GE Healthcare

Giraffe® Blue Spot PT Lite™

Operation, Maintenance, and Service Manual

Warranty

This product is sold by GE Healthcare with a period of 12-month of GE depot repair warranty that covers labor and parts (except for the LED Module assembly which has a 24-month warranty and the expendable parts like fan which have a 30-day warranty) under the terms and conditions set forth in the GE Healthcare Warranty Statement presented to the customer at the point of sale.

The product warranty is only offered through GE service depot. Field service is not covered under warranty for this product.

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Scope and Intended Users

This operation, maintenance, and service manual describes how to use, maintain, and service the Giraffe Blue Spot PT Lite Phototherapy System. This manual has two parts, one for Operation and Maintenance and one for Service.

The intended users for the Operation and Maintenance part of this manual are end users of the equipment, primarily care providers in the hospital setting. The intended users for the Service part of this manual are hospital biomedical engineering services and GE Service personnel.

This device should only be operated by personnel trained in its operation and familiar with the risks and benefits of this type of device.

Conventions

Various types of pictures or icons are used in this manual wherever they reinforce the printed message to alert you to potential safety hazards in one of the following ways:

	**WARNING:** A WARNING statement is used when the possibility of injury to the patient or the operator exists.
	**CAUTION:** A CAUTION statement is used when the possibility of damage to the equipment exists.
	**SENSITIVE TO ELECTROSTATIC DISCHARGE CAUTION** An Electrostatic Discharge (ESD) Susceptibility symbol is displayed to alert service personnel that the part(s) are sensitive to electrostatic discharge and that static control procedures must be used to prevent damage to the equipment.

User Responsibility

This Product will perform in conformity with the description thereof contained in this operating manual and accompanying labels and/or inserts, when assembled, operated, maintained and repaired in accordance with the instructions provided. This Product must be checked periodically. A defective Product should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, GE Healthcare recommends that a telephone or written request for service advice be made to the nearest GE Healthcare Regional Service Center. This Product or any of its parts should not be repaired other than in accordance with written instructions provided by GE Healthcare and by GE Healthcare trained personnel. The Product must not be altered without the prior written approval of GE Healthcare's Quality Assurance Department. The user of this Product shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage, or alteration by anyone other than GE Healthcare.

WARNING:
No modification of this device is allowed.

CAUTION:

U.S Federal law restricts this device to sale by or on the order of a licensed medical practitioner.

Part I: Operation and Maintenance

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Important Operation Safety Information

WARNING:
Do not use the Giraffe Blue Spot PT Lite in the presence of flammable anesthetics (e.g. ether) mixture with air or with oxygen or nitrous oxide which can support combustion; a possible explosion hazard exists under these conditions.

WARNING:
Blue light can hinder clinical observations by masking skin color changes, such as cyanosis.

WARNING:
Do not block the power cord plug. It may be needed for emergency power shutoff.

WARNING:
Prolonged exposure to any phototherapy light may cause eye damage. Prolonged stay in the area irradiated by the phototherapy equipment may cause some effects on the operator. Never look directly at the light. Infants should wear eye protection during therapy. Take care to protect the eyes of infants adjacent to the treatment area.

WARNING:
Regularly measure the bilirubin levels of infants receiving phototherapy according to hospital policy and procedure.

WARNING:
All phototherapy methods have possible risks including, but not limited to bronze baby syndrome, diarrhea (loose green stool), hyperpigmentation-reddening, skin blistering (oxidative tissue damage), skin irritation(rashes), water loss, and dehydration. Monitor the baby closely for signs of these conditions during phototherapy.

WARNING:
Bilirubin photoisomers may cause toxic effects.

WARNING:
Porphyrins are by-products of the photochemical break down of the bilirubin molecule. In some cases, exposure of porphyrins to phototherapy may result in localized reddening of the infant's skin. Therefore, skin assessment is indicated with all types of phototherapy.

WARNING:
Take appropriate measures to maintain the patient's fluid balance while administering phototherapy.

WARNING:
To avoid patient injury, do not mount the system while a patient occupies the bed.

WARNING:
To avoid the risk of electrical shock, the system must only be connected to a supply mains with protective earth.

WARNING:
Light can adversely affect drugs and other infusion liquids. When using intravenous delivery systems during phototherapy, shield any tubing with appropriate material. Do not store drugs or infusion liquids directly in the light path.

WARNING:
When using the device with a radiant warmer, make sure the light shade is not directly in the path of the radiant heat rays. If the light shade is in the path, it will block heat to the patient and may damage the light shade.

WARNING:
It is recommended to set the incubator or warmer in baby controlled (servo) mode when these devices are used with phototherapy light. Always monitor the infant's temperature and make the appropriate adjustments to avoid temperature fluctuations during phototherapy.

WARNING:
Phototherapy light can affect the temperature in the thermoregulation devices (incubators, radiant warmers or heated mattresses) and may raise the patient's body temperature. Always monitor the infant's temperature and make the appropriate adjustments to these devices to avoid temperature fluctuations during phototherapy.

WARNING:
Using reflective foils to increase the efficacy of phototherapy may cause hazardous patient body temperatures.

WARNING:
Oxygen enriched environments greatly reduce the temperature at which materials burn. Be extremely careful to remove all opaque materials from the immediate light path when using the light while administering oxygen.

WARNING:
If the system is mounted on a portable roll stand, lock the wheels to prevent movement of the device during the therapy.

WARNING:
The power cord presents a trip hazard. Do not leave the cord unattended when located in traffic areas.

WARNING:
Periodically check that the patient is in the treatment area of the device.

WARNING:
Follow hospital policy and procedure for bilirubin, temperature, skin and eye assessments during use of phototherapy.

WARNING:
Never use flammable cleaning solutions to clean the Giraffe Blue Spot PT Lite.

CAUTION:
Service this product in accordance with the service manual only with the proper tools, test equipment and the most recent revision of the service manual, which is clearly and thoroughly understood.

CAUTION:
To avoid the device overheating, do not block any of the vents on the light box.

CAUTION:
Do not place opaque objects in the direct light path. Light energy can cause heating and damage to nontransparent materials.

CAUTION:
Only use GE Healthcare approved spare parts.

Contraindications

Contraindications to phototherapy*:

- Congenital porphyria or family history of porphyria
- Concomitant use of drugs or agents that are photosensitive
- Concurrent therapy with metalloporphyrin heme oxygenase inhibitors

Phototherapy effectiveness may be decreased in presence of cholestasis (direct hyperbilirubinemia).

* MacDonald & Ramasethu (2007). Atlas of Procedures in Neonatology, Lippincott Williams & Wilkins, Philadelphia, PA

Symbol Definitions

This section identifies the symbols that are displayed on the Giraffe Blue Spot PT Lite Phototherapy System:

Symbol	Description
	Consult accompanying documents.
	Do not place the Giraffe Blue Spot PT Lite in the path of radiant heat from another device.
	High voltage, electrical shock hazard
~	Indicates alternating current
EC REP	European Union Representative
	Hour meter display
	Standby/on switch
	Cover infant's eyes during phototherapy.
	Over-temperature / under-temperature condition

Symbol	Description
	Potential equalization stud
	Recommended distance from the light shade to the patient
	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as an unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

Chapter 1: Product Overview

1.1 Intended Use

The GE Healthcare Giraffe® Blue Spot PT Lite™ Phototherapy System provides light therapy for the treatment of hyperbilirubinemia, commonly known as neonatal jaundice, during the newborn period in the hospital.

This therapy is to be administered by trained, professional medical staff, on the order of a licensed medical practitioner.

1.2 Product Description

An LED provides the therapeutic light source. A fan cools the LED and extends LED life.

As soon as the device is connected to a power outlet, it is ready for use. A standby/on switch on the front of the device turns the therapeutic light on and off.

Located near the switch, a non-resettable hour meter display shows how long the device has been emitting therapeutic light during the life of the product. Below the hour meter display, a green indicator lights when the device is on standby, a blue indicator lights when the device is emitting therapeutic light, and a red indicator will flash if the fan fails to operate correctly or the device overheats. The red indicator will illuminate continuously, while the fan operates, if the device is too cold. The fan will operate in an attempt to cool, or warm, the system into the proper operating temperature.

Underneath, on the base of the device are the IEC power inlet, two fuses, potential equalization stud, and the fan filter retainer. A mounting bracket on the back of the device allows the device to be positioned and secured in the dovetail slot of an accessory rail. It can be mounted on any GE Healthcare system with dovetail rails. Tightening two socket head mounting screws holds the device in position.

The light intensity delivered to the patient varies directly with the distance of the light shade from the mattress. The intensity and spot size can be changed by manually adjusting this distance. The flexible light pipe bends to a new position and then holds the light shade in place. The flexible light pipe transmits the light from the LED to the light shade, where it can be directed at the patient.

1.3 Controls, Indicators, and Connections

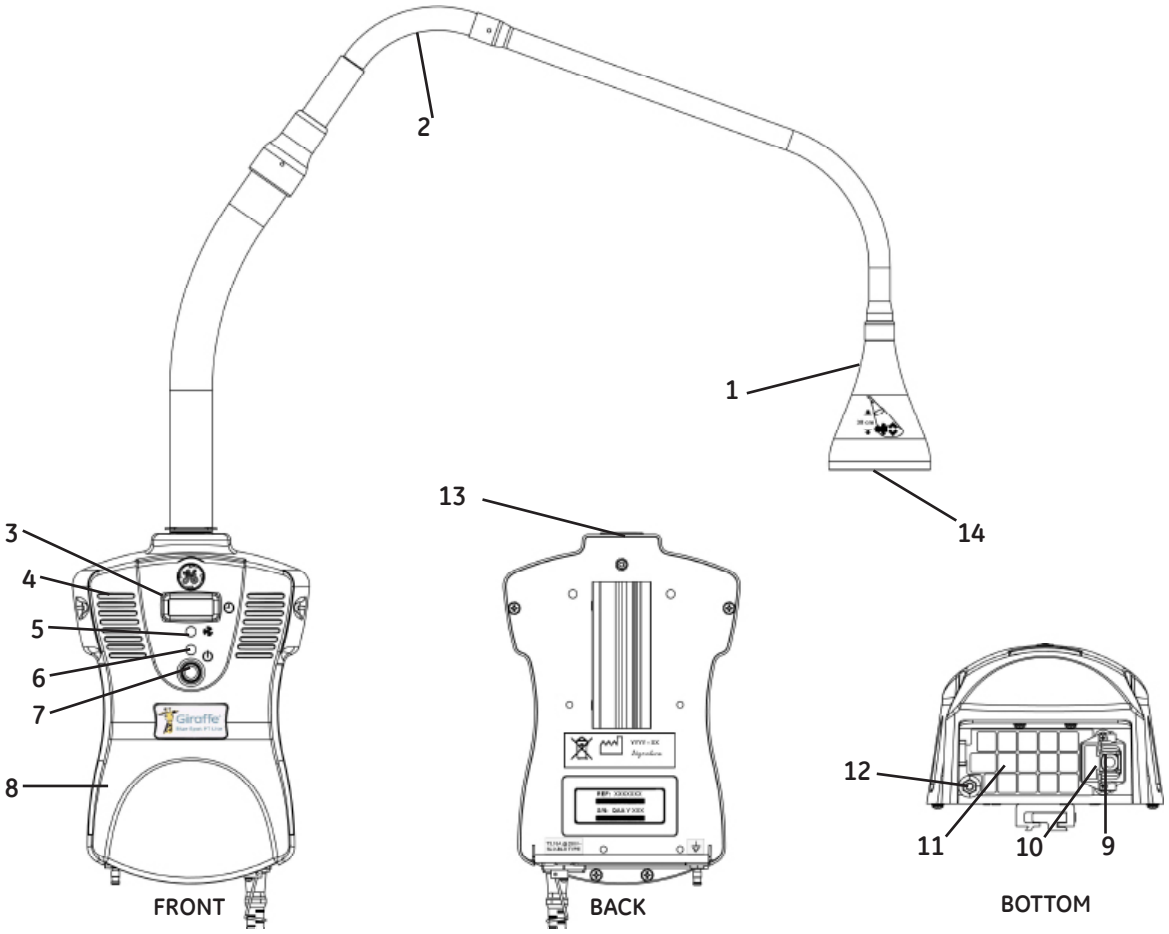

Figure 1-1

1. Light shade
2. Light pipe
3. Hour meter display
4. Exhaust vents
5. Over/under temperature indicator
6. Standby/on indicator
7. Standby/on switch*
8. Light box
9. Power cord inlet*
10. Fuses Compartment
11. Intake vents/air filter
12. Potential equalization stud
13. Light pipe port
14. Light shade protective cover

* To isolate the device from the supply mains:
- For a wall-connected device, unplug the power cord.
- For a device connected to a microenvironment's accessory outlet, switch off the mains switch on the back of the microenvironment.

The following table describes the meaning of each status for each indicator:

Table 1-1: Indicators

Indicator	Status	What it Normally Means
Standby/on indicator	Off	The device has no power.
	Green	The device is in standby and not emitting light.
	Blue	The device is emitting light.
Hour meter display	Off	The device has no power.
	Displaying numbers	The device is in standby or emitting light. The number represents the number of hours the device has been emitting light during the the life of the device.
Over/under temperature indicator	Off	No temperature problems detected.
	Steady red	Under-temperature condition
	Flashing red*	Over-temperature condition

*The over/under temperature red indicator briefly flashes every time the Standby/On switch is depressed to turn on the therapeutic light in order to confirm the function of the alarm indicator.

For operator troubleshooting instructions, refer to Chapter 4.

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Chapter 2: Product Setup and Operation

Upon shipment, the light pipe is detached from the light box. Prior to first use, the light pipe needs to be attached and secured to the light box and then the device needs to be mounted on the dovetail rail of a microenvironment or a portable roll stand.

Installing the device shall be performed by authorized service personnel only. For instructions, refer to section 7.4.

⚠	**WARNING:** To avoid patient injury, do not mount the system while a patient occupies the bed.
⚠	**WARNING:** To avoid the risk of electrical shock, the system must only be connected to a supply mains with protective earth, using the power cord supplied.

2.1 Pre-use Checkout Procedure

Follow below checkout instructions prior to first system use and then before any time the system is put into operation:

1. Examine the device for missing parts or obvious signs of damage, including power cord, light pipe, light box, and labels. If damage is found, do not use the device and contact service personnel.

2. Check that the light box is securely attached to the accessory dovetail rail or roll stand, i.e. the device does not slide up or down the dovetail rail.

3. Move the light pipe to verify that it moves freely and stays in position.

   NOTE: The light pipe will typically experience some minor deflection (less than 1.3cm) after positioning.

4. Connect the power cord to an appropriate power source. The standby/on indicator will light green to indicate standby mode.

5. Press the standby/on switch to turn on the therapeutic light. The standby/on indicator will change from green to blue and the over-temperature/under-temperature indicator will briefly illuminate.

6. Confirm that the fan is operating by momentarily placing your hand close to the exhaust vent when the device is on to feel the air flow coming out of the device.

7. Focus the therapeutic light such that the spot diameter is 35.5 cm (14 in) or the shade is 38 cm (15 in) from the bed surface.

8. Allow the Giraffe Blue Spot Pt Lite to warm-up 5 minutes.

9. Using a calibrated Biliblanket Light Meter II, measure the light at the 5 points indicated in Figure 2-1 and calculate their average. Confirm that the average is at least 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$. If not, refer to symptom OS4 on Chapter 4.

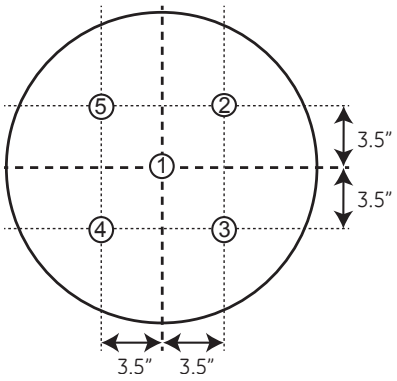


Figure 2-1 Light Measurement Points

10. Divide the lowest reading by the highest reading. If the LED light is functioning properly, the result should be greater than 0.4. If the result is not greater than 0.4, contact service.

NOTE: IEC standards recommend LED module replacement at 25% output reduction, which corresponds to 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$ and occurs at approximately 10000 hours. However, sufficient irradiance for effective phototherapy continues well after 25% reduction

2.2 Operation

WARNING:
Prolonged exposure to any phototherapy light may cause eye damage. Prolonged stay in the area irradiated by the phototherapy equipment may cause some effects on the operator. Never look directly at the light. Infants should wear eye protection during therapy. Take care to protect the eyes of infants adjacent to the treatment area.

WARNING:
Light can adversely affect drugs and other infusion liquids. When using intravenous delivery systems during phototherapy, shield any tubing with appropriate material. Do not store drugs or infusion liquids directly in the light path.

WARNING:
It is recommended to set the incubator or warmer in baby controlled (servo) mode when these devices are used with phototherapy light. Always monitor the infant's temperature and make the appropriate adjustments to avoid temperature fluctuations during phototherapy.

WARNING:
Phototherapy light can affect the temperature in the thermoregulation devices (incubators, radiant warmers or heated mattresses) and may raise the patient's body temperature. Always monitor the infant's temperature and make the appropriate adjustments to these devices to avoid temperature fluctuations during phototherapy.

WARNING:
Using reflective foils to increase the efficacy of phototherapy may cause hazardous patient body temperatures.

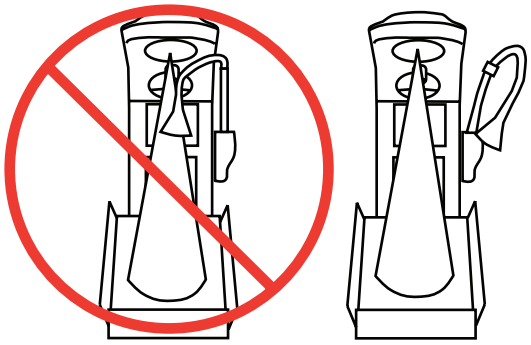
WARNING:
Oxygen enriched environments greatly reduce the temperature at which materials burn. Be extremely careful to remove all opaque materials from the immediate light path when using the light while administering oxygen.

WARNING:
Follow hospital policy and procedure for bilirubin, temperature, skin and eye assessments during use of phototherapy.

CAUTION:
To avoid the device overheating, do not block any of the vents on the light box.

CAUTION:
Do not place opaque objects in the direct light path. Light energy can cause heating and damage to nontransparent materials.

WARNING:
When using the device with a radiant warmer, make sure the light shade is not directly in the path of the radiant heat rays. If the light shade is in the path, it will block heat to the infant and may damage the light shade.



1. Place the infant in the center of the bed mattress.
2. Cover the infant's eyes with eye protection. Clinicians should refer to the instructions for use provided with the specific eye protection being used for proper application and use.
3. Maximize the infant's skin exposure to the therapeutic light. For example, use the smallest size diapers and avoid blanket rolls or positioning aids that block the light source.
4. If the system is mounted on a portable roll stand, lock the wheels to prevent the movement of the device during the therapy.
5. Press the standby/on switch to turn on the therapeutic light.
6. Position the light shade at 38cm from the infant and aim the light towards the infant. The spot diameter will be 35.5cm.
7. Using a calibrated Biliblanket Light Meter II, measure irradiance at the umbilicus when the infant is supine and the lumbar area when the infant is prone.
8. The light shade may be raised to adjust light output and desired surface coverage.
9. Monitor the infant's temperature during phototherapy treatment.
10. Monitor patient's fluid intake and output during phototherapy treatment.

NOTE: For information on the indicators on the system and how to interpret them, refer to “Figure 7-4”.

NOTE: It is recommended to monitor irradiance, according to hospital policy and procedure, during phototherapy .

NOTE: The efficacy of phototherapy depends on the light intensity, patient surface coverage area, distance, and light spectrum of the phototherapy device use.

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Chapter 3: Operator's Maintenance

This chapter includes planned maintenance procedures to be performed by the operator. For planned maintenance procedures to be performed by the hospital biomedical engineering services, refer to "Chapter 8".

3.1 Cleaning and Maintenance

3.1.1 Cleaning Procedure

⚠	**WARNING:** Never use flammable cleaning solutions to clean the Giraffe Blue Spot PT Lite.
⚠	**CAUTION:** Clean the clear protective cover of the light shade with non-flammable optical cleaner and a lint-free soft cloth. If an alcohol solution is used, thoroughly dry the cover to make sure no residual cleaner remains.
⚠	**CAUTION:** Always follow hospital and local regulations for required cleaning and maintenance frequencies.

1. Unplug the power cord and allow the system to cool at least 10 minutes before cleaning.

2. Clean the clear protective cover of the light shade using a non-flammable optical cleaner.

3. Clean the outside of the light box, light pipe and light shade using a cleaning solution listed in section 3.1.2. Aqueous solutions which are both hospital disinfectants and microbactericides may be used. Do not allow liquids to seep into the housing. Apply the cleaning solutions with a clean cloth or sponge. Do not spray cleaner into the vents, since this will contaminate the LED, optics, and electronics.

4. Always dry the parts with a clean damp soft cloth to avoid scratches and remove cleaner residue.

3.1.2 Equipment-safe Cleaning Solutions

The following lists some equipment-safe cleaning solutions:

Generic Formulation	Maximum Concentration
Sodium Hypochlorite (bleach)	0.5% Aqueous Solution
Glutaraldehyde	2%

Generic Formulation	Maximum Concentration
Hydrogen Peroxide	6%
Cavicide®	100% spray (sprayed on a cloth - not directly on the equipment) Active ingredients: Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride (0.28%), Isopropanol (17.20%), inert ingredients (82.54%)
Quaternary Ammonium	0.28%
Isopropyl Alcohol	<15%

Do not use the following cleaners; they will damage the parts you are cleaning and are not recommended:

- Isopropyl Alcohol (in concentrations greater than 15%)
- Solvents (such as acetone)
- Wescodyne

NOTE: Do not soak parts in cleaning solutions. Always wipe parts dry of all cleaning solutions. Following these two recommendations will greatly extend the life of the parts.

NOTE: Any parts cleaned with iodophor solution will stain yellow.

3.1.3 Factors that affect product life

Factor	Description
Thermal stress	Operating without the cooling fan running or operating with clogged filters will reduce LED life.
Light pipe folding or excessive bending	Do not fold or bend the light pipe any tighter than 60 degrees.

NOTE: To maintain optimal fan perfromance, clean or replace filters when they are dirty.

3.1.4 Cleaning or Replacing the Fan Filter

1. Disconnect power to the unit.
2. Remove the filter retainer from the bottom of the unit.
3. Inspect filter (M1225816). Clean by rinsing in water or replace if necessary.
4. Once the filter is dry, return to the bottom of the unit and reinstall the filter retainer.

3.1.5 Product storage

It is recommended to leave the light pipe attached to the light box during product storage. If the light pipe is detached from the light box for storage, the protective caps of the light pipe and the light pipe port (originally supplied with the system shall be applied to the the light pipe and the port to protect the therapeutic-light LED and fiber against dust and dirt.

⚠ **CAUTION:**

Do not fold the light pipe or bend it tighter than 60 degrees to avoid light pipe damage.

3.2 Options

Portable Roll Stand 6600-0894-216
GE Healthcare BiliBlanket Meter II.....6600-0198-900

NOTE: Use only GE approved optional parts with the device.

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Chapter 4: Operator Troubleshooting

This chapter lists possible symptoms as well as the possible causes and solutions that an operator can implement. All other possible symptoms and causes require professional diagnostics (Professional service technicians may refer to Chapter 10).

ID	Symptom Description	Possible Causes	Actions & Solution
OS1	When system is in standby mode (plugged into power outlet and standby/ on switch is not pressed yet), both the standby/on indicator and hour meter display are off. (Normally, when the system is plugged into a power outlet, the standby/on indicator is green and the hour meter display shows an hour number.)	Power cord is not properly connected.	Confirm that the power cord is plugged into the power outlet and power inlet module. Also make sure that the power cord is secured by the retainer clip.
OS2	When the system is plugged into the power outlet, the over/under temperature indicator is illuminated in **steady red**.	The system temperature is low (under-temperature condition).	Make sure the system is being used in the recommended temperature range. Allow the system to warm up to the ambient temperature before switching the system into on mode. (The system fan turns on to help the system warm up. When the system has warmed up to the ambient temperature, the system fan will turn off, the over/under temperature indicator will turn off, and the standby/on will illuminate green. This process may take several minutes.)

ID	Symptom Description	Possible Causes	Actions & Solution
OS3	When the system is plugged into the power outlet, the over/under temperature indicator is illuminated in **flashing red**.	The system temperature is high (over-temperature condition).	Make sure the system is used in the recommended temperature range. Check whether the vents are blocked. Unblock vents if necessary. Check filters. call service to clean or replace if necessary. **NOTE:** Once the air vents are unblocked, the fan will continue to run to cool the LED module. Once the LED module cools, the over/under temperature indicator will also turn off and the standby/on indicator will illuminate green. This process may take several minutes.
OS4	The system generates low light output (less than 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$ on average).	Protective cover of light shade is dirty	Clean the cover gently using cleaning solution and a lint-free wipe.
		Wrong light meter is used for light output measurement.	Make sure that the recommended light meter is used for light output measurement.
		The light shade is farther than 38 cm (15") from the bed surface or not directly aimed at it.	Focus the therapeutic light such that the spot diameter is 35.5 cm (14") or the shade is 38 cm (15") from the bed surface, and the light is aiming at the the bed surface.

Chapter 5: Specifications

5.1 Electrical Specifications

Device type: Class I

- Operation: Continuous operation
- Input Rating: 100-240VAC 50/60 Hz, 130-170VA

Note: To isolate the device from the supply mains:
- For a wall-connected device, unplug the power cord.
- For a device connected to a microenvironment's accessory outlet, switch off the mains switch on the back of the microenvironment.

5.2 Environmental Specifications

5.2.1 Operating Conditions

Ambient Temperature	18 to 30°C
Relative Humidity	10 to 95% non-condensing
Atmospheric Pressure	64 kPa to 106 kPa

- Equipment not suitable for use in presence of flammable anaesthetic mixture with air or with oxygen or nitrous oxide.
- IPX0 - Not protected from water ingress.

5.2.2 Transport and Storage Conditions

(While sealed in shipping packaging)

Temperature	-20 to 60°C
Humidity	0 to 95% non-condensing relative humidity
Pressure	64 kPa to 106 kPa

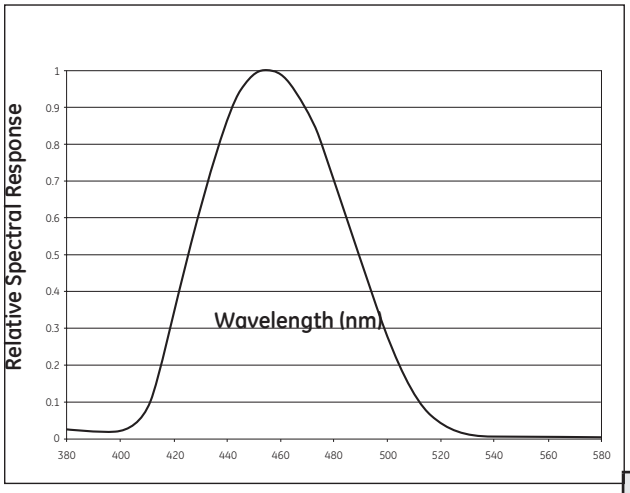
5.3 Performance Specifications

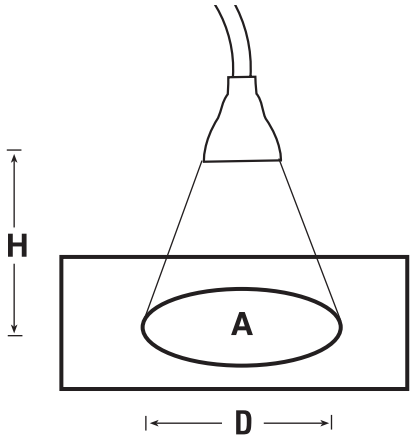
LED life	10000 hours*
Noise level	< 40 dB(A) (measured 90 cm from the system)
Mode of operation:	Continuous
Physical Characteristics	Product (light box and light pipe) size (HxWxD): 26.2 cm x 18.6 cm x 13.9cm Product weight: 4 Kg
Spectral irradiance	45 $\mu W \cdot cm^{-2} \cdot nm^{-1}$ +25% -20% (after a 5 minute warm-up time, and 38 cm from the light shade to the center of the spot with a new system and new LED, measured by a calibrated Biliblanket Light Meter II).
Life Span	The product is designed to meet a life span of 7 years. However, with proper maintenance and repairs, the service life can be extended as long as service parts are available.

* IEC standards recommend LED replacement at 25% output reduction, which occurs at approximately 10000 hours. However, sufficient irradiance for effective phototherapy continues well after 25% reduction.

*AMERICAN ACADEMY OF PEDIATRICS Subcommittee on Hyperbilirubinemia Clinical Practice Guideline: Management of Hyperbilirubinemia in the Newborn Infant > 35 Weeks of Gestation Pediatrics 2004 (July);114:297)

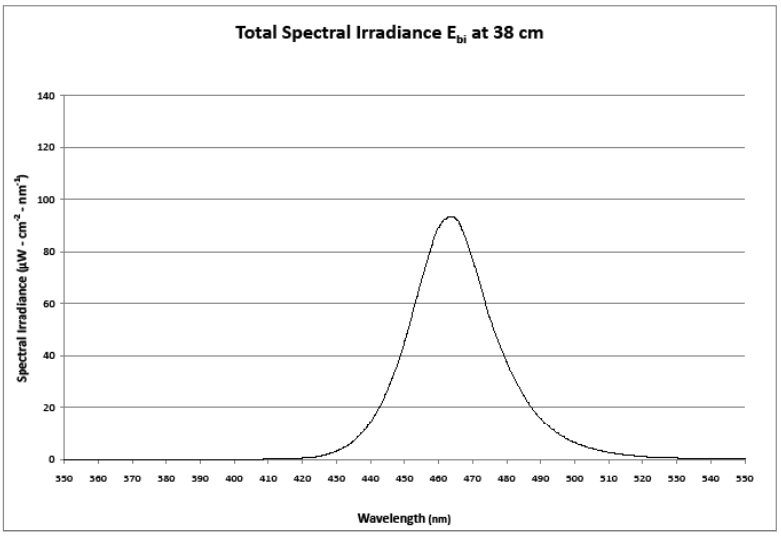
BiliBlanket Meter II Relative Spectral Response

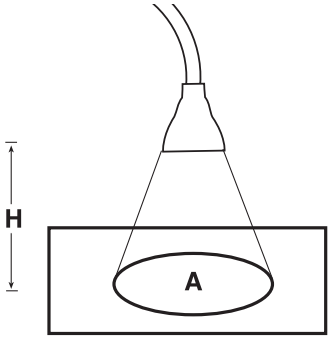




Distance (H cm)	Diameter (D cm)	Surface Area (A cm^2)	Spectral Irradiance ($\mu W \cdot cm^{-2} \cdot nm^{-1}$ +25%, -20%)
38	35.5	990	45
50	46.7	1713	26
60	56.1	2472	18

The following information is provided for compliance to IEC 60601-2-50.





Distance (H cm)	Surface Area (A cm^2)	Average Total Irradiance for Bilirubin (mW · cm^{-2})
38	990	2.94
50	1713	1.70

Total Spectral Irradiance (measured with a spectroradiometer between 400-550 nm).

5.4 Standards

Product complies with the following standards:

- IEC 60601-1-2; UL 60601-1; IEC 60601-1; CAN/CSA C22.2 #60601-1;
- IEC 60601-2-50.

CE 0086

GE Healthcare, a division of General Electric has declared that this product conforms with the European Council Directive 93/42/EEC Medical Device Directive when it is used in accordance with the instructions provided in the Operation and Maintenance Manual.

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Part II: Service

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Important Service Safety Information

The service information presented in Part II is important for the safety of both the patient and operator and also serves to enhance equipment reliability.

WARNING:

Before servicing the Giraffe Blue Spot PT Lite, read through this entire manual. As with all medical equipment, attempting to use this device without a thorough understanding of its operation may result in patient or user injury. This device should be serviced only by authorized service personnel. Additional precautions specific to certain procedures are found in the text of this manual.

The information contained in this service manual pertains only to those models of products which are marketed by GE Healthcare as of the effective date of this manual or the latest revision thereof. This service manual was prepared for exclusive use by GE Healthcare service personnel in light of their training and experience as well as the availability to them of parts, proper tools, and test equipment. Consequently, GE Healthcare provides this service manual to its customers purely as a business convenience and for the customer's general information only without warranty of the results with respect to any application of such information.

Furthermore, because of the wide variety of circumstances under which maintenance and repair activities may be performed and the unique nature of each individual's own experience, capacity, and qualifications, the fact that a customer has received such information from GE Healthcare does not imply in any way that GE Healthcare deems said individual to be qualified to perform any such maintenance or repair service. Moreover, it should not be assumed that every acceptable test and safety procedure or method, precaution, tool, equipment, or device is referred to within, or that abnormal or unusual circumstances may not warrant or suggest different or additional procedures or requirements. This manual is subject to periodic review, update, and revision. Customers are cautioned to obtain and consult the latest revision before undertaking any service of the equipment.

WARNING:

The user or service staff should dispose of all the waste properly as per federal, state, and local waste disposal regulations. Improper disposal could result in personal injury and environmental impact.

Do not use malfunctioning equipment. If the system is under warranty, contact GE technical support at the number on the back of the manual PRIOR to performing any repairs on the system.

WARNING:
This service manual is available in English only.

- If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.
- Do not attempt to service the equipment unless this service manual has been consulted and is understood.
- Failure to heed this warning may result in injury to the service provider, operator, or patient from electric shock, mechanical hazards, or other hazards.

ПРЕДУПРЕЖДЕНИЕ

Това упътване за работа е налично само на английски език.

- Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод.
- Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа.
- Неспазването на това предупреждение може да доведе до нараняване на доставчика на услугата, оператора или пациента в резултат на токов удар, механична или друга опасност.

警告

本维修手册仅提供英文版本。

- 如果客户的维修服务人员需要非英文版本，则客户需自行提供翻译服务。
- 未详细阅读和完全理解本维修手册之前，不得进行维修。
- 忽略本警告可能对维修服务人员、操作人员或患者造成电击、机械伤害或其他形式的伤害。

警告

本服務手冊僅提供英文版本。

- 倘若客戶的服務供應商需要英文以外之服務手冊，客戶有責任提供翻譯服務。
- 除非已參閱本服務手冊及明白其內容，否則切勿嘗試維修設備。
- 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他的危險。

警告

本維修手冊僅有英文版。

- 若客戶的維修廠商需要英文版以外的語言，應由客戶自行提供翻譯服務。
- 請勿試圖維修本設備，除非 您已查閱並瞭解本維修手冊。
- 若未留意本警告，可能導致維修廠商、操作員或病患因觸電、機械或其他危險而受傷。

UPOZORENJE

Ovaj servisni priručnik dostupan je na engleskom jeziku.

- Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod.
- Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik.
- Zanemarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.

VÝSTRAHA

Tento provozní návod existuje pouze v anglickém jazyce.

- V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka.
- Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah.
- V případě nedodržování této výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.

ADVARSEL

Denne servicemanual findes kun på engelsk.

- Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse.
- Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual.
- Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.

WAARSCHUWING

Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.

- Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan.
- Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is.
- Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.

HOIATUS

See teenindusjuhend on saadaval ainult inglise keeles

- Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest.
- Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist.
- Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.

VAROITUS

Tämä huolto-ohje on saatavilla vain englanniksi.

- Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla.
- Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen.
- Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.

ATTENTION

Ce manuel d'installation et de maintenance est disponible uniquement en anglais.

- Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire.
- Ne pas tenter d'intervenir sur les équipements tant que ce manuel d'installation et de maintenance n'a pas été consulté et compris.
- Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.

WARNUNG

Diese Serviceanleitung existiert nur in englischer Sprache.

- Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen.
- Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben.
- Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ

Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.

- Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης.
- Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις.
- Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.

FIGYELMEZTETÉS

Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.

- Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése.
- Ne próbálja elkezdeni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték.
- Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.

AÐVÖRUN

Þessi þjónustuhandbók er aðeins fáanleg á ensku.

- Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálaþjónustu.
- Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin.
- Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.

AVVERTENZA

Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.

- Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.
- Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.
- Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.

警告

このサービスマニュアルには英語版しかありません。

- **サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。**
- **このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないでください。**
- **この警告に従わない場合、サービスを担当される方、操作員あるいは患者 さんが、感電や機械的又はその他の危険により負傷する可能性があります。**

경고

본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.

- 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.
- 본 서비스 매뉴얼을 참조하여 숙지하지 않은 이상 해당 장비를 수리하려고 시도하지 마십시오.
- 본 경고 사항에 유의하지 않으면 전기 쇼크, 기계적 위험, 또는 기타 위험으로 인해 서비스 제공자, 사용자 또는 환자에게 부상을 입힐 수 있습니다.

BRĪDINĀJUMS

Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.

- Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu.
- Neveiciet aprīkojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas.
- Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.

ĮSPĖJIMAS

Šis eksploatavimo vadovas yra tik anglų kalba.

- Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas.
- Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo.
- Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.

ADVARSEL

Denne servicehåndboken finnes bare på engelsk.

- Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse.
- Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått.
- Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.

OSTRZEŻENIE

Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.

- Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta.
- Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go.
- Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.

AVISO

Este manual de assistência técnica encontra-se disponível unicamente em inglês.

- Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução.
- Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.
- A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.

ATENÇÃO

Este manual de assistência técnica só se encontra disponível em inglês.

- Se qualquer outro serviço de assistência técnica solicitar este manual noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução.
- Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.
- O não cumprimento deste aviso pode colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.

ATENȚIE

Acest manual de service este disponibil doar în limba engleză.

- Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere.
- Nu încercați să reparați echipamentul decât ulterior consultării şi înțelegerii acestui manual de service.
- Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.

ОСТОРОЖНО!

Данное руководство по техническому обслуживанию представлено только на английском языке.

- Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует самостоятельно обеспечить перевод.
- Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения.
- Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.

UPOZORENJE

Ovo servisno uputstvo je dostupno samo na engleskom jeziku.

- Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge.
- Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.
- Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.

UPOZORNENIE

Tento návod na obsluhu je k dispozícii len v angličtine.

- Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.
- Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obluhu a neporozumiete mu.
- Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.

ATENCION

Este manual de servicio sólo existe en inglés.

- Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual.
- No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio.
- La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.

VARNING

Den här servicehandboken finns bara tillgänglig på engelska.

- Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster.
- Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken.
- Om du inte tar hänsyn till den här varningen kan det resultera i skador på serviceteknikern, operatören eller patienten till följd av elektriska stötar, mekaniska faror eller andra faror

DİKKAT

Bu servis kılavuzunun sadece ingilizcesi mevcuttur.

- Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer.
- Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.
- Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

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Chapter 6: System Description

The Giraffe Blue Spot PT Lite is a medical device designed to treat neonatal jaundice by providing blue therapeutic light to patients. White light is comprised of light wavelengths from throughout the spectrum. However, the wavelengths of light that actually provide therapy reside only between 410 and 460 nanometers. This light appears blue to the eye and is the specific output of the Giraffe Blue Spot PT Lite.

The system is composed of a light box generating light and a light pipe through which the light from the LED is transmitted and projected upon patients.

1. Light box: The light box functions as the light generator, user control panel, and the device mounting structure through use of a dovetail clamp. The light box contains the following major components:

Component	Description
Therapeutic-light LED assembly	The therapeutic-light LED is mounted directly to a fan-cooled heat sink and also has a built-in thermistor output which is used to produce the temperature fault alarms. The thermistor signal is first conditioned by the LED driver board and then routed to the control board. The LED assembly contains a reflector which serves to narrow and direct the output LED light into the light pipe. A 12 VDC brushless fan is mounted to the heat sink. The fan pulls air from the lower chamber through a dividing baffle. The baffle ensures that the heat sink exhaust heat is directed to the exhaust vents to prevent recirculation. The fan is installed in a certain position to pull air from the lower chamber (cool zone) to the upper chamber (hot zone). Backward installation of the fan causes reverse air flow from hot zone to cool zone and negatively impacts the heat sink cooling. During over-temperature/under-temperature conditions, the fan keeps running to bring the LED assembly temperature to the ambient temperature.
LED driver board	This board generates a 5 VDC supply for powering therapeutic-light LED and control board and routes the 12 VDC supply to the cooling fan. The driver board is set in the factory such that sufficient driver current for the therapeutic-light LED is provided. The voltage and current to the therapeutic-light LED are factory-sealed and non-adjustable in the field. Therefore, the LED driver board and the therapeutic-light LED assembly shall always be replaced in pair with a new factory-set pair (Mixing and matching is not allowed.).
Control board	The control board is mounted to the inside of the unit cover and provides the system controls, indicator LEDs, hour meter display, standby/on switch, and user interface. The control board 5 VDC supply is provided by the LED driver board. The control board sends the commands to the LED driver board to operate the therapeutic-light LED and the fan. The control board includes the hour meter display which shows the total time the therapeutic-light LED is illuminated. The hour meter is not resettable. Therefore, new product units ship with readings other than zero from the factory because of production tests. The hour meter illuminates whenever the AC power is provided to the system.

Component	Description
User interface indicators	Colored indicators on the front face of the system provide information as to the device status. The standby/on indicator is illuminated in green whenever AC Power is applied and the system is in standby mode indicating there are no alarms/faults and the system is ready to operate. When the standby/on switch is briefly depressed to activate the system and turn light on, the standby/on indicator turns blue and the over-temperature/under-temperature red indicator briefly illuminates to indicate that it functions. Turning off the light is controlled in the same fashion by pressing the standby/on switch to put the system in standby mode. The standby/on indicator turns green. The over-temperature/under-temperature indicator provides alarm indications for both internal over-temperature and under-temperature conditions. The temperature limits are factory set and non-adjustable. If the temperature limits are reached, the therapeutic-light LED is automatically turned off but the internal fan continues to operate during the fault conditions in order to bring the internal temperatures back to normal operating conditions. Once the temperature is within the normal range, the fan turns off and the standby/on indicator turns green signifying that the device is ready for operation. The over-temperature/under-temperature indicator is on continuously during under-temperature conditions and flashes repeatedly during over-temperature conditions.
Power supply board	The system includes a universal switching power supply board that can accept AC input voltages in the range of 90-264 VAC at frequency range of 47-63 Hz to generate 12 VDC output that feeds the LED driver board.
Power input connection and fuses	The power cord connects to the input power connector located on the bottom of the device. This input power connector provides EMI protection and also houses two AC line fuses (T3.15A @ 250V~, slo-blo type) which are accessible from the outside of the system unit.

2. Light pipe: The light pipe provides a stable self-supporting, adjustable arm that allows easy, low-force positioning of the light onto the patient. It also allows for easy unobstructed access for the operator to the patient. The light pipe contains optical components; therefore it should be treated with extreme care as damaging these components can severely diminish the light output. The light pipe contains an internal fiber that is used to transmit the light generated by the light box out to the light shade. The light shade includes an output reflector which serves to uniformly project the light over a desired area. The shade also includes a protective cover which serves to enclose the output reflector, protecting it from dust and debris while simultaneously protecting users from touching the fiber end. If needed, the protective cover can be cleaned gently using an optical cleaner and a lint-free wipe.

Chapter 7: Installation

This chapter provides information required to prepare for and perform installation of the Giraffe Blue Spot PT Lite.

Upon shipment, the light pipe is detached from the light box. Prior to first use, the light pipe needs to be attached and secured to the light box as described in section 7.4.1.

7.1 Time Required for Installation

The average installation time for the Giraffe Blue Spot PT Lite is about 5 minutes. The required checkout procedures after installation take approximately 20 minutes.

7.2 Environmental Requirements

The system shall be installed, serviced, and operated within the environmental conditions described in section 5.2.

7.3 Tool Requirements

The hex key provided with the system (No other tools are required).

7.4 Installation Procedure

7.4.1 Light Pipe Attachment

1. Make sure that the system is unplugged from the power outlet.

2. Use the provided hex key to remove the top mounting screw on the back plate (Refer to Figure 7-1).

3. Remove the plastic protective caps of the light pipe and the light pipe port. Remove the plastic protective sleeve of the light pipe mounting clip.

4. Insert the light pipe tip into the light pipe port until the clip is aligned to the top mounting screw hole (Refer to Figure 7-2).

5. Use the hex key to reinstall the top mounting screw.

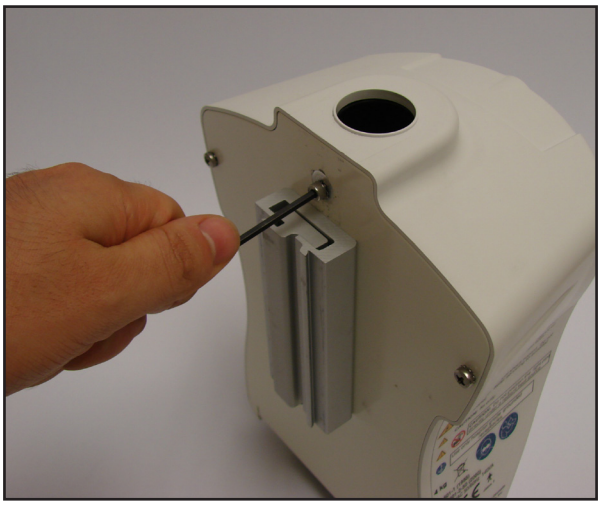

Figure 7-1

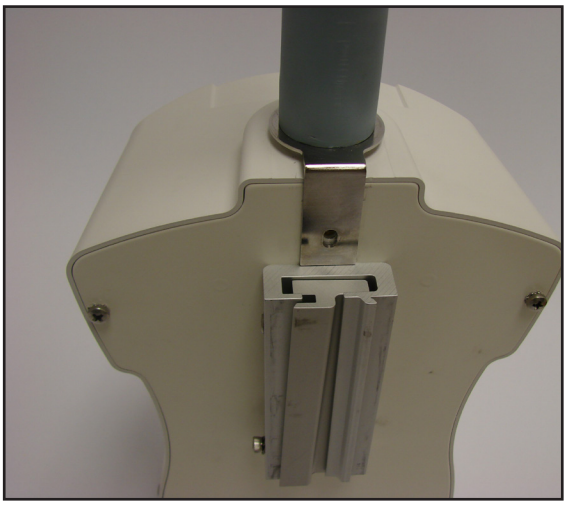

Figure 7-2

7.4.2 Mounting the System

WARNING:
To avoid patient injury, do not mount the system while a patient occupies the bed.

1. Make sure the light pipe is securely attached to the system as instructed in section 7.4.1.

2. Use the provided hex key to loosen the two mounting screws on the side of the dovetail mount bracket (Refer to Figure 7-3).

3. Position the system on the accessory dovetail rail.

4. Secure the system to the dovetail rail by using the hex key to tighten the two mounting screws (Refer to Figure 7-4).

   Note: If you intend to plug the power cord into an accessory outlet on a microenvironment, refer to the microenvironment manual for proper power cord connection.

5. Plug the power cord into the power inlet connector and rotate the retainer to grip and secure the power cord and then plug it into the power outlet.

   NOTE: If you intend to plug the power cord into an accessory outlet on a microenvironment, refer to the microenvironment manual for proper power cord connection.

6. Before use, follow the checkout procedures as described in Chapter 8.

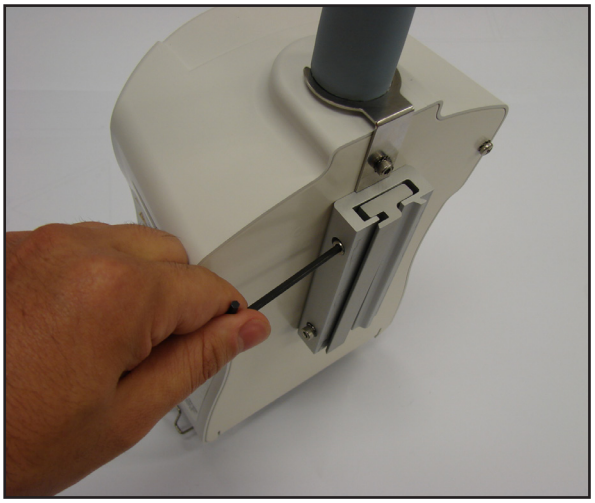

Figure 7-3

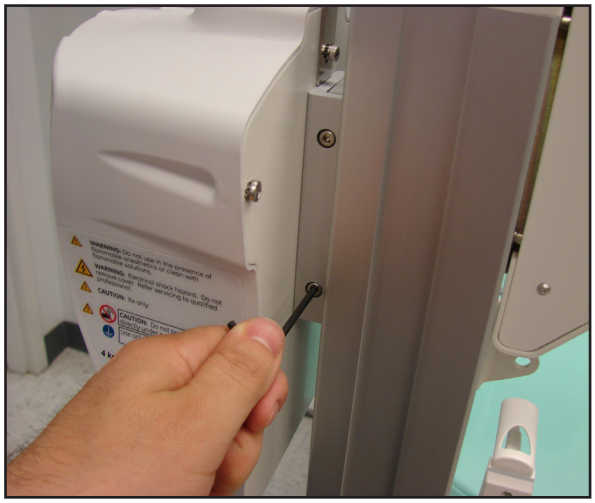

Figure 7-4

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Chapter 8: Service Maintenance and Checkout

This chapter includes planned maintenance procedures as well as checkout procedures required after Giraffe Blue Spot PT Lite installation, repair, or corrective maintenance. These procedures must be performed by authorized service personnel.

8.1 Procedures Schedule

The following table lists all maintenance and checkout procedures, specifies when and how often each procedure should be performed, and provides the average time that it takes to perform each procedure.

Table 8-1: Procedures Schedule

Checkout Procedure Name	Average Time (in Minutes)	Performed as Planned Maintenance	Performed as Checkout after any Service*
"8.4.1 Visual Inspection"	5	Annually	Yes
"8.4.2 Functional Checks"	5	Annually	Yes
"8.4.3 Light Intensity Check"	5	Annually	Yes
"8.4.4 Electrical Safety Tests"	5	Annually	Yes

* Service includes installation, repair, maintenance, or part replacement.

WARNING:
Do not service the Giraffe Blue Spot PT Lite while it is in clinical use, or attached to a warmer or incubator with a patient in the bed.

CAUTION:
Table 8-1 shows the minimum frequencies required for maintenance. Always follow hospital and local regulations for required frequencies.

8.2 Environmental Requirements

The system shall be serviced and operated within the environmental conditions described in section 5.2.

8.3 Tool Requirements

The following table lists the service tools required to perform the planned maintenance and checkout procedures:

Table 8-2: Tool Requirements

Checkout Procedure Name	Service Tools Needed	Quantity Needed
"8.4.1 Visual Inspection"	None	NA
"8.4.2 Functional Checks"	None	NA
"8.4.3 Light Intensity Check"	BiliBlanket Light Meter II (6600-0198-900), Tape measure	1
"8.4.4 Electrical Safety Tests"	Safety analyzer	1

8.4 Maintenance and Checkout Procedures

NOTE: For instructions on cleaning the unit cover, refer to Chapter 3.

8.4.1 Visual Inspection

1. Disconnect the power cord from the power outlet.

2. Examine the power cord for any signs of damage. Replace the cord if damage is evident and perform electrical safety test as instructed in section 8.4.4.

3. Check that the power cord retainer is in place.

4. Examine the system overall for any damaged (cracked or broken) or missing parts, such as the plastic unit cover, standby/on switch, standby/on indicator, over/under temperature indicator, hour meter display, light pipe, light shade, air filter guard, or potential equalization stud. If any part is damaged or missing, replace it (Refer to Chapter 11).

5. Examine the air filter for damage or dust. Replace if necessary.

6. Examine the system for any missing or damaged labels. For a list of labels, and for the proper location of each label, refer to section 12.2.

7. For units on portable roll stand, examine the roll stand for any damaged or missing parts. Check the wheel locks of the roll stand and confirm that they are functional.

8.4.2 Functional Checks

1. Move the light pipe to verify that it moves freely and stays in position.

   NOTE: The light pipe will typically experience some minor deflection (less than 1.3cm) after positioning.

2. Plug the power cord into the power outlet. Confirm that the hour meter display turns on and the standby/on indicator illuminates in green.

3. Press and release the standby/on switch, and confirm the over-temperature/under-temperature red indicator flashes briefly and the standby/on indicator changes to blue.

4. Confirm that the fan is operating by momentarily placing your hand close to the exhaust vent when the device is on to feel the air flow coming out of the device.

5. Confirm that the therapeutic light is on.

WARNING:
Never look directly at the light. Exposure can cause eye damage.

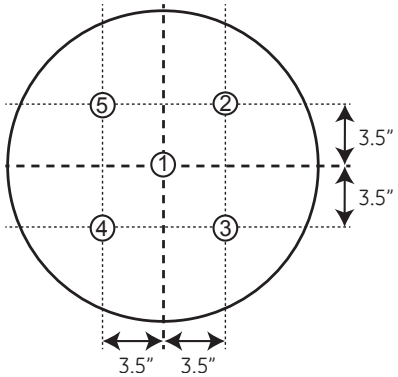
8.4.3 Light Intensity Check

In order to ensure uniform light distribution and the performance of all the optical components, perform the following procedure.

1. Turn on the system.

2. Focus the light so that the spot diameter is 35.5 cm (14”) or when the shade is 38 cm (15”) from the bed surface.

3. Using a calibrated Biliblanket Light Meter II, measure the light at the 5 points indicated on the below diagram and calculate their average. Confirm that the average is at least 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$. Refer to symptom S11 in Chapter 10 for troubleshooting.



NOTE: IEC standards recommend LED module replacement at 25% output reduction, which corresponds to 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$ and occurs at approximately 10000 hours. However, sufficient irradiance for effective phototherapy continues well after 25% reduction.

4. Divide the lowest reading by the highest reading. If the LED light is functioning properly, the result should be greater than 0.4. Refer to symptom S12 in Chapter 10 for troubleshooting.

8.4.4 Electrical Safety Tests

It is recommended that the electrical safety tests be performed as follows:

- Before the first use of Giraffe Blue Spot PT Lite
- Each time the system is serviced
- Every twelve months thereafter

Use an approved electrical safety analyzer. Follow the operating instructions supplied by the vendor of the electrical safety analyzer. For reliable leakage current checks, perform the ground resistance check first.

8.4.4.1 Ground Resistance Check

The ground resistance check varies depending on the power source:

- For a system plugged into a wall outlet, measure the resistance between power cord ground terminal and the potential equalization stud on the system. The ground resistance must be less than 0.1 ohms.
- For a system plugged into an accessory outlet on a microenvironment, measure the resistance between the power cord ground terminal of the microenvironment and the potential equalization stud on the Giraffe Blue Spot PT Lite. The ground resistance must be less than 0.2 ohms.

8.4.4.2 Leakage Current Checks

In normal conditions and in all possible operating modes:

- For a system plugged into a wall outlet, measure the leakage current and confirm that it is less than 130 microamperes.
- For a system plugged into an accessory outlet on a microenvironment, measure the leakage current and confirm that it does not increase leakage current of the microenvironment by more than 130 microamperes.

If required by local ordinances, in single fault condition and in all possible operating modes:

- For a system plugged into a wall outlet, measure the leakage current and confirm that it is less than 500 microamperes.

- For a system plugged into an accessory outlet on a microenvironment, measure the leakage current and confirm that it does not increase leakage current of the microenvironment by more than 500 microamperes.

Chapter 9: Calibration

No calibration is required for the Giraffe Blue Spot PT Lite.

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Chapter 10: Diagnostics and Troubleshooting

This chapter lists possible symptoms as well as the possible causes and solutions. For any necessary part replacements or adjustments, follow the instructions provided in “Chapter 11”. Always read all the warnings, cautions, notes, and other information provided in the “Important Service Safety Information” before starting any troubleshooting.

NOTE: For each symptom, the possible causes are listed in a certain sequence to provide a quick and effective troubleshooting guide. Therefore, investigate the possible causes of each symptom in order from top to bottom to find the root cause of the symptom.

ID	Symptom Description	Possible Causes	Actions & Solution
S1	When system is in standby mode (plugged into power outlet and standby/on switch is not pressed yet), **BOTH** the standby/on indicator and hour meter display are off. (Normally, when the system is plugged into a power outlet, the standby/on indicator is green and the hour meter display shows an hour number.)	Power cord is not properly connected.	Confirm that the power cord is plugged into the power outlet and securely connected to the power inlet module of the system.
		No power at the outlet.	Confirm power is available at the power outlet.
		Fuses are open (defective) or missing.	Refer to section 10.1.
		A system wire harness is disconnected.	Remove the unit cover and check whether all the wire harnesses are properly plugged and connected. Refer to section 11.5.
		Power entry module is defective.	Remove the unit cover and measure the AC input to the power supply. Replace the power entry module if necessary. Refer to section 11.6.
		Power supply board / LED driver board is defective.	Remove the cover and measure the voltage between GND and -12V test points on the LED driver board using a multi meter. Confirm if the voltage is within the -12V +/- 0.15 range. If not, remove the AC power and then unplug the DC harness coming from power supply board at LED driver board side. Restore AC power and then re-measure voltage at the harness connectors. If the voltage is now within the range, replace the LED drive board (Refer to section 11.7). Otherwise, remove the LED driver board and: a) disconnect the DC harness from the power supply board and perform the wire continuity test on the harness to confirm the harness is not defective. Replace the DC harness if necessary. b) with the DC harness disconnected from the LED driver board, use a small screw driver to set the power supply output voltage to be within the -12V +/- 0.15 range by adjusting R13 potentiometer on the power supply board. If the output voltage cannot be set, replace the power supply board (Refer to section 11.8). **NOTE:** The power supply board has internal short circuit protection that could be limiting the output voltage due to a short circuit in the load (LED driver board).
		LED driver board / Control board is defective.	Remove the cover and measure the voltage between GND and V+ test points on the LED driver board using a multi meter. Confirm if the voltage is within the 5V +/- 0.3 range. If not, remove the AC power and then unplug the control harness from the control board. Restore AC power and then re-measure the voltage between GND and V+. If the voltage is still outside of the range, replace the LED driver board (Refer to section 11.7). Otherwise, a) disconnect the control harness on both ends and perform the wire continuity test on the harness to confirm the harness is not defective. Replace the control harness if necessary. b) If the harness is not defective, replace the control board. Refer to section 11.5.

ID	Symptom Description	Possible Causes	Actions & Solution
S2	When system is in standby mode, either the standby/on indicator or hour meter display is off.	Control board is defective.	Replace the control board. Refer to section 11.5.
S3	Hour meter display shows disordered or bad characters.	Control board is defective.	Replace the control board. Refer to section 11.5.
S4	When the system is switched to on mode, the standby/on indicator stays green and no light is generated.	Control board is defective.	Replace the control board. Refer to section 11.5.
S5	When the system is switched to on mode, the light is generated but standby/on indicator and over/under temperature indicator are **BOTH** off.	Control board is defective.	Replace the control board. Refer to section 11.5.
S6	When the system is plugged into power outlet, the over/under temperature indicator is illuminated in **steady red**.	The system temperature is low (under-temperature condition).	Make sure the system is being used in the recommended temperature range. Allow the system to warm up to the ambient temperature before switching the system into on mode. (The system fan turns on to help the device warm up. When the system has warmed up to the ambient temperature, the system fan will turn off, the over/under temperature indicator will turn off, and the standby/on indicator will illuminate green. This process may take several minutes.)
		Thermistor wire harness is unplugged.	Remove the unit cover and check whether the thermistor wire is plugged into its corresponding connector on LED driver board. Also confirm that the thermistor wire is not disconnected at the other end (LED module). Refer to section 11.6.
		Thermistor wire is defective.	Disconnect the thermistor wire on both ends and perform a wire continuity test using a multi meter. Replace the harness if necessary.
		Control harness is defective.	Remove the control harness and use a multi meter to perform a wire continuity check on the harness wires. Replace the harness if necessary.
		Thermistor is defective.	Make sure the system is being used in the recommended temperature range. Allow the system to warm up to the ambient temperature if needed. Disconnect the thermistor harness from LED driver board side (P2 connector) and measure the resistance across the harness wires using a multi meter. If the multi-meter reads OPEN (high impedance), use a small wire to short the pins of P2 connector on the driver board. If the over/under temperature indicator starts flashing red, replace the LED module (Refer to section 11.7). Otherwise, replace the control board (Refer to section 11.5).

ID	Symptom Description	Possible Causes	Actions & Solution
S7	When the system is switched to on mode, the over/under temperature indicator is illuminated in **flashing red**.	The system temperature is high (over-temperature condition).	Make sure the system is used in the recommended temperature range. Check whether the vents are blocked. Unblock vents and replace the air filter if necessary. **NOTE:** Once the air vents are unblocked, the fan will continue to run to cool the LED module. Once the LED module cools, the over/under temperature indicator will also turn off and the standby/on indicator will illuminate green. This process may take several minutes.
		System fan is not functioning or it is installed backward.	Remove the unit cover and check whether the fan is installed properly and functioning. If the fan is installed backward, re-install it properly. If the fan is not functioning, a) check whether the fan is plugged in and/or any objects are stuck in it. b) disconnect the fan wire from the LED driver board and measure the voltage between FAN+ and FAN- test points on the LED driver. If the voltage is within 12V +/- 0.15 range, then replace the fan. Otherwise, replace the LED board. Refer to section 11.7.
S8	When the system is switched to on mode, the standby/on indicator turns to blue but no light is generated.	Light output block.	Unplug the system power cord from the power outlet. Remove the light pipe and look into the light pipe port to confirm no object is blocking the light output.
		LED anode or cathode cables connections are reversed or unplugged.	Remove the unit cover and check whether the anode and cathode cables are unplugged or reversed. Make proper connections if necessary. Refer to section 11.7.
		The control harness is defective.	Remove the control harness and use a multi meter to perform a wire continuity check on the harness wires. Replace the harness if necessary.
		LED module is defective.	Use a digital multi meter set for checking diodes to check the therapeutic light LED. Disconnect the LED anode and cathode cables from the driver board. If any of the following steps fail, LED module is defective; Otherwise, the driver board is defective. Order the LED module FRU kit to replace both the LED module and the driver board: a) Connecting the meter's positive lead to the anode, and the negative lead to the cathode, should yield about 2.5V and potentially dimly light the LED. b) Reversing the leads should result in an open voltage on the LED and the LED should not light.
S9	Light pipe does not rotate or is very hard to rotate.	Ground clip is damaged.	Check whether the ground clip is damaged. If it is damaged, replace it. Refer to section 11.3.
		Light pipe O-rings are damaged or have insufficient lubricant.	Remove the light pipe and examine the O-rings for any damages or lack of lubricant. If necessary, replace the O-rings. Refer to section 11.3.
S10	Light pipe sags and it doesn't hold the position.	Light pipe is damaged.	Replace the light pipe. Refer to section 11.3.

ID	Symptom Description	Possible Causes	Actions & Solution
S11	The system generates low light output (less than 27 $\mu W \cdot cm^{-2} \cdot nm^{-1}$ on average).	Protective cover of light shade is dirty or heavily scratched.	Clean the cover or replace the light shade if necessary. Clean the cover gently using an optical cleaner and a lint-free wipe. For replacement instructions, refer to section 11.4.
		Light pipe is improperly installed.	Remove the light pipe and re-install it properly. Refer to section 11.3.
		Wrong light meter is used for light output measurement.	Make sure that the recommended light meter is used for light output measurement.
		The light shade is farther than 38 cm (15") from the bed surface or not directly aimed at it.	Focus the therapeutic light such that the spot diameter is 35.5 cm (14") or the shade is 38 cm (15") from the bed surface, and the light is aiming at the bed surface.
		Light pipe is defective or LED module is defective or reached end-of-life.	Contact service.
S12	The system generates nonuniform light output distribution (the lowest to highest reading ratio is less than 0.4).	Protective cover of light shade is dirty or heavily scratched.	Clean the cover or replace the light shade if necessary (Refer to section 11.4).
		Light pipe is improperly installed.	Remove the light pipe and re-install it properly.
		Light pipe is defective.	Replace the light pipe.

10.1 Troubleshooting Fuses

1. Access the system fuses as per instructions in section 11.2 to confirm that both fuses are present.
2. Verify the fuse continuity by measuring the fuse resistance using a multimeter.
3. If the fuse is open, try to locate a short circuit or other fault and fix it before replacing the fuse.
4. If no short circuits or wiring faults are found, replace the fuse as instructed in section 11.2.

10.2 Test Points and Adjustment Point Locations

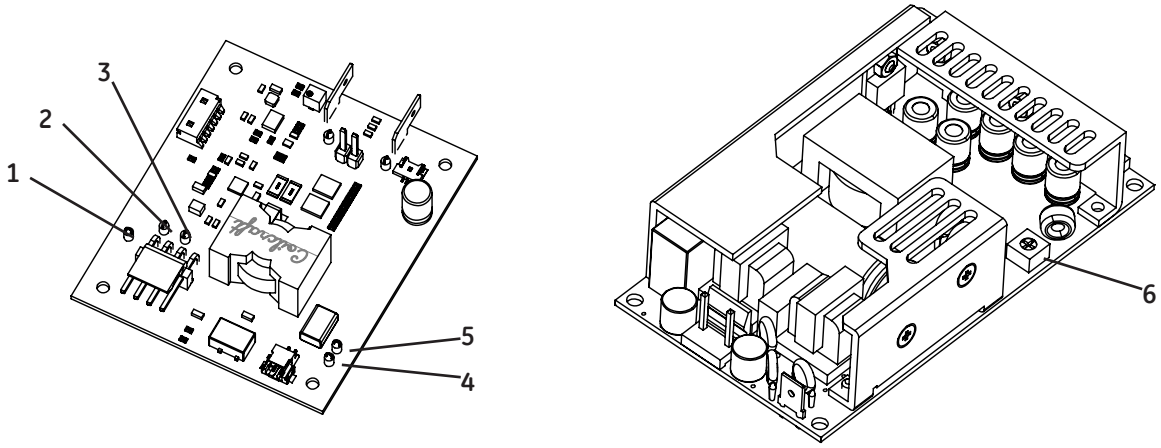

Figure 10-1 Test points and adjustment points

Callout	Part Description
1	V+ test point (LED driver board)
2	GND test point (LED driver board)
3	-12V test point (LED driver board)
4	Fan+ test point (LED driver board)
5	Fan- test point (LED driver board)
6	R13 potentiometer adjustment point (power supply board)

Note: Test points and adjustment point are used for diagnostics and troubleshooting purposes.

Chapter 11: Replacement Procedures

This chapter describes the procedures used for replacement of the Giraffe Blue Spot PT Lite service parts. After any replacement procedures, perform checkout procedures, as described in section “8.4”.

Always read all the warnings, cautions, notes, and other information provided in “Important Service Safety Information” before starting any replacement or repair. All replacement and repair procedures shall be performed by authorized service personnel only.

CAUTION:
Always perform electrical safety test after any replacement procedure.

NOTE: Standard service tools (such as a pair of small pliers, screwdrivers and nut drivers) and the provided hex key tool are required to perform repair procedures.

11.1 Air Filter Replacement

1. Press the left and right sides of the air filter guard inward to release the guard and remove the filter (Refer to Figure 11-1).

2. To re-install, put the air filter on the vents. Place the guard on the filter and insert the tabs into their corresponding slots on the system to hold the filter in place.

11.2 Fuse Replacement

1. Make sure the system power cord is unplugged from the power outlet.

2. Release the power cord retainer to unplug the power cord from the system.

3. Use a flat-head screwdriver to open the fuse compartment lid of the power inlet module and pull the compartment out to access the fuses (Refer to Figure 11-2).

4. Remove the fuses.

5. Replace these fuses with the two fuses (T3.15A @ 250V~, slo-blo type) in fuse kit 6600-0730-214.

6. Reverse steps to re-install.

⚠ **CAUTION:**
Always use the fuse type recommended by GE Healthcare for fuse replacement.

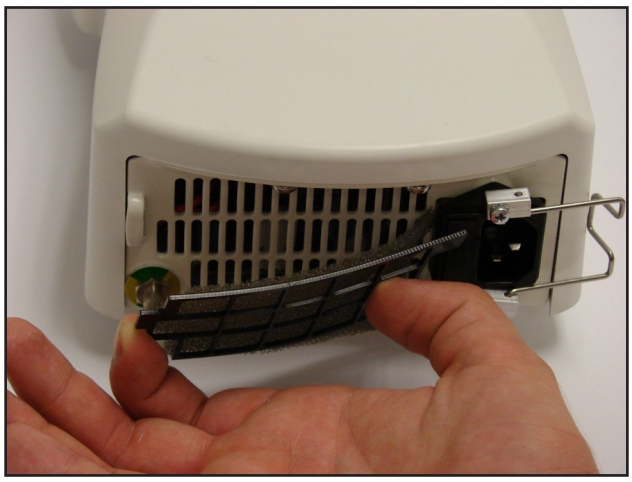

Figure 11-1

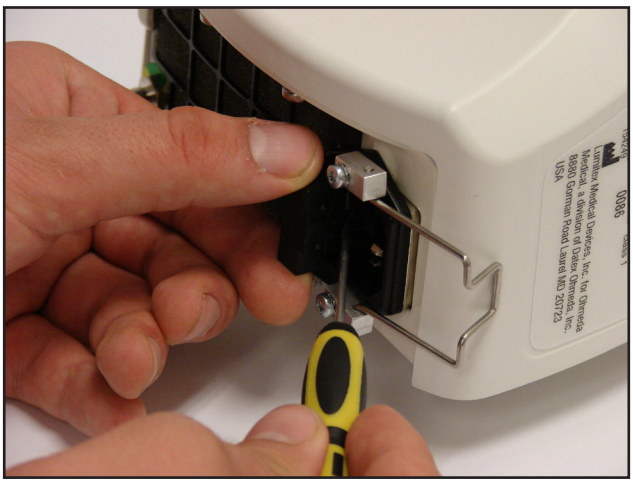

Figure 11-2

11.3 Light Pipe / O-ring / Ground Clip Replacement

1. Make sure the system power cord is unplugged from the power outlet.

2. Use the provided hex key tool to loosen the two screws on the mounting bracket in the rear side of the system and detach the system from the dovetail rail of the bed (Refer to Figure 11-3).

3. Lay the system on its front side on a flat surface. Use the provided hex key tool to remove the mounting screw that attaches the light pipe ground clip to the device and detach the light pipe (Refer to Figure 11-4).

4. To remove the O-rings, rotate the light pipe while pulling out the O-rings.

5. To remove the ground clip, hold the light pipe end close to the clip firmly and then use a pair of long nose or pliers to pull out the clip.

6. Reverse steps to re-install.

⚠ **CAUTION:**
The LED light output is susceptible to dust and dirt. When the light pipe is detached from the system, take care that dust or dirt does not get into the light pipe port on the light box. When storing system with open light pipe port for an extended period, cover the light pipe port.

Figure 11-3

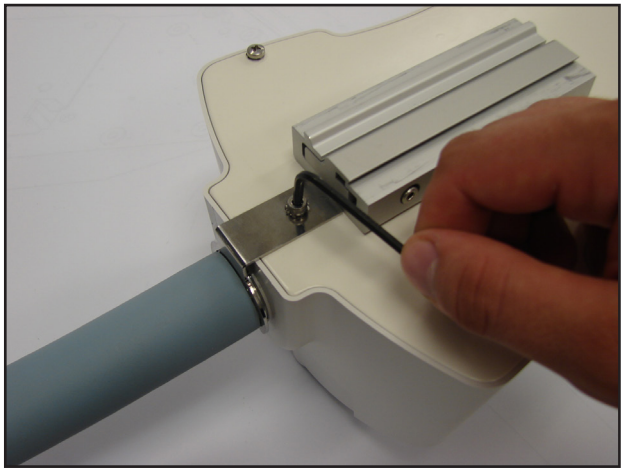

Figure 11-4

11.4 Light Shade Replacement

1. Make sure the system power cord is unplugged from the power outlet.

2. Roll the shade sleeve up to access the orange tape underneath and remove the tape (Refer to Figure 11-5 which shows the shade with orange tape removed).

3. Use a pair of small pliers, or any appropriate tool, to grip and remove the plastic pin to release the shade (Refer to Figure 11-6).

   NOTE: When replacing the light shade, make sure to not touch the fiber. Residual dirt or grease on the fiber can decrease the light output.

4. Reverse steps to re-install.

Figure 11-5

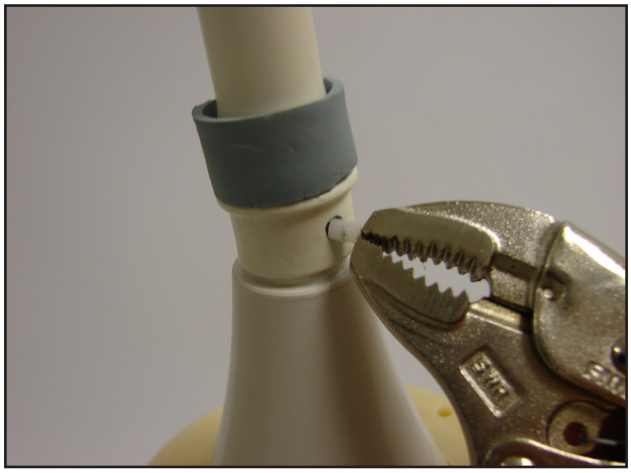

Figure 11-6

11.5 Unit Cover / Control Board Replacement

SENSITIVE TO ELECTROSTATIC DISCHARGE CAUTION
This procedure includes ESD sensitive parts. ESD control guidelines must be followed during this procedure to ensure that static charges are safely conducted to the ground and not through the sensitive device, to prevent damage to the equipment.

1. Make sure the system power cord is unplugged from the power outlet.
2. Remove the light pipe as instructed in section 11.3.
3. Release the power cord retainer to unplug the power cord from the system.
4. Use a Philips screwdriver to remove the back plate screws (Refer to Figure 11-7).
5. Slide off the unit cover gently until the control board harness is accessible and disconnect the harness from the LED driver board (Refer to Figure 11-8).
6. To remove the control board, use a Philips screwdriver to remove the control board screws and pull out the fish paper, control board and the LCD cover.
7. Reverse steps to re-install.

   NOTE: When re-installing the unit cover, ensure the standby/on switch is aligned properly with its corresponding hole on the unit cover prior to cover installation.

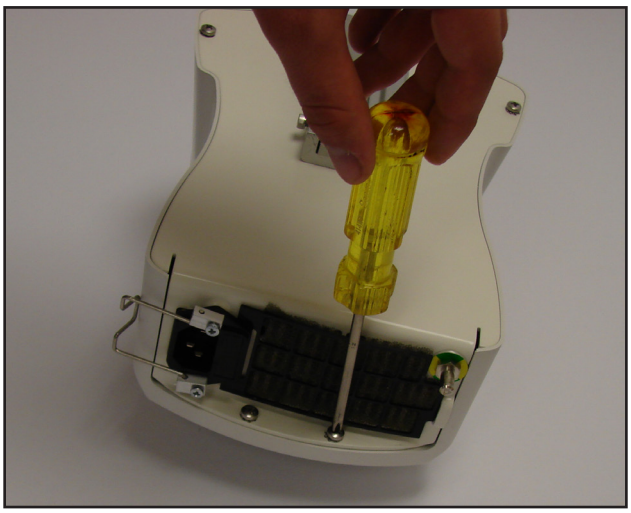

Figure 11-7

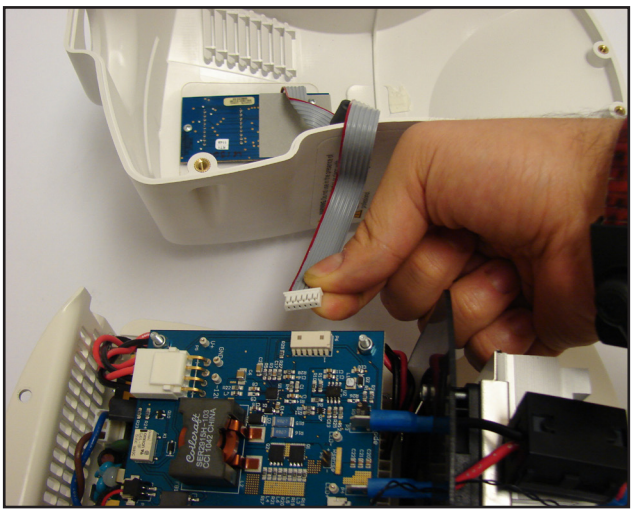

Figure 11-8

11.6 Power Inlet Module / AC and DC Harness Replacement

SENSITIVE TO ELECTROSTATIC DISCHARGE CAUTION
This procedure includes ESD sensitive parts. ESD control guidelines must be followed during this procedure to ensure that static charges are safely conducted to the ground and not through the sensitive device, to prevent damage to the equipment.

1. Make sure the system power cord is unplugged from the power outlet.
2. Release the power cord retainer and pull the power cord out of the power inlet module.
3. Remove the unit cover as instructed in section 11.5.
4. Remove the air filter as instructed in section 11.1.
5. Unplug the AC harness wires from the power module (Refer to Figure 11-9). Note how AC wires are connected to power module terminals before unplugging them to avoid wrong connections during re-installment.
6. Use a Philips screwdriver to remove the power inlet module screws and pull the module out.
7. To remove the AC harness, disconnect the AC harness from the power supply board. To remove the AC harness ground wire, use a 7 mm nut driver to remove the nut that attached the wire to the back plate to release the ground wire (Refer to Figure 11-10).
8. To remove the DC harness, disconnect the harness from the LED driver board and from the power supply board.
9. Reverse steps to re-install.

CAUTION:
When re-installing, make sure to connect the AC harness phase and neutral wires correctly to their corresponding terminals on power inlet module.

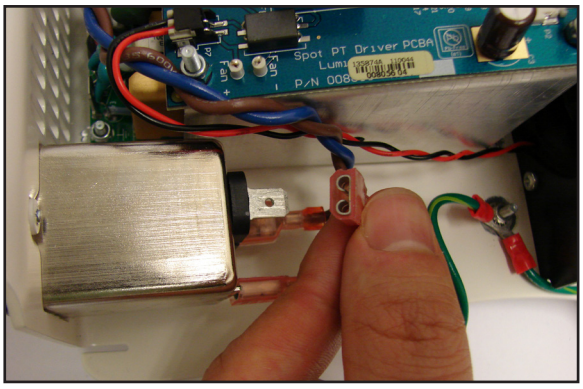

Figure 11-9

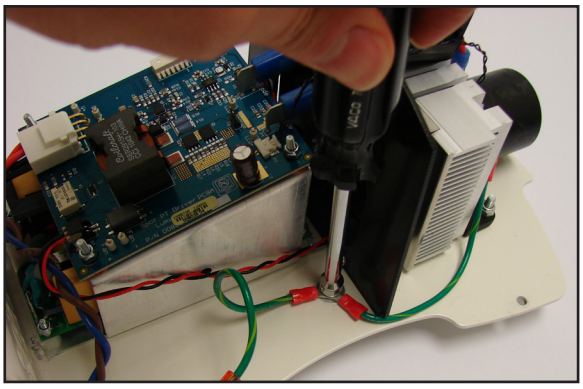

Figure 11-10

11.7 LED Module, LED Driver Board, Fan Replacement

⚠	**WARNING:** When replacing the LED module, always make sure the system power cord is unplugged from the power outlet.
⚠	**WARNING:** Never look directly at the therapeutic-light LED. Exposure can cause eye damage.
⚠	**CAUTION:** The LED driver board and the LED module shall always be replaced in pair with a new factory-set pair. Mixing and matching is not allowed.
	SENSITIVE TO ELECTROSTATIC DISCHARGE CAUTION This procedure includes ESD sensitive parts. ESD control guidelines must be followed during this procedure to ensure that static charges are safely conducted to the ground and not through the sensitive device, to prevent damage to the equipment.

1. Make sure the system power cord is unplugged from the power outlet.

2. Remove the unit cover as instructed in section 11.5.

3. Disconnect the LED anode and cathode wires from the LED driver board and pull them away from the baffle (Refer to Figure 11-11).

4. Disconnect the thermistor harness from the LED driver board and pull it away from the baffle (Refer to Figure 11-12).

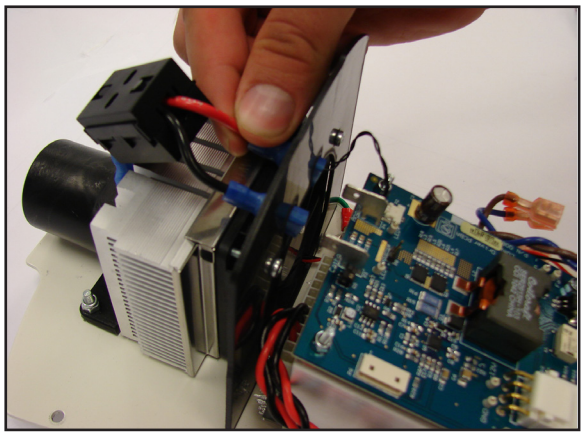

Figure 11-11

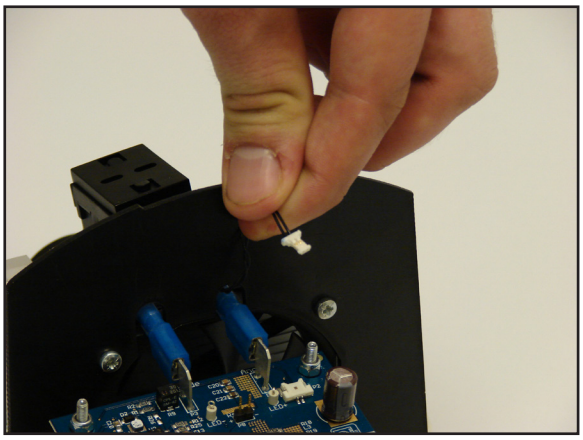

Figure 11-12

5. To remove the LED driver board, disconnect the DC harness and the fan wire connector from the LED driver board and then use a 5.5mm nut driver to remove the LED driver board nuts to release it.

6. Use a 5.5mm nut driver to remove the nut that attached the LED Ground Harness to the back plate to release the harness (Refer to Figure 11-10).

7. Use a 7mm nut driver to remove the nuts that attach the LED module to the back plate and pull out the whole module and fan assembly (Refer to Figure 11-13).

   NOTE: Skip step 8 if the LED module FRU kit is ordered for replacement. The kit contains the LED module with a new fan attached to it.

8. To remove the fan, use a Philips screwdriver to remove the fan screws to release the fan (Refer to Figure 11-14).

9. Reverse the steps to re-install.

   NOTE: When re-installing the fan, make sure that the arrow symbol on the top side of the fan points towards the heat sink to avoid backward installation (Refer to Figure 11-15). Furthermore, to re-install the baffle, position it such that the baffle holes are on the left side (Refer to Figure 11-16).

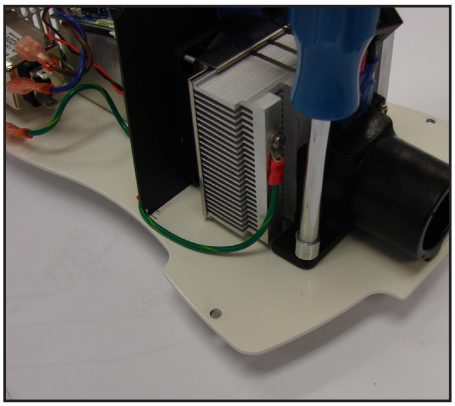

Figure 11-13

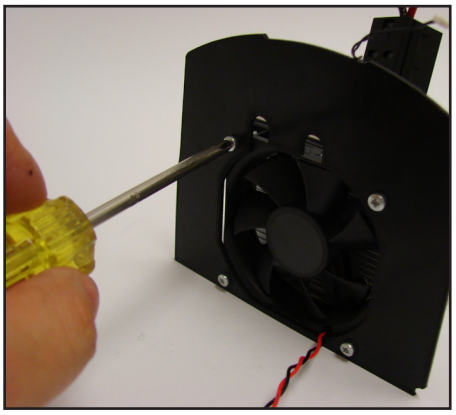

Figure 11-14

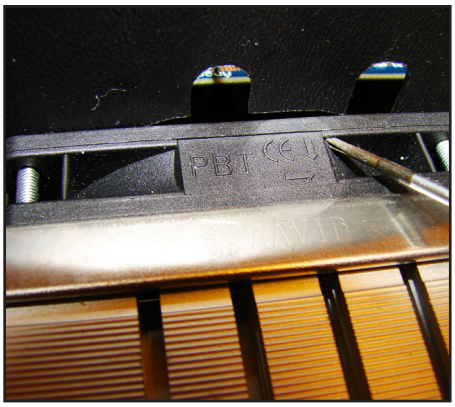

Figure 11-15

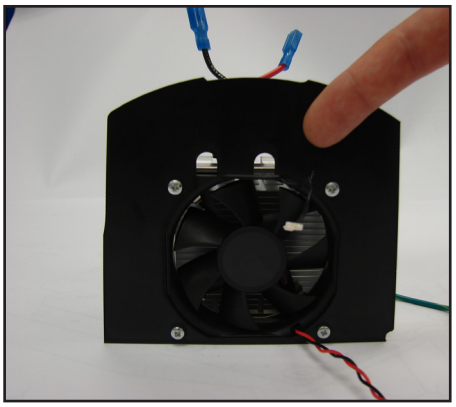

Figure 11-16

11.8 Power Supply Replacement

SENSITIVE TO ELECTROSTATIC DISCHARGE CAUTION
This procedure includes ESD sensitive parts. ESD control guidelines must be followed during this procedure to ensure that static charges are safely conducted to the ground and not through the sensitive device, to prevent damage to the equipment.

1. Make sure the system power cord is unplugged from the power outlet.
2. Remove the unit cover as instructed in section 11.5.
3. Remove the LED driver board as instructed in section 11.7.
4. Use a 5.5mm nut driver to remove the nuts that attach the power supply board to the back plate to release it.
5. Reverse steps to re-install.

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Chapter 12: Service Parts

This chapter illustrates the Giraffe Blue Spot PT Lite service parts and includes the orderable service kit/component part numbers. A complete Field Replaceable Unit (FRU) list and a wiring diagram are also provided.

The illustrations and part numbers begin on the next page.

12.1 Illustrated Parts

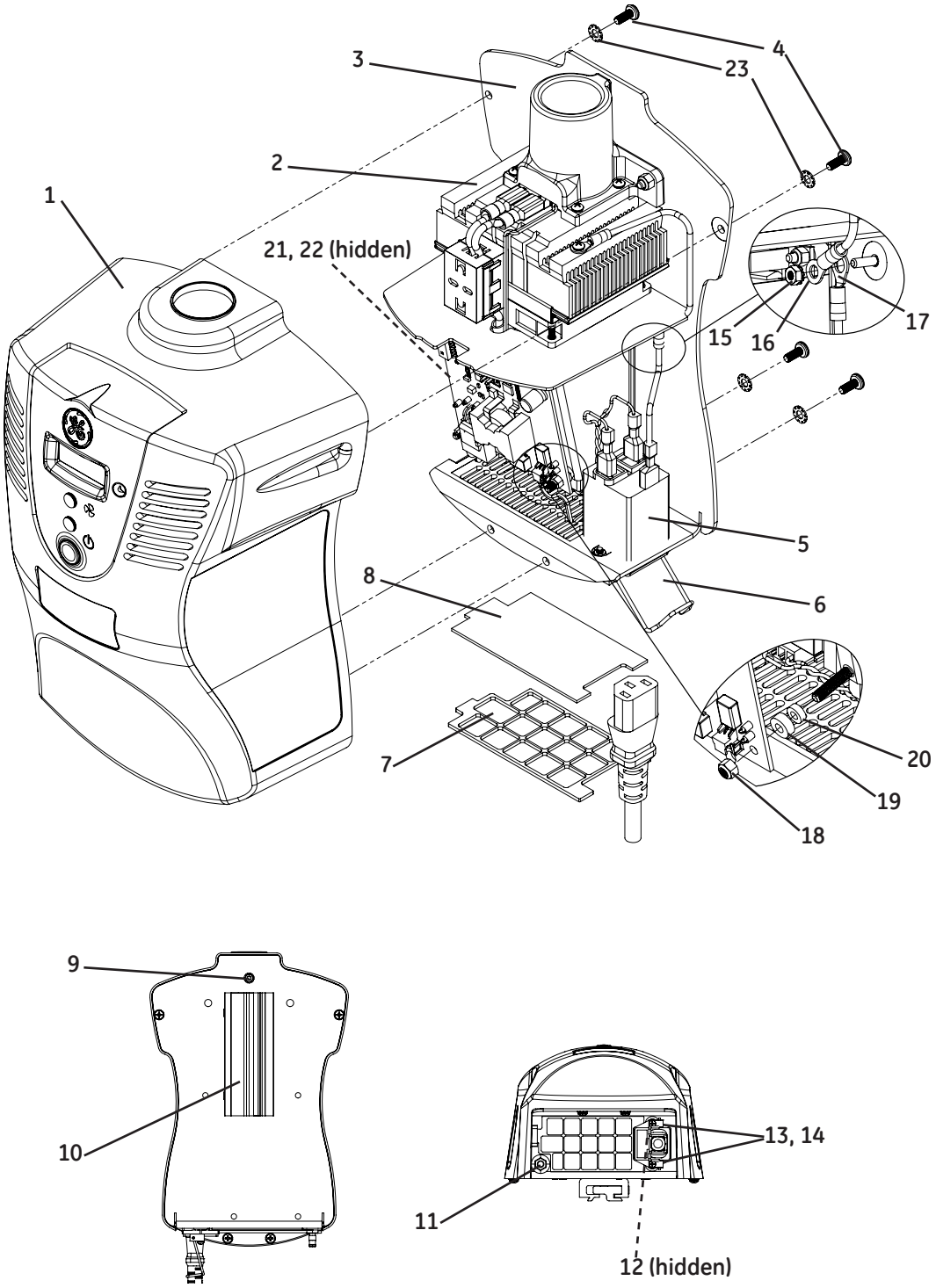


Figure 12-1 Light Box Exploded View

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	Unit cover	M1225847	Cover FRU Kit (English)
		M1225849	Cover FRU Kit (German)
		M1225851	Cover FRU Kit (Spain)
		M1225852	Cover FRU Kit (Italian)
		M1225853	Cover FRU Kit (Dutch)
		M1225855	Cover FRU Kit (French)
		M1225856	Cover FRU Kit (Danish)
		M1225857	Cover FRU Kit (Swedish)
		M1225858	Cover FRU Kit (Czech)
		M1225859	Cover FRU Kit (Polish)
		M1225860	Cover FRU Kit (Chinese)
		M1225870	Cover FRU Kit (Japanese)
		M1225861	Cover FRU Kit (Finnish)
		M1225862	Cover FRU Kit (Greek)
		M1225863	Cover FRU Kit (Hungarian)
		M1225864	Cover FRU Kit (Korean)
		M1225865	Cover FRU Kit (Norwegian)
		M1225867	Cover FRU Kit (Portuguese)
		M1225868	Cover FRU Kit (Russian)
		M1225869	Cover FRU Kit (Turkish)
		M1236610	Cover FRU Kit (French/English)
		2063154-001	Cover FRU Kit (Lithuanian)
		2063156-001	Cover FRU Kit (Romanian)
		2063158-001	Cover FRU Kit (Bulgarian)
		2063160-001	Cover FRU Kit (Estonian)
		2063162-001	Cover FRU Kit (Indonesian)
		2063164-001	Cover FRU Kit (Latvian)
		2063166-001	Cover FRU Kit (Serbian)
		2063168-001	Cover FRU Kit (Slovakian)
		2063926-001	Cover FRU Kit (croation)
2	LED module	M1225811	LED Module FRU Kit
3	Back plate	Non-orderable	Non-orderable
4	Screw, M4	M1225820*	Hardware FRU Kit or Cover FRU Kit
5	Power entry module	2065981-001	Power Entry Module FRU Kit
6	Power cord retention clip	M1225819	Power Cord Retention FRU Kit
7	Air filter guard	M1225816	Air Filter FRU Kit
8	Air filter foam	M1225816 or M1232009	Air Filter FRU Kit or Air Filters (pack of 12)
9	Screw, hex	M1225820	Hardware FRU Kit
10	Dovetail rail lock	M1225818	Dovetail Lock FRU Kit
11	Potential equalization stud	M1225820	Hardware FRU Kit
12	Fuses, T3.15A, 250V, “slow blow”	6600-0730-214	Fuse FRU Kit
13	Screw, Phillips	M1225820 or M1225819	Hardware FRU Kit or Power Cord Retention FRU Kit
14	Bar, retaining clip	M1225820 or M1225819	Hardware FRU Kit or Power Cord Retention FRU Kit
15	Nut, M4 with tooth washer	M1225820	Hardware FRU Kit

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
16	LED ground harness	M1225817 or M1225811	Harness FRU Kit or LED module FRU Kit
17	AC harness ground wire	M1225817	Harness FRU Kit
18	Nut, M3 Nylok	M1225820	Hardware FRU Kit
19	Spacer, nylon, 0.14" ID, 0.125"LG	M1225820	Hardware FRU Kit
20	Rubber washer	M1225820	Hardware FRU Kit
21	Cable tie	M1225820	Hardware FRU Kit
22	Clip mount	M1225820	Hardware FRU Kit
23	Washer M4, External tooth	M1225820*	Hardware FRU Kit or Cover FRU Kit

* This part can be ordered as part of Cover FRU Kit too. See callout 1 for Cover FRU Kit part numbers.

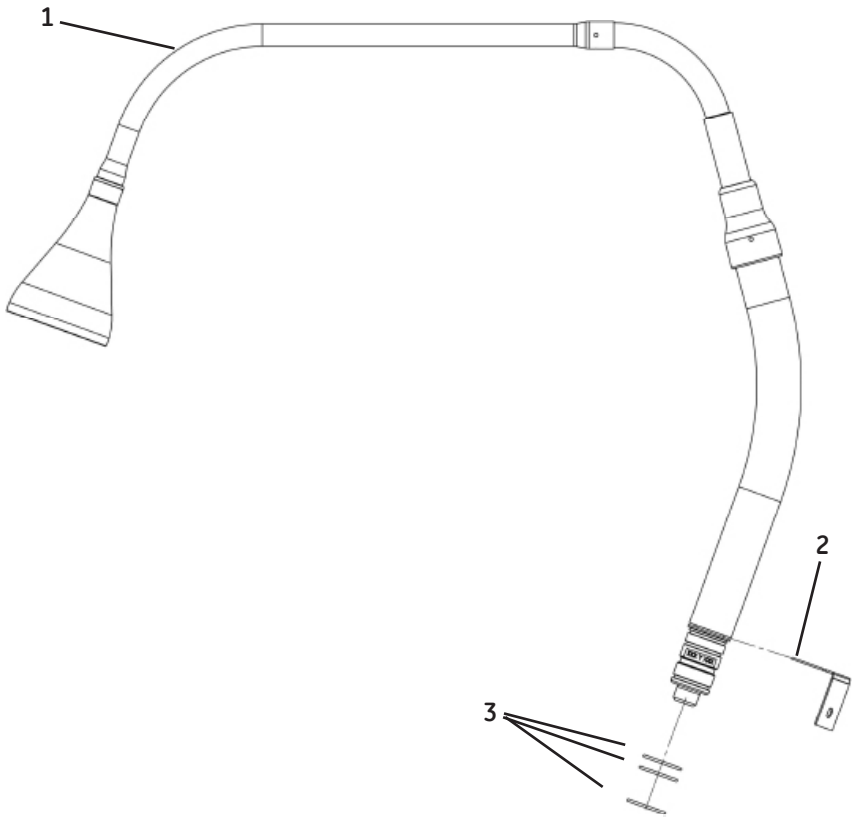


Figure 12-2 Light Pipe

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	Light pipe assembly	M1225812	Light Pipe FRU Kit *
2	Grounding Clip	M1225812 or 2075264-001	Light Pipe FRU Kit * or Grounding Clip FRU kit
3	O-RING, Dash #022 EP	M1225812 or M1226989	Light Pipe FRU Kit* or Light pipe O-ring FRU kit

* This service kit contains a light pipe with an attached light shade, grounding clip and already-lubriacted O-rings. To see contents of the service kit, or Light pipe O-ring FRU kit, refer to section 12.4.2.

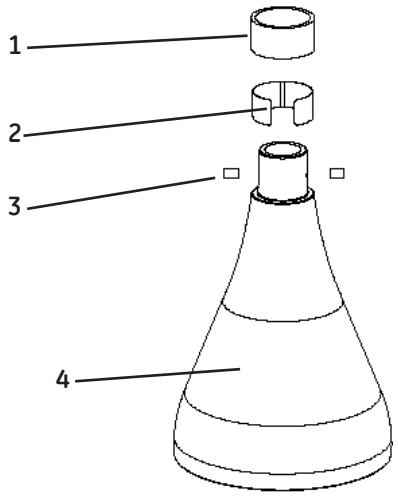


Figure 12-3 Light Shade

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	Sleeve, shade	M1225813	Light Shade FRU Kit
2	Tape, orange	M1225813	Light Shade FRU Kit
3	Retention pin, shade	M1225813	Light Shade FRU Kit
4	Light shade	M1225813	Light Shade FRU Kit

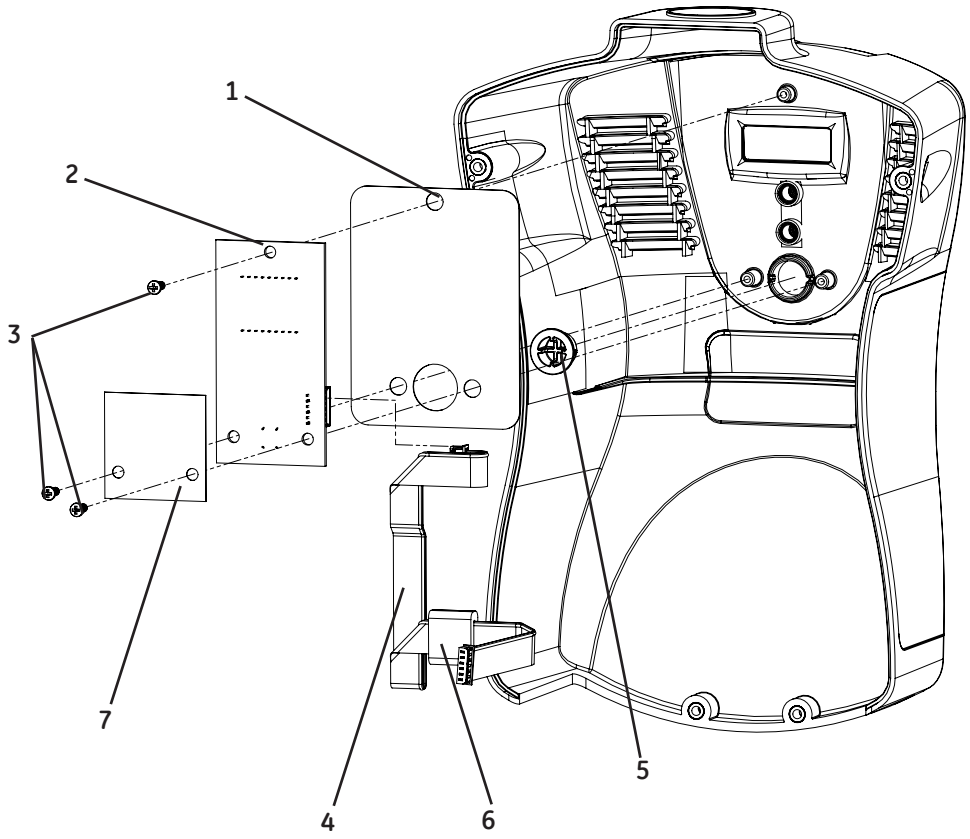


Figure 12-4 Control Board

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	LCD Cover	M1225814	Control Board FRU Kit
2	PCBA, control Board	M1225814	Control Board FRU Kit
3	Screw, M3	M1225814 or M1225820	Control Board FRU Kit or Hardware Kit
4	Harness, Control	M1225817	Harness FRU Kit
5	Switch cap	See Note	See Note
6	Control harness ferrite	M1225817	Harness FRU Kit
7	Fish paper	M1225814	Control Board FRU Kit

Note: Swtich cap is a component of the unit cover kit. Refer to the table corresponding to Figure 12-1 for unit cover kit part numbers and section 12.4.2 to see service kit contents.

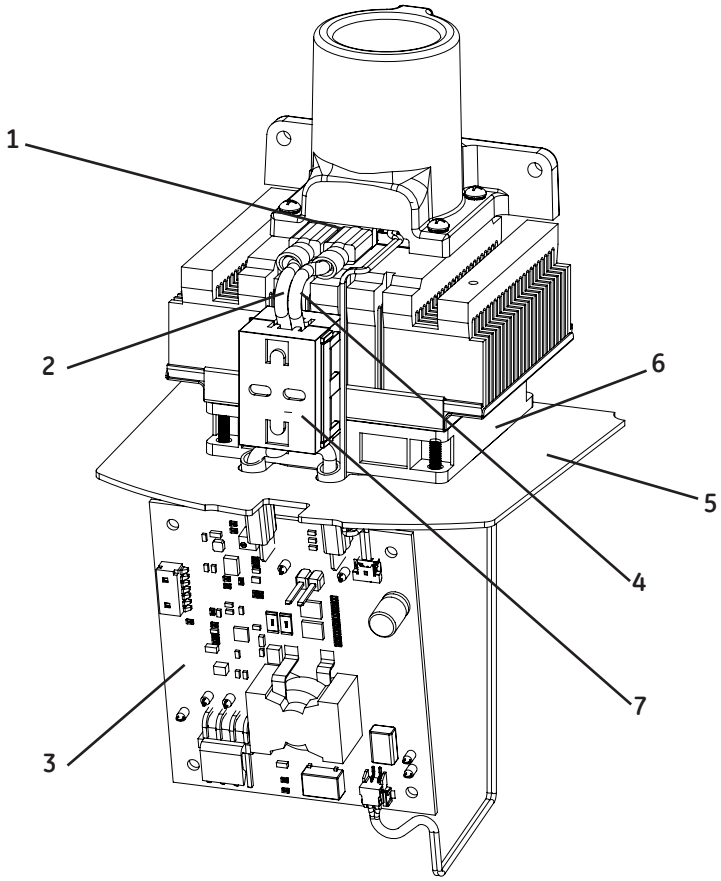


Figure 12-5 LED Module Assembly

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	LED Heatsink Assembly	M1225811	LED Module FRU Kit
2	Cathode harness (black)*	M1225811 or M1225817	LED Module FRU Kit or Harness FRU Kit
3	Driver board	M1225811	LED Module FRU Kit
4	Anode harness (red)*	M1225811 or M1225817	LED Module FRU Kit or Harness FRU Kit
5	Baffle	M1225811	LED Module FRU Kit
6	Fan **	M1225811 or M1236301	LED Module FRU Kit or Fan FRU Kit
7	LED harness (anode and cathode) ferrite	M1225817 or M1225811	Harness FRU Kit or LED Module FRU Kit

* Anode & Cathode harnesses are also orderable through Harness FRU Kit. Refer to Figure 12-7 and section 12.4.2 to see the kit contents.

** Fan is also orderable through Fan FRU Kit. Refer to section 12.4.2 to see the Fan FRU Kit contents.

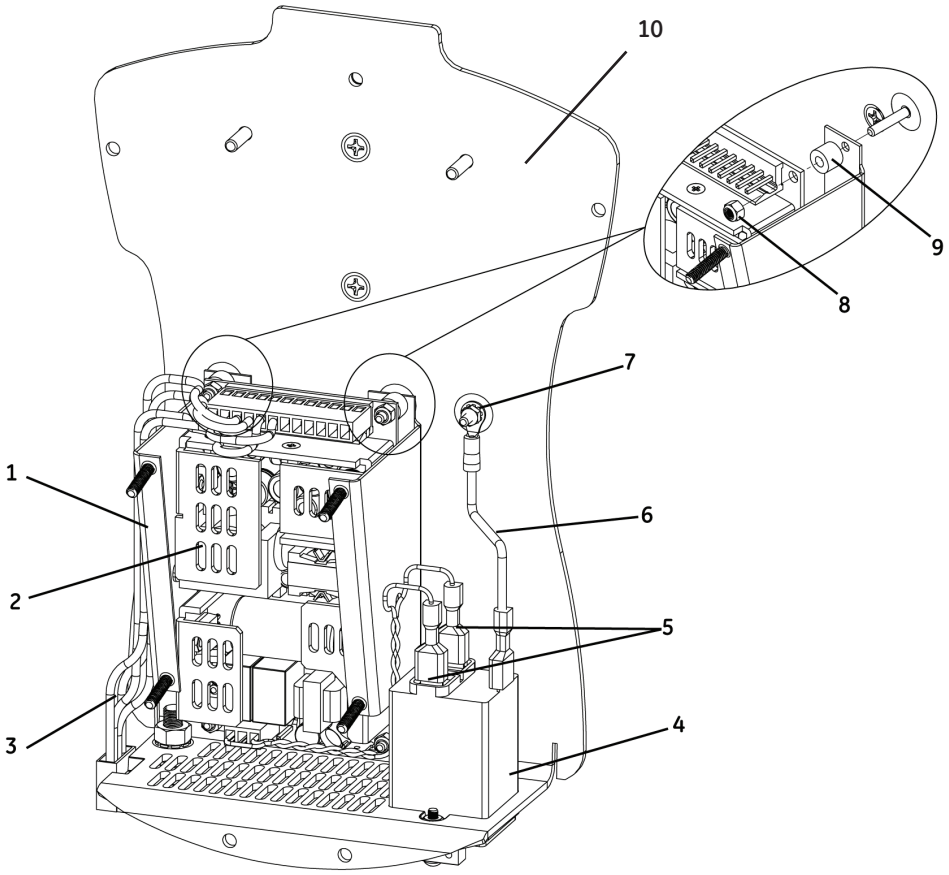


Figure 12-6 Power Supply Board and Power Entry Module

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	LED driver board support	Non-orderable	Non-orderable
2	Power supply	M1226990	Power Supply FRU Kit
3	DC harness	M1225817	Harness FRU Kit
4	Power entry module	2065981-001	Power Entry Module FRU Kit
5	AC harness (hot & neutral)	M1225817	Harness FRU Kit
6	AC harness (ground)	M1225817	Harness FRU Kit
7	Hex Nut, M4 with tooth washer	M1225820	Hardware FRU Kit
8	Nut, M3, Nylok	M1225820 or M1226990	Hardware FRU Kit or Power supply FRU Kit
9	Spacer, Nylon, 0.14”ID x 0.25” LG	M1225820 or M1226990	Hardware FRU Kit or Power supply FRU Kit
10	Back plate	Non-orderable	Non-orderable

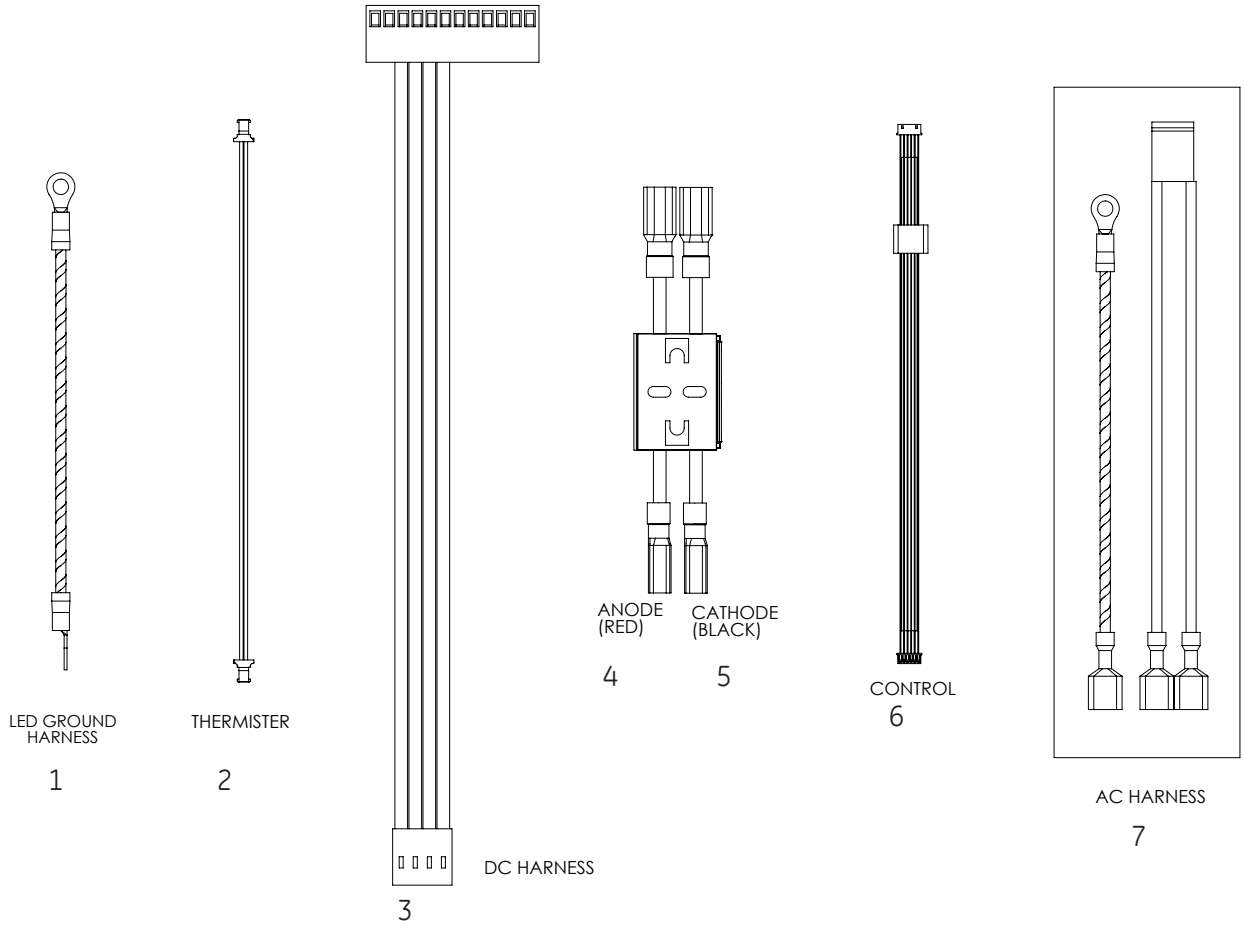


Figure 12-7 Harnesses

Callout	Part Description	Orderable Service Part Number	Orderable Service Part Description
1	LED Ground Harness	M1225817	Harness FRU Kit
2	Thermistor Harness		
3	DC Harness		
4	Anode (Red)		
5	Cathode (Black)		
6	Control Harness		
7	AC Harness		

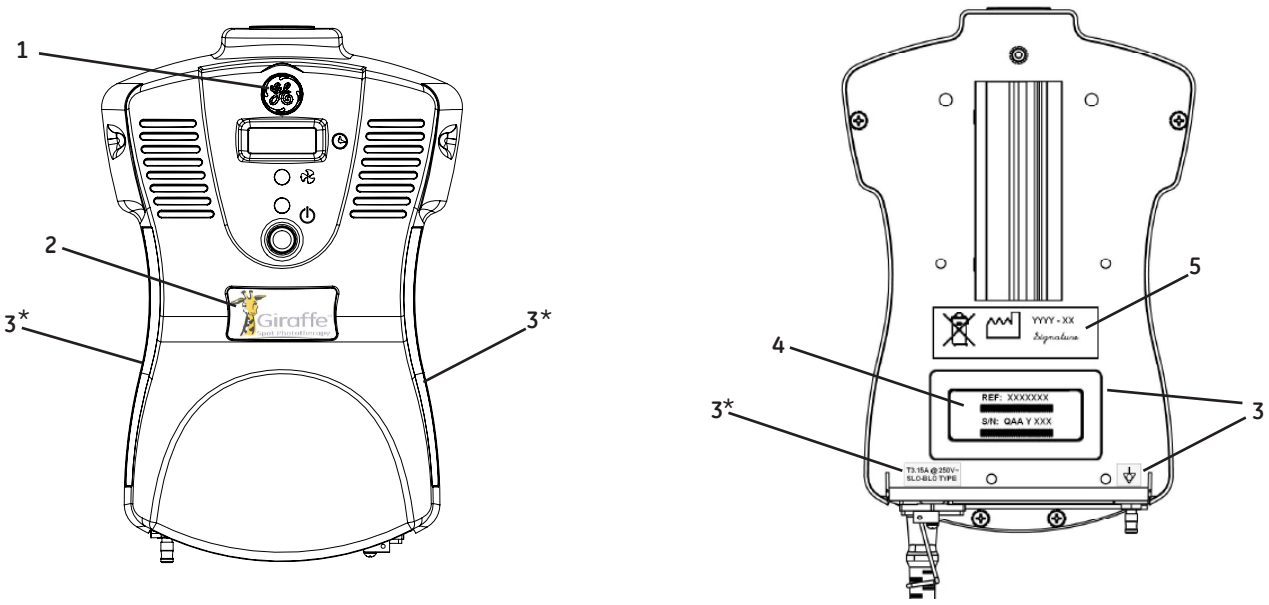


Figure 12-8 Labels

Callout	Label Description	Orderable Part Number	Orderable Part Description
1	GE logo label	M1231816	GE logo label
2	Giraffe brand label	M1229489	Giraffe brand label
3*	Warning Label	Non-orderable	Non-orderable
4	Serial Number Label	Non-orderable	Non-orderable
5	Date of Manufacture Label	Non-orderable	Non-orderable

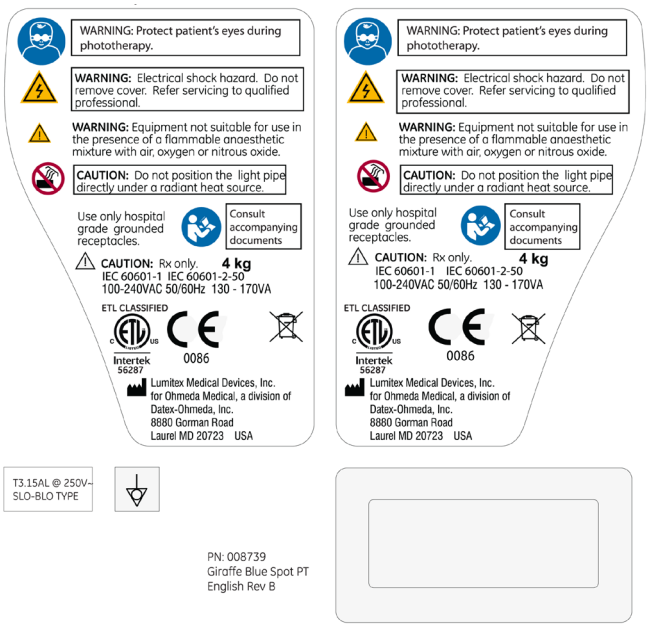
*Warning labels are not orderable. Order an appropriate cover FRU Kit (see Figure 12-1) to get a new unit cover with a language-specific warning label attached to it.

12.2 Labels

This section includes the Giraffe Blue Spot PT Lite labels. Labels are available in a variety of languages. If you do not see labels in your language, please contact your service representative. For the location of each label, refer to Figure 12-8.

NOTE: The following labels shown are for illustration purposes only. The content on the labels shown here may be slightly different from the content of the actual labels on the system.

NOTE: Warning labels are not orderable. Order appropriate cover FRU Kit.

Label Description	Part Number	Part Description
	M1231816	GE Logo Label
	M1229489	Giraffe Brand Label
	Non-orderable	Non-orderable (Order an appropriate Cover FRU Kit (see Figure 12-1) to get a new unit cover with the language-specific warning/branding label attached to it.)

12.3 Power Cords

Power Cord Part Number	Power Cord Description
M1229893	Power cord - USA / Canada / Mexico
M1177960	Power cord - South Africa
6600-0745-200	Power cord - CE
6600-0744-200	Power cord - UK
6600-0574-614	Power cord - Australia
M1233856	Power cord - China
M1233857	Power cord - Denmark
M1171635	Power cord - Switzerland
M1233858	Power cord - India
2064615-001	Power cord - Philippines
M1233860	Power cord - Israel
M1231502	Power cord - IEC
M1233855	Power cord - Japan
M1236635	Power cord - Italy

12.4 FRU List

12.4.1 Spare Parts - Components

Service Part Number	Service Part Description
6600-0714-200	Touchup paint, light gray
M1231816	GE Logo Label
M1229489	Giraffe Brand Label
M1231448	Hex Key
M1232009	Air filters (pack of 12)

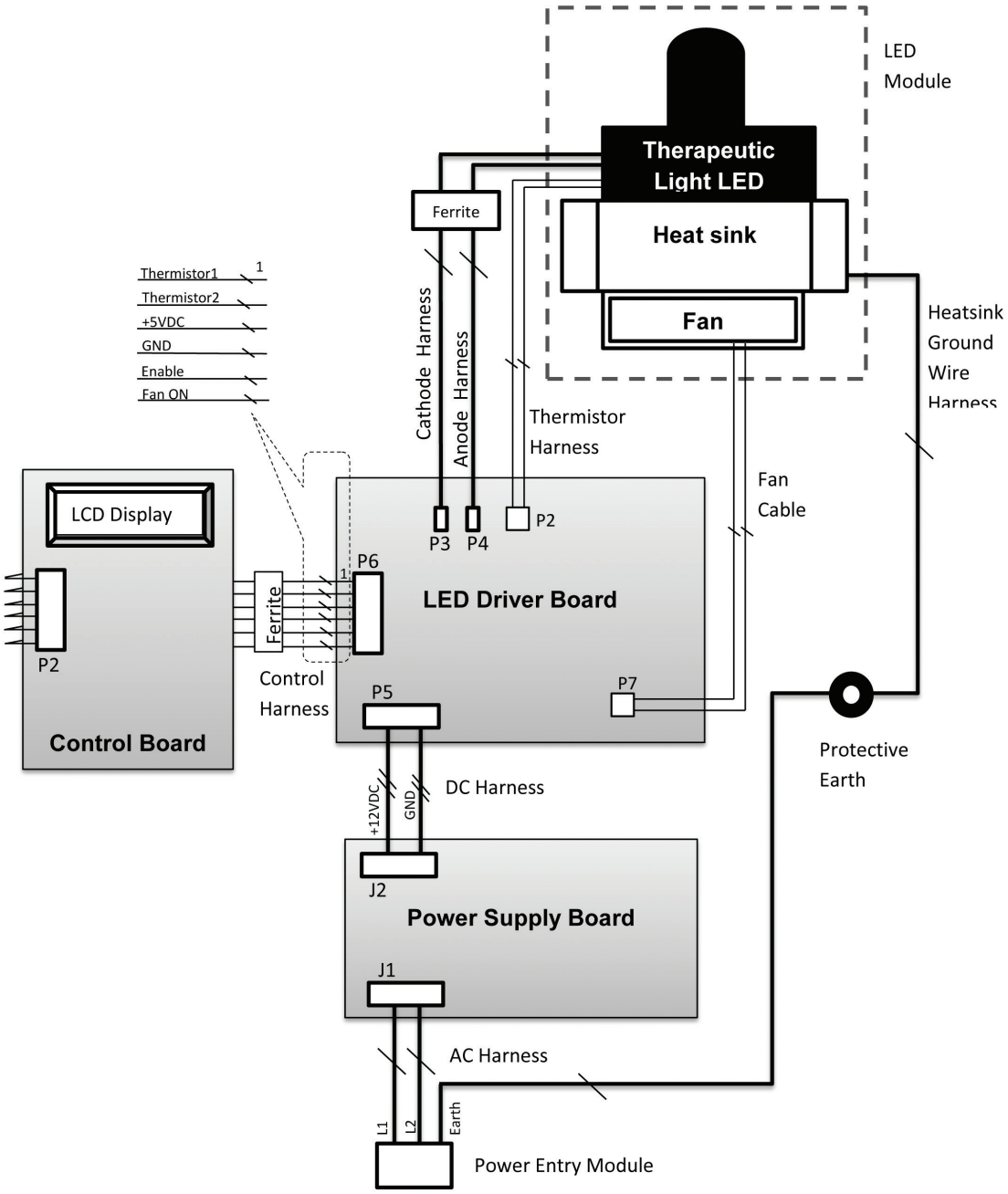
12.4.2 Spare Parts - Service Kits

Part Number	Part Description	QTY
6600-0730-214	**Fuse FRU Kit**	
	Fuse T3.15A 250V SLO-BLO	*[2]*
2065981-001	**Power Entry Module FRU Kit**	
	Power entry module (EMI)	*[1]*
2075264-001	**Grounding Clip FRU Kit**	
	Ground Clip	*[1]*
	Washer, M4, External Tooth	*[1]*
	Screw, M4, Socket Cap, 10 mm	*[1]*
M1225811	**LED Module FRU Kit**	
	LED Module Assembly (Fan included)	*[1]*
M1225812	**Light Pipe FRU Kit**	
	Light pipe gooseneck with attached shade	*[1]*
	O-RING, Dash #022 EP (lubricated)	*[3]*
	Grounding Clip	*[1]*
M1225813	**Light Shade FRU Kit**	
	Light Shade	*[1]*
	Pin retention shade	*[2]*
	Orange Tape	*[1]*
	Sleeve shade	*[1]*
	Output Reflector	*[1]*
M1225814	**Control Board FRU Kit**	
	PCBA, Control board	*[1]*
	Screw, M3, 8MM LG	*[3]*
	LCD cover	*[1]*
	Fish Paper	*[1]*
M1225816	**Air Filter FRU Kit**	
	Filter, foam	*[1]*
	Filter guard	*[1]*
M1225817	**Harness FRU Kit**	
	Harness, AC	*[1]*
	Harness, DC	*[1]*
	Harness, Control with Ferrite	*[1]*
	Harness, Thermistor	*[1]*
	Harness, Anode	*[1]*
	Harness, Cathode	*[1]*
	Harness, LED Ground	*[1]*
	Ferrite, LED Harness clamp on	*[1]*
M1225818	**Dovetail Lock FRU Kit**	
	Lock, dovetail rail	*[1]*
	Screw, M4x.07, 12MM, SS. SOC.HD.CAP	*[2]*
	Washer, M4, External tooth	*[2]*

Part Number	Part Description	QTY
M1225819	**Power Cord Retention FRU Kit**	
	Bar, Retaining clip	*[2]*
	Retention spring	*[1]*
	Screw, M3X16, PAN HEAD	*[2]*
	Washer, M3, EXT. TOOTH	*[2]*
M1225820	**Hardware FRU Kit**	
	Washer, Lock 08.0704	*[1]*
	Nut MV 08.0502	*[1]*
	Bar, retaining clip	*[2]*
	Nut, Hex, M4, W/ EXT. tooth washer	*[1]*
	Nut M3 NYLOK	*[8]*
	Nut M4 NYLOK	*[2]*
	Screw, M3, 8MM LG, Thread-forming	*[3]*
	Screw, M4, 12MM LG, PAN HD.MACH	*[4]*
	Screw, M3, 10MM LG, FLAT HD.MACH	*[2]*
	Screw, M3, 25MM LG,TRILOBULAR PAN	*[4]*
	Screw, M4x.07, 8MM LG, SS. FL.HD.	*[3]*
	Screw, M4x.07, 10MM, SST	*[4]*
	Screw, M3x.05, 10MM LG, SST	*[5]*
	Screw, M4, 10MM LG, SS. SOC.HD.CAP	*[3]*
	Washer, M3, External TOOTH	*[7]*
	Washer, M4, External TOOTH	*[7]*
	Washer, Rubber	*[4]*
	Washer 14.5010	*[1]*
	Clip mount	*[1]*
	Cable tie	*[1]*
	Spacer, nylon, 0.14" ID x 0.25" LG	*[4]*
	Spacer, 0.14"ID, 0.125" LG	*[8]*
	Screw, M3, 16MM LG, PAN HD.MACH	*[2]*
	Potential equalization terminal	*[1]*
M1226989	**Light pipe O-ring FRU Kit**	
	O-ring, dash #022 EP (lubricated)	*[3]*
M1226990	**Power Supply FRU Kit**	
	Power supply, 100W	*[1]*
	Nut M3 NYLOK	*[4]*
	Spacer, Nylon 1/4"	*[4]*
M1236301	**Fan FRU Kit**	
	Fan with connector	*[1]*
	M3 Screw, 25MM LG	*[4]*
	Spacer, 0.14" ID, 0.125" LG	*[4]*
Mxxxxxxx*	**Cover FRU Kit (Language -specific)**	
	Unit cover with country-specific label set and ESD shield	*[1]*
	Switch cap	*[1]*
	Washer, M4, External Tooth	*[4]*
	Screw, M4,	*[4]*

*See Unit Cover on page 75 for appropriate language-specific Cover FRU Kit part numbers.

12.5 Wiring Diagram



Chapter 13: Electromagnetic Guidance and Declarations

13.1 Electromagnetic Compatibility (EMC) Guidance

Safety Standards: IEC 60601-1, IEC 60601-2-50
EMC Standards: IEC 60601-1-2

WARNING:

Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this appendix.

WARNING:

Portable and mobile RF communication equipment can affect Medical Electrical Equipment. Caution should be used when operating such devices around Medical Electrical Equipment.

WARNING:

This equipment/system is intended for use by healthcare professionals only. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the equipment/system, or shielding the location.

13.2 Manufacturer's Guidance and Declaration Regarding Electromagnetic Emissions

The Giraffe Blue Spot PT Lite is intended for use in the electromagnetic environment specified below. The customer or the user of the Giraffe Blue Spot PT Lite should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment Guidance
RF emissions CISPR 11	Group 1	The Giraffe Blue Spot PT Lite uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The Giraffe Blue Spot PT Lite is suitable for use in all establishments, other than Domestic and those directly connected to the public low voltage power supply network that supplies buildings used for Domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

13.3 Manufacturer's Guidance and Declaration Regarding Electromagnetic Immunity

The Giraffe Blue Spot PT Lite is intended for use in the electromagnetic environment specified below. The customer or the user of the Giraffe Blue Spot PT Lite should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	+/- 6kV contact +/- 8kV air	+/- 6kV contact +/- 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material the relative humidity should be at least 30%.
Electrical fast transient/ burst IEC 61000-4-4	+/- 2kV for power supply line.	+/- 2kV for power supply line.	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	+/- 1kV differential Mode. +/- 2kV common mode line.	+/- 1kV differential Mode. +/- 2kV common mode line.	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, shorts interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % Ut (>95 % dip in Ut) 0.5 cycle 40 %Ut (60 % dip in Ut) for 5 cycles 70 % Ut (30 % dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	<5 % Ut (>95 % dip in Ut) 0.5 cycle 40 %Ut (60 % dip in Ut) for 5 cycles 70 % Ut (30 % dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Giraffe Blue Spot PT Lite requires continued operation during power mains interruption, it is recommended that the Giraffe Blue Spot PT Lite be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field environment IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital.

NOTE: Ut is the AC main voltage prior to application of the test level.

13.4 International Electronic Commission (IEC) Guidance and Manufacturer's Declaration Regarding Electronic Immunity

The Giraffe Blue Spot PT Lite is intended for use in the electromagnetic environment specified below. The customer or the user of the Giraffe Blue Spot PT Lite should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment Guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the Giraffe Blue Spot PT Lite, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended Separation Distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 KHz to 80 MHz	3V	$d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	
IEC 60601-2-19 & IEC 60601-2-21	3 V/m 26 MHz to 1 GHz	3 V/m normal operation	$d = 1.2\sqrt{P}$ = 26 MHz to 800 MHz
	10 V/m 26 MHz to 1 GHz	10 V/m no hazard	$d = 2.3\sqrt{P}$ = 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths for fixed RF transmitters as determined by an electromagnetic site survey (see Note 3-a) should be less than the compliance level in each frequency range (see Note 3-b). Interference may occur in the vicinity of equipment. Marked with the following symbol: 

NOTE 1: Portable and mobile RF equipment can affect medical electronic equipment.

NOTE 2: At 80 MHz and 800 MHz, the higher frequency applies . These guidelines may not apply in all situations.

NOTE 3: Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

a. Field strengths from fixed transmitters such as base stations for radio, cellular/cordless telephones and land mobile radios, amateur radios, AM and FM radio broadcasts and TV broadcasts cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Giraffe Blue Spot PT Lite unit is used exceeds the applicable RF compliance level above, the unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Giraffe Blue Spot PT Lite.

b. Over the frequency range 150 KHz to 80 MHz field strengths should be less than 3 V/m.

13.4.1 Recommended Separation Distance Between Portable and Mobile RF Communications Equipment and the Giraffe Blue Spot PT Lite

The Giraffe Blue Spot PT Lite is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Giraffe Blue Spot PT Lite can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Giraffe Blue Spot PT Lite as recommended below, according to the maximum output power of the communications equipment.

Rated Maximum Output Power of Transmitter (W)	**Separation Distance According to Frequency of Transmitter (m)**		
	150 KHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1.0	1.2	1.2	2.3
10.0	3.8	3.8	7.3
100.0	12.0	12.0	23.0

For transmitters rated at a maximum output power not listed above, the recommended separation distance (d) in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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Giraffe Blue Spot PT Lite
Operation, Maintenance, and Service Manual
Printed in USA

To reorder this manual, order M1216337

M1216337 C
Language: English