



# LLS-2000 AND LLS-2000-2

LED LightSource  
OperatorManual

CE



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## 1. INTRODUCTION

### **Congratulations on the purchase of your new LLS-2000 or LLS-2000-2 Light Source!**

This user-friendly LED light source is a high efficiency light source utilizing state-of-the-art superior illumination technology. It offers a variety of features such as:

- 6500<sup>o</sup> K daylight brightness for good colordefinition
- Quietoperation
- Long life, 50,000hrs.
- Compact and lightweight
- Turret which adapts to various types of lightguides
- Pulse-width Modulation (PWM) ElectricalDimming

In short, you have chosen the best and we would like to make sure you receive the optimal results with your new LED Light Source by using itcorrectly.

This Operator Manual will help you to install the device and optimally integrate it with other components of your system. It will also instruct you how to operate the LED Light Source and how to keep it clean. It will give you maintenance and service guidelines as well as recommendations for best performanceresults.

**1.1 INDICATIONS FOR USE:** The LED Light Source is used to illuminate the site of surgery during minimally invasive surgical procedures in arthroscopy (orthopedic surgery), laparoscopy (general and gynecological surgery) and in endoscopy (general, gastroenterological and ENT surgery).The light is transmitted from the light source through a fiber optic cable and ascope.

## 2. WARNINGS/CAUTIONS



**Caution** Federal law restricts this device to sale by or on the order of a licensed practitioner.



**Caution** To prevent fire or electric shock, do not open or expose the LED light source unit to rain or moisture. Refer all servicing to qualified personnel only.



**Caution** Not suitable for use in presence of flammable anesthetic mixture with air or with oxygen nitrous oxide.



**Caution** To prevent any potential electro-magnetic interference, do not use any kind of cellular phone near the light source.



**Caution** This product should be used only with type BF endoscopic instruments which have been certified according to IEC60601-1 for medical equipment and IEC60601-2-18 for endoscopic equipment.



This symbol indicates type BF equipment.



**Caution** User must not alter this device in any fashion. Doing so voids all warranties and statements of suitability for any purpose.



**Caution** All devices connecting to the LED Light Source must be classified as medical equipment. Additional information processing equipment connected to the LED Light Source, a Medical System and the operator must determine that all equipment complies with the appropriate end-product standards (such as IEC60950 or IEC60065 and the Standard for Medical System, IEC60601-1-1).



**Caution** Always set the intensity control to the minimum level and insert the fiberoptic cable into the unit before turning **on** the power. When light is not required at the surgical site, the intensity control should be set to the fully dimmed position. If it becomes necessary to remove the fiber optic cable without turning the unit **off**, turn the intensity control to the fully dimmed position.



**Caution EQUIPMENT CONNECTION** - The fiber optic cable must be a **NON-CONDUCTIVE CABLE**. It should not have conductive shielding or any other conductive connection between the patient and equipment. Such connection will impair safety of the equipment. It must be rinsed free of soaking/disinfectant solution and dried before plugging into the LED light source receptacle. Ensure the optical surface is clean before engaging into the light source.



**Caution** User is responsible for determining if interruption of light output will create an unacceptable risk. If this determination is made arrangements should be taken to reduce the risk.

### 3. SPECIFICATIONS

Item	Specification
Light Sourcetype	LED (Light EmittingDiode)
Power	50Watts
Colortemperature	6500 <sup>o</sup> K
LEDlife	50,000 hours(typical)
Light guideadapter	LLS-2000:ACMI LLS-2000-2:TwoportturretwithACMIandThompson/Olympus
Brightnesscontrol	PWM(Pulse-widthModulation)-0-100%Dimming
Inputvoltage	100-240V AC, 50/60Hz
RatedPower	52watts
RegulatoryApprovals	UL60601-1,CAN/CSAC22.2No.601.1(SUP1+AM2), EN 60601-1-2 and CEmarked
EquipmentClass	Class I,BF-type
Mode ofOperation	Continuousoperation
WaterResistant	Not Protected Equipment,IPX0
OperatingEnvironment Temperature RelativeHumidity AirPressure	+0° to +40° C (32° to 104°F) 0 to 85%rh, noncondensing 700 to 1060hPa
StorageEnvironment Temperature RelativeHumidity AirPressure	-20° to +60° C (-4° to 140°F) 30 to 95%rh, noncondensing 700 to 1060hPa
Dimensions	4.65" W x 3.32" H x 7.25"D
Weight	2.5 lbs./1.14kg

## 4. OPERATING ELEMENTS, SYMBOLS AND FUNCTIONS

### 4.1 FRONT PANEL

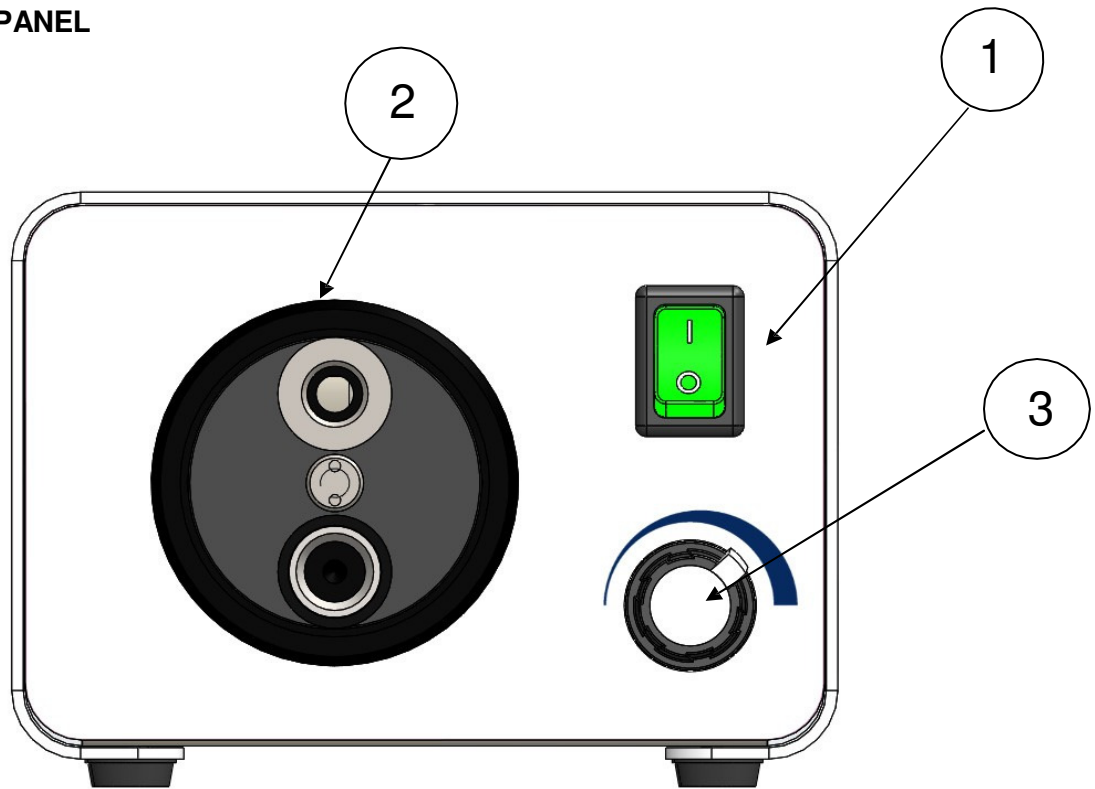


Figure 1.LED Light Source FrontPanel

No.	Name	Function
1	Powerswitch	Turns the light source on and off. Fan will operate
2	Light guideadapter	LLS-2000:ACMI LLS-2000-2: Two port turret with ACMI andThompson/Olympus
3	IntensityControl	Electronically controls the lightoutput

## 4.2 REARPANEL

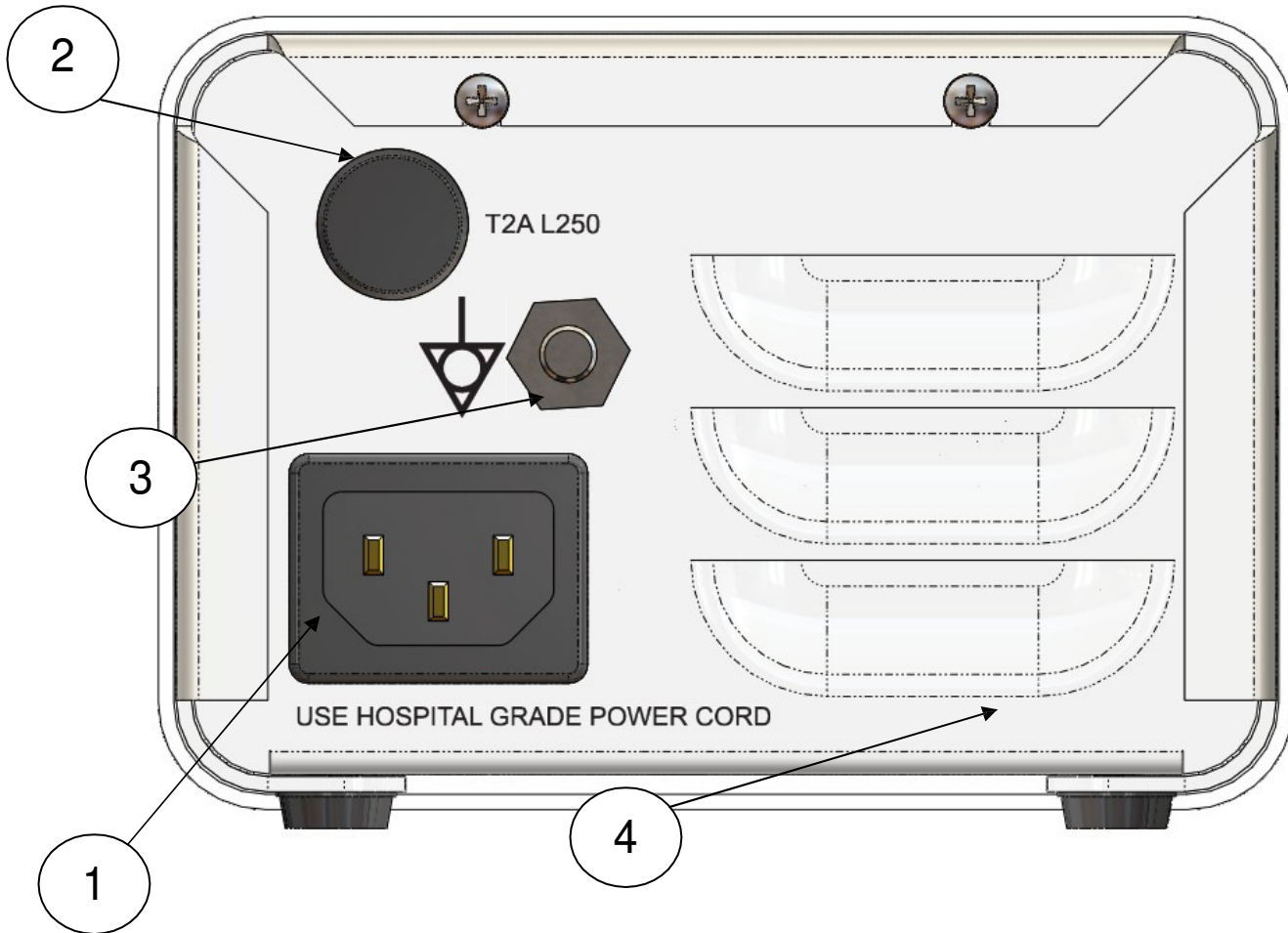


Figure 2.LED Light Source RearPanel

No.	Name	Function
1	AC maininlet	Accepts AC Powercord
2	Fuse	2A, 250V (1/4" x 1 1/4") timedelay
3	GroundingConnector	For potentialequalization
4	Ventinggrids	Allows adequate ventilation and cooling of the lightsource

### 4.3 BOTTOMPANEL

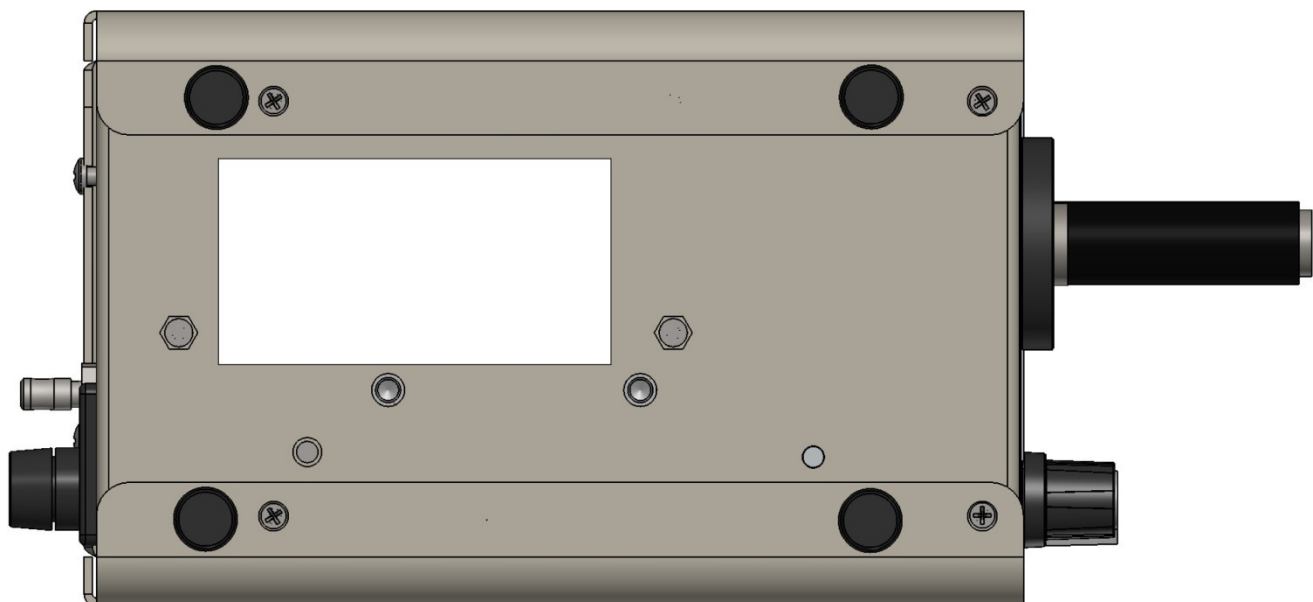


Figure 3. LED Light Source ProductLabel



## 5. INSTALLATION

### 5.1 SETTING UP THE LED LIGHTSOURCE

Place the LED light source on a stable surface (cart, counter, stand, etc.).

**NOTE** *Avoid places where the light source may be splashed with liquid. Absolutely DO NOT use in any environment with explosive or flammable gases.*

**DO NOT block the venting grids of the light source or impede exhaust air flow. A minimum of 6"/15cm on each side and 12"/30cm at the back is required, 24"/60cm is preferred. The lightsource should not be placed where its exhaust will influence other devices, nor where the heated air from other devices will influence the lightsource.**

Make sure the power switch is in OFF position.

Connect AC power cord to the power inlet located on the rear panel of the light source.



***Use only cords provided with the lightsource.***

Plug the AC power cord into a wall outlet using the three-prong plug supplied with the unit.



***To prevent electric shock, connect power cords of peripheral equipment through medical isolation transformers.***

**NOTE** ***When using medical isolation transformer, be sure to check the transformer power ratings. Make sure that the power cord is connected to the main power with three-prong plug (USA use UL2601-1 rated isolation transformers and/or power strip only)***



***When used in clinical or residential areas near radio or TV units, this equipment may be subjected to radio interference. To avoid adverse electromagnetic effects, DO NOT operate this equipment near RF energy equipment.***

### 5.2 CONNECTING THE FIBER OPTIC CABLE

Turn intensity control to the minimum setting. Connect the light cable to the instrument and then plug the light cable end fitting into the port on the front panel.

## 6. OPERATION

### 6.1 POWERING UP THE LED LIGHTSOURCE

To operate the LED lightsource: Turn on the power switch.  
The indicator on power switch will light.

### 6.2 LIGHT BRIGHTNESS DISPLAY AND CONTROL

The light brightness adjustment enables the user to obtain a brighter or darker illumination of the object of observation.

Adjust the light intensity by turning the intensity control knob.

## 7. CLEANING

**NOTE** *Always disconnect the power cord before cleaning the system.*

The unit can be cleaned with any cleaning agent, which is used for external cleaning of electric equipment, according to instructions given by the manufacturer of the cleaning solution.

Do not allow excessive moisture or liquids to come in direct contact with the unit.

Do not use cleaning agents that are not permitted for use with plastics, i.e., ammonia, acetone, salty acids (HCl), etc.

Do not allow cleaning agents or liquids to enter the control unit outlets or vents at side, back or bottom of the unit.

## 8. DISINFECTION

### 8.1 DISINFECTING THE UNIT

**NOTE** *Always disconnect the power cord before cleaning the system.*

Use any disinfectant agents which are commonly applied while disinfecting surfaces of electric medical equipment. Such disinfectant agents are usually in the form of sprays or damp cloths.

Follow the instructions given by the manufacturer of the disinfectant solution.

## 9. SERVICING AND REPAIR

Defective items of equipment are to be serviced and repaired exclusively by persons authorized by the manufacturer. All repair work shall employ original manufacturer's parts only.

### 9.1 FUSE REPLACEMENT



*Always disconnect power cord and turn main switch off before fuse replacement.*

Turn light source off and unplug power cord. On back of unit remove fuse by turning fuse cover and pulling out fuse. Replace fuse with 2 AMP (1/4" x 1 1/4") time delay 250V rated fuse. Insert back into fuse housing. Re-connect the power cord and turn the LED light source on according to section 6.1.

## 9.2 LIMITED WARRANTY

Your LED light source carries a 1-year warranty from the date of shipment on workmanship and all defects of material. Excluding the lamps. Should your product prove to have such defects within one year of the shipment, **Sunoptic Technologies®** will repair or replace the product or component part without charge. Should your LED Light Source product(s) need servicing under this warranty, please contact, **Sunoptic Technologies®** for return authorization documentation. You should carefully pack unit in a sturdy carton and ship it to the factory. Please include a note describing the defects, your name, telephone number and a return address. Warranty does not cover equipment subject to misuse, accidental damage, normal wear and tear or if transferred to a new owner without authorization from, **Sunoptic Technologies®**. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.

**POST WARRANTY REPAIRS:** You may return your product(s) for repair, shipping prepaid to the factory. Your product will be inspected and an estimate of repair charges will be submitted to you for approval. Payment must be received before repairs are completed.

- In the US: 877 677 2832 (toll free)
- Customer Service 904 7377611
- FAX number: 904 7334832

## 10. END OF PRODUCT LIFE

In accordance with the European Waste from Electrical and Electronic Equipment (WEEE) directive, we encourage our customers to recycle this product whenever possible. Disposal of this unit must be performed in accordance with the applicable local environmental regulations.

In the US a list of recyclers in your area can be found at: <http://www.eiae.org/>.



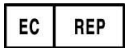



Please contact customer service to issue a return authorization to return product to manufacturer at the end of product life.



## 11. TROUBLESHOOTING

<b>Problem</b>	<b>Solution</b>
<b>The power indicator (referto 4.1) is notlit.</b>	A. Check that the AC power cord isproperly connected. B. Check the unit fuses. If necessary,replace.
<b>The power indicator is lit,but lamp will notignite.</b>	Turnintensitycontrolknobclockwisetoincreaselightoutput intensity

## 12. CHART OF MEDICAL DEVICE SYMBOLSUSED

	Manufacturer
	Date of manufacture (YYYYMM orYYYYY)
	“Authorized Representative”in the EuropeanCommunity
	Caution, consult accompanying documents
Caution: Federal law restricts this device to sale byorontheorderofalicensedhealthcarepractitioner	
	Consult Instructions forUse
	CEmark