (Pic. 4).



Pic. 4

Insert the enclosed pieces of black plastic (V1 Series only) to ensure a tight fit. (Pic. 5).



Pic. 5

Tighten the screws with a spanner. Make sure washers are used. (Pic. 6).



Pic. 6

#### Step 4:

Assemble the heating system onto the stand. (Pic. 7, 8).



Pic. 7



Pic. 8

Ensure the holes of the frame align with the holes of the heating system. (Pic. 9).

Screw 4 screws into the heating system by hand. (Pic. 10).

Step 5:

Connect electric wires

This photo shows the lead from the control unit. (Pic. 13).

Connect the lead from the control unit to the heating system. Twist the connector clockwise to tighten it into place. (Pic.14).



Pic. 9



Pic. 10



Pic.13



Pic. 14

This photo shows the 4 screws temporarily holding the heating system in place. (Pic. 11).

Using a spanner, tighten all 4 screws. (Pic. 12).

Connect the power cable to the control unit. (Pic. 15).

Plug the sensor into the front panel. (Pic. 16).



Pic. 11



Pic. 12



Pic. 15



Pic. 16

## Introduction

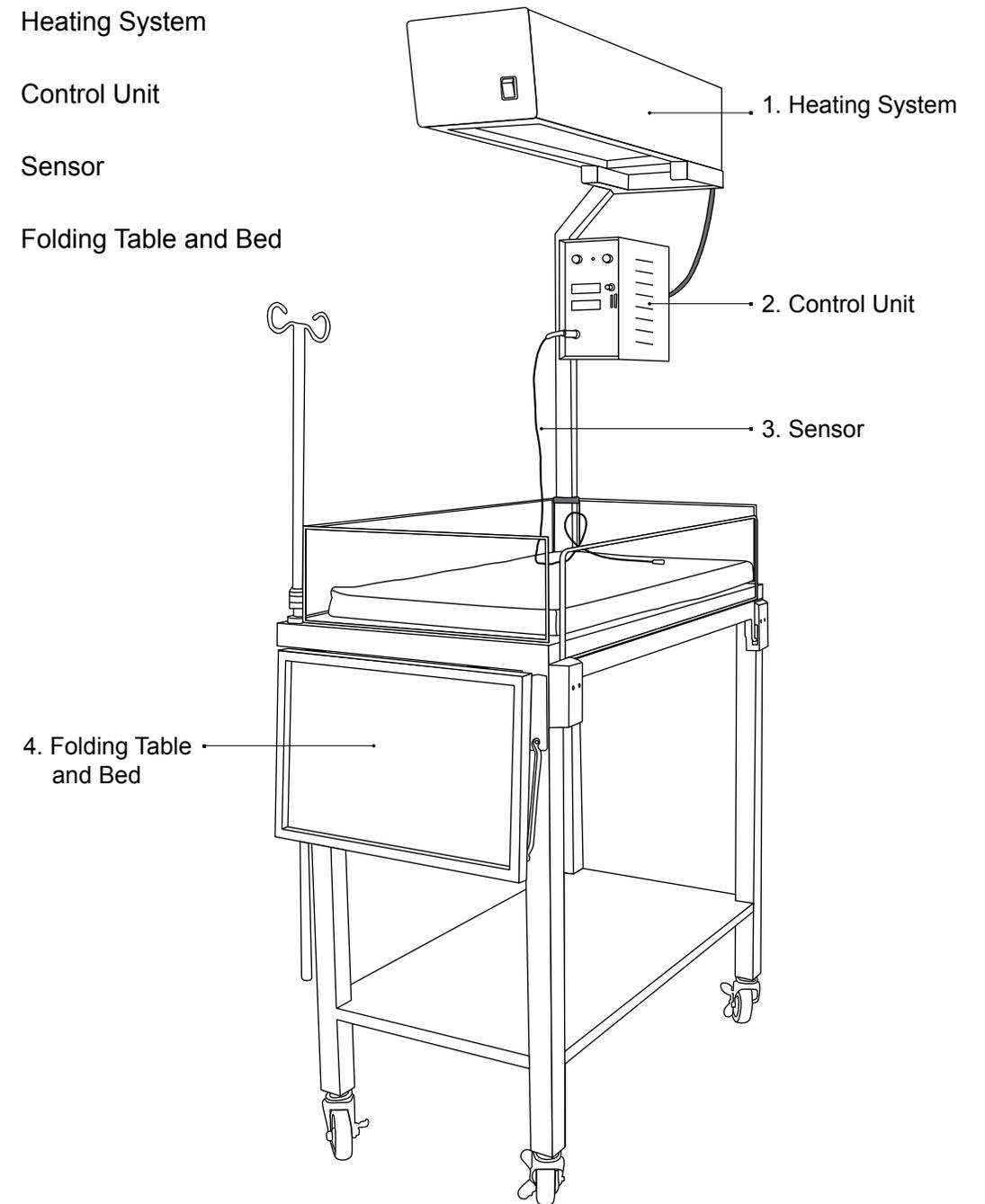
The MTTTS WARMER is designed to keep infants warm in first aid emergencies or medical environments that require an appropriate temperature. It monitors the body temperature of the patient and adjusts the heat according to a desired set temperature.

Before beginning any technical tasks, DO NOT FORGET to engage the brake on the wheels in order to prevent the Warmer from moving. Turn OFF the Warmer and unplug it from 220V.

## Warmer System

The MTTTS Warmer system is composed of:

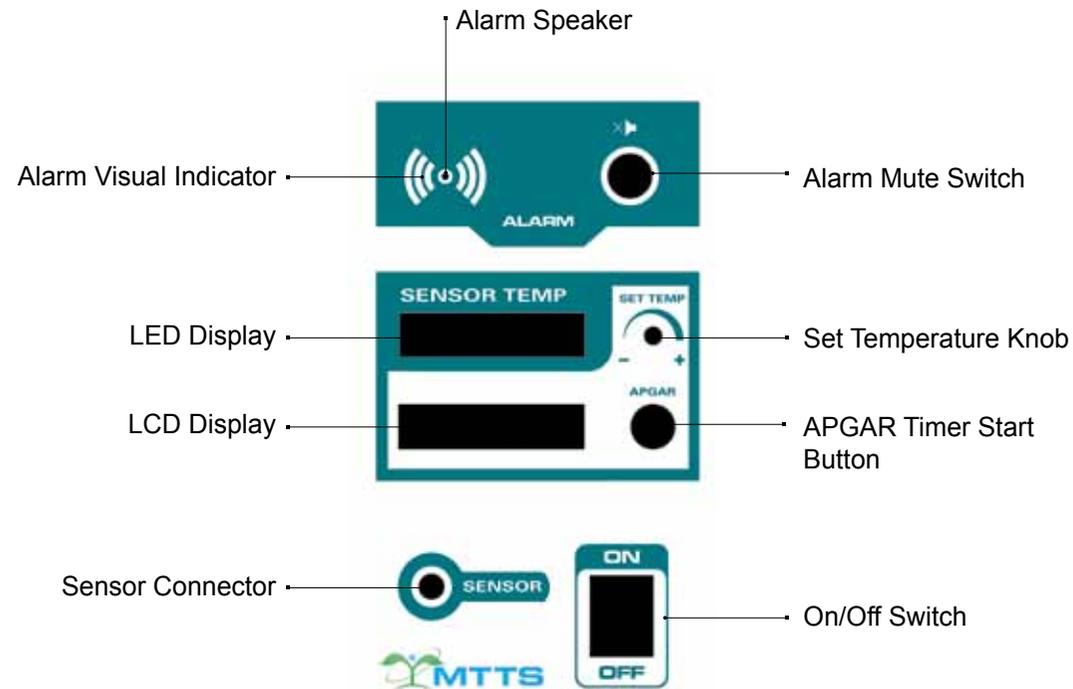
- ① Heating System
- ② Control Unit
- ③ Sensor
- ④ Folding Table and Bed



Pic. 17

## Control Unit

### Control Unit



Pic. 18

### OPERATING PRINCIPLE:

The control unit is used to control all the functions of the Warmer. It also provides the user with visual displays describing Warmer operating conditions.

#### Front of control unit

##### On/Off Switch

Turns the power on/off for the whole warmer.

##### Alarm system:

- Alarm 'speaker': sounds when there is an alarm condition.
- Alarm button: light flashes when an alarm condition exists. Pressing this button turns the alarm speaker/audible alarm off for 9 minutes.

##### Sensor Temperature Dial

This dial sets the desired temperature of the baby/warmer mattress. The possible temperature range is 32 – 38°C in 0.1°C increments. It is set by the user. Turning the dial clockwise increases the temperature setting and counterclockwise decreases the temperature setting.

##### Alarm Speaker

When an alarm condition exists, the speaker will sound. An alarm condition will occur when the temperature of the sensor is higher than the set temperature, or if the sensor cannot make an accurate temperature reading.

##### Horizontal LED display

This displays the temperature recorded by the skin sensor (the baby's skin temperature). The sensor has an accuracy of +/- 0.3°C and a range of 19.5-45.8°C.

##### Horizontal LCD display

The top line displays the set temperature dialed by the user (32-38°C) and any relevant messages or warnings. The bottom line displays the APGAR clock after the initial warm-up period.

##### APGAR button

Pressing this button starts the APGAR timer. Alarm indicates after 1 min, 5 min, 10 min, 20 min and 30 min.

##### Sensor connector

Site where the skin temperature sensor is plugged in. Use only MTTs temperature sensors.

#### Back of control unit

##### 220V power inlet

Connect grounded power cord from grounded wall outlet to socket.

Diagnostic buttons

Used by MTTS staff during maintenance.

Fuses

Replaceable safety fuses (5A/250V AC@50A slow blow 5 x 20 mm).

220V heater outlet

Supplies power to heater element.

**PREVENTIVE MAINTENANCE:**

There is no preventive maintenance required for the Control Unit. However, it should be inspected every 6 months by a hospital technician and any failures immediately reported to MTTS.



Pic. 19

# Heating System



Pic. 20

**OPERATING PRINCIPLE:**

This part of the warmer houses the heater element and a halogen light source. The heater element can provide up to 500W and is regulated by the temperature sensor. The heating system is insulated with fibreglass.

A halogen lamp on the warmer provides light for health workers to treat, check and care for the patient. Turn it off after use to conserve the life of the lamp. The halogen lamp is not a light to be used for the treatment of jaundice. A switch on the end of the unit turns the halogen light on and off.

**PREVENTIVE MAINTENANCE:**

**1. Replace Halogen Bulb**

- 1.1. Ensure the entire Warmer is turned off by turning the switch off on the Control Unit.
- 1.2. Wait for the bulb to cool down. Grasp the halogen bulb using your fingertips and pull.
- 1.3. Insert a new bulb. The polarity of the bulb is not important.



Pic. 21

**2. Replace Light Switch**

- 2.1. Remove the 4 screws at the end of the Heating System. (Pic. 22).
- 2.2. Use a sharp knife to remove the heatshrink from the old switch. (Pic. 23).



Pic. 22



Pic. 23

- 2.3. Desolder the wires going to the old switch. (Pic. 24).
- 2.4. Remove old switch. (Pic. 25).



Pic. 24



Pic. 25

- 2.5. Clean up the recently cut wires - cut off wire that has solder on it and strip the insulation. Tin all of the wires.
- 2.6. Insert a new switch. Make sure the '1' symbol is at the top.

- 2.7. Slide heatshrink onto all wires about to be soldered.
- 2.8. Solder wires to the switch. Make sure you solder to a vertical pair of pins on the switch - the polarity doesn't matter.
- 2.9. Slide the heatshrink into the correct position and use a heat gun to shrink the heatshrink around the connection. (Pic. 26).
- 2.10. Replace the cover plate using 4 screws.



Pic. 26

## Temperature Sensor

### Operating Principle:

The temperature sensor measures the temperature of whatever it is attached to.

### Preventive Maintenance:

There is no preventive maintenance required for the Temperature Sensor. However, it should be inspected every 6 months by a hospital technician and any failures immediately reported to MTTTS.

## Folding Table and Bed

### Operating Principle:

The Bed is used to provide a location for the baby to receive treatment by the Warmer. The folding bed is used as a convenient location to put equipment or miscellaneous items.

### Preventive Maintenance:

There is no preventive maintenance required for the folding table and bed. However, every 6 months the folding table should be inspected by raising and lowering the folding bed to ensure it moves easily and locks into the upright position securely. Check that the side panels of the bed can be moved up and down easily. Any failures should be immediately reported to MTTTS.

## Troubleshooting

The heater element never seems to warm up

- If the set temperature is below the ambient temperature the heater element will not turn on. The warmer is working properly.
- Ensure the cable from the control unit to the heating system is not damaged and is connected properly. If the problem persists, please call MTTTS for service.

The displays on the control unit do not illuminate

- Ensure the power cable to the control unit is not damaged and is connected properly.

The display is showing garbage information

- Try resetting the machine by turning the power off and back on again. **If the problem persists, please call MTTTS for service.**

The alarms do not stop

- If the “Temp too low !” or “Temp too high !” alarms is on, it means that the sensor temperature is out of range from the set temperature. To test this, move the sensor closer/farther from the heater so that it can become with +/- 1° of the set point. If the alarm stops, then the warmer is working properly. If the alarm continues, call MTTTS for service.
- If the “Sensor failure !” alarm is on, this means that the skinsensor is unplugged or it is broken. Plug the sensor back in if it is unplugged. If the sensor is plugged in and the screen still reads “Sensor failure !”, this means the sensor is broken. Replace the sensor.
- If the “Sensor off baby!” alarm is on, this means that the baby sensor is suspected to not be on the baby. Place the sensor on the baby and wait 5 minutes. If the alarm does not turn off automatically, restart the warmer. If problem persists, call MTTTS for assistance.
- If the “Amb.Sensor fail!” alarm is on, this means that the ambient temperature sensors are not functioning properly. Call MTTTS for assistance.

The warmer system is hot to touch

- The warmer system is usually warm to touch, however, if it becomes too hot, open the warmer system and check a) that there is enough insulation and b) that it has been placed correctly.
- If the problem persists, discontinue use and call MTTTS for service.

There is smoke or a burning smell coming from the warmer

- Immediately turn off the warmer.
- Open the warmer system and check to see if any wires look burnt. If so, replace them. Make sure that the insulation is inserted correctly (see instructions).
- If the problem persists, discontinue use and call MTTTS for service.

When any metal on the warmer is touched, one can feel a tingling sensation

- This can be caused by inadequate earthing of the warmer. Make sure that the power cable from the wall to the control unit has an earth pin (there should be 3 pins). Try a different 3-pin cable to test if it is damaged.
- Ensure the power cable is connected securely.
- Some hospitals do not have an adequate earth connection. If you continue to notice a tingling sensation, switch off the warmer immediately, discontinue use, and call MTTTS for service.

The warmer is uneven on the ground.

- There is a hexagonal nut just above each wheel - turn one of these nuts to change the height of the leg.

The warmer seems too hot/cold.

It is very difficult to determine if the warmer is at the right temperature using your senses. Your perception of temperature can change depending on your health, your mood, ambient environmental conditions, amongst many other things. If you suspect the warmer is not at the right temperature, place a thermometer in the centre of the bed and set the warmer temperature to be 4 degrees above the ambient temperature. If, after 10 minutes, the thermometer is not within 2 degrees of the set temperature then the warmer must be recalibrated. Please call MTTTS for this to occur. Note that the warmer can only raise the temperature. If the set temperature is below the ambient temperature, the heating system will not operate.



**MEDICAL TECHNOLOGY TRANSFER AND SERVICES**

No 26 - Lane 41 - An Duong Vuong, Ho Tay, Hanoi, Vietnam

Tel: + 84 24 3766 6521

Fax: + 84 24 3718 8050

Email: [assistance@mtts-asia.com](mailto:assistance@mtts-asia.com)

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

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**WARMER V1-V3 SERIES REV 2.01**