



SERVICE MANUAL: LS7700



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Re: Service Disclaimer

Dear Customer:

You have requested service manuals, schematic drawings, operating or calibration specifications or other sourcing information about your ConMed Linatec capital products. We are, therefore, providing you or have already provided you with the items identified on the attached Service Information List.

Please note that the items on the attached list are uncontrolled copies. As a result they are current only as of the date of the attached list and we reserve the right to make any changes without notifying you.

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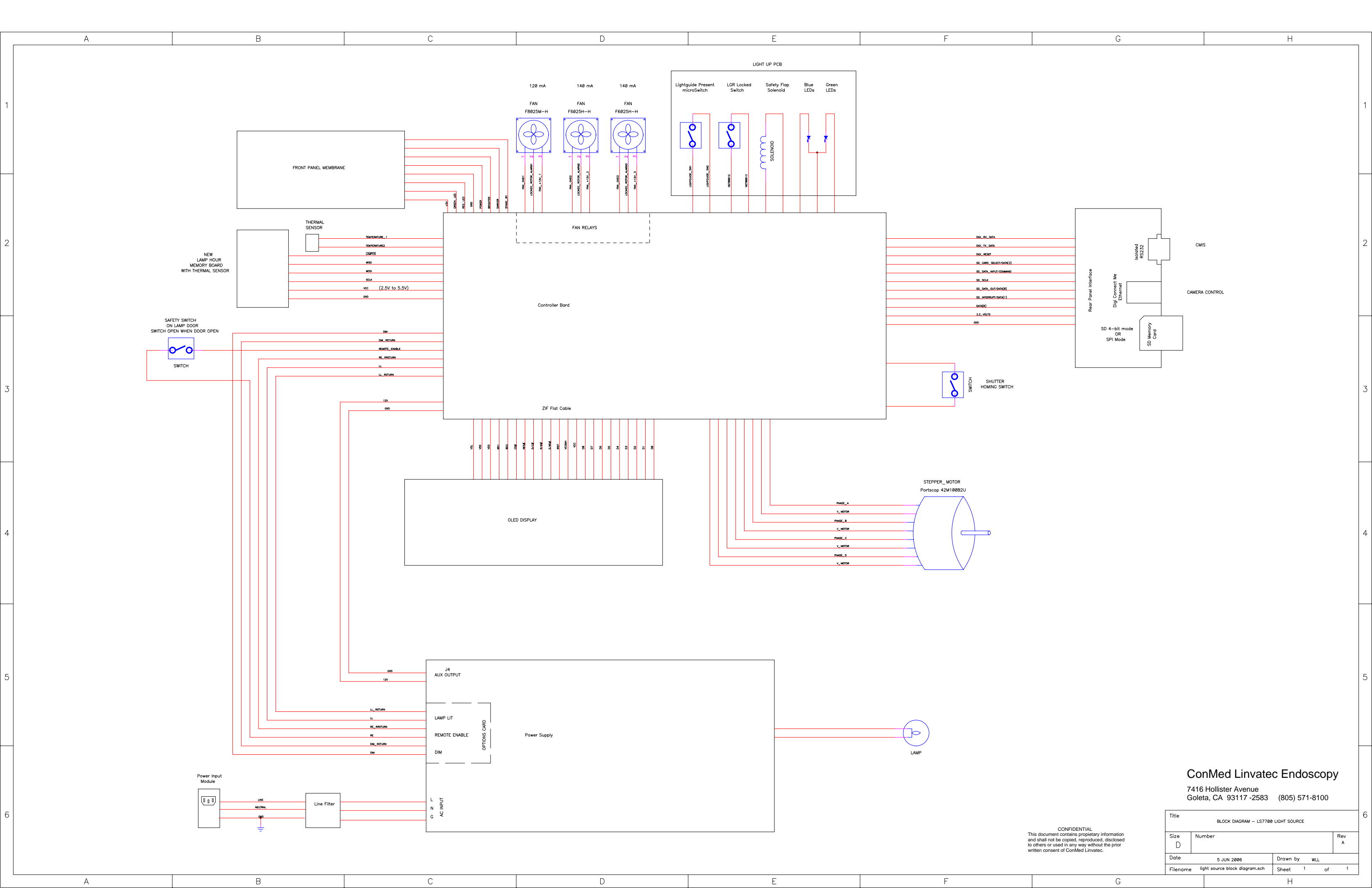
Please understand that successful servicing and/or calibration of your ConMed Linatec product is necessary to achieve optimum product performance and any deviations may adversely impact the function of the device. The risks associated with improper servicing and/or calibration may include, but are not limited to, patient injury, delay of the surgical procedure, injury to the surgeon or surgical staff, and damage to the product and/or other operating room equipment.

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Sincerely

CONMED LINVATEC



ConMed Linvatec Endoscopy
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Title BLOCK DIAGRAM - LS7700 LIGHT SOURCE		
Size D	Number	Rev A
Date 5 JUN 2006	Drawn by WLL	
Filename light source block diagram.sch	Sheet 1	of 1

ConMed Linvatec LS7700 BOM for final assembly
19-Oct-09

Item Seq	Component	Item Description	UOM	Quantity
1	90378	FM,CHASSIS,LS7700	EA	1
2	300268	ASM,PWR ENTRY,18AWG,5IN LS7700	EA	1
3	5008	NUT,4-40M,KEP,SS	EA	6
4	11008	POWER LINE FILTER	EA	1
5	6016	WASHER#8,INT STAR,SS	EA	2
6	6013	NUT,8-32,SM PATT(.250),ALLOY	EA	2
7	54009	FAN,92MM,LS7700	EA	2
8	6018	SCREW,8-32X 1 3/8,BHCS,SS	EA	4
9	19504	SENSOR,THERMO,165 F,ISA,120VAC	EA	1
10	5013	SCRW,4-40x1/4,SS,PAN,	EA	2
11	55059	FGR GD,92MM,MECHATRONICS,ROHS	EA	1
12	6003	NUT,8-32,HEX ACORN,SS	EA	4
13	90383	FM,MOUNT,BAFFLE,LS7700	EA	1
14	90385	Baffle,Fan,LS7700	EA	1
15	6	OP,LOCTITE,#242	EA	0
16	5001	SCRW,4-40x1/4,SHCS,SS	EA	4
17	9014	STDF,F/F,6-32X1.500,HEX W3/8IN	EA	6
18	3002	BOLT,POAG-S,6/20	EA	1
19	7001	WASHER,F/M6	EA	1
20	3004	NUT,MU.5 DM/6	EA	1
21	390770-1	SUB-ASM,FRONT PNL,LS7700	EA	1
22	5505	SCRW,6-32x1/4,SHCS,ALLOY	EA	11
23	390770-3	SUB,ASM,SHUTTER MOTOR	EA	1
24	5502	NUT,6-32,KEP,SS	EA	7
25	18509	PWR SUPPLY,300W,LS7700	EA	1
26	90387	FM,BRACKET,PANDUIT,LS7700	EA	1
27	82545	FM,DUCT,NOMEX,LS7700	EA	1
27	082545-01-01	Nomex Duct	EA	0
28	3074	FLATMOUNT,LATCHING,NYLON	EA	1
29	5526	SCR,6-32 X 1/4,BHCS,SS	EA	1
30	90390	FM,BRACKET,FAN,LS7700	EA	1
31	300267	ASM,CBL,18AWG,RTANGLE,12IN	EA	1
32	300264	ASM,CBL,24AWG,.1IDC,6PIN	EA	1
33	390770-4	SUB-ASM,LAMP PLATFORM,LS7700	EA	1
34	300265	ASM,RBN CBL,20PIN,.039,14IN	EA	1
35	3077	GROMMET,13/32 ID, LS7700	EA	2
36	5512	SCRW,6-32x5/8,SHCS,	EA	6
37	5514	SCRW,6-32x3/8,SHCS,	EA	6
38	82544	FM,PLATE,TOP,LS7700	EA	1
39	11518	CONN,3 PIN,24AWG	EA	2
40	5030	SCR,BHCS,4-40X7/32IN,SS	EA	6
41	3032	WIRE TIE,STANDARD NYLON,4IN	EA	5
42	82548	FM,SHIELD,LIGHT,NOMEX	EA	1
43	10045	SPRING,FLAT,LS7700	EA	1
44	390770-2	SUB-ASM,LAMP,LS7700	EA	1
45	5019	SCREW,4-40X5/16,PAN,SS	EA	2
46	100772	ASSY,PCB,REARPANEL,LS7700	EA	1

47 6004	SCRW,8-32x3/8,SHCS,SS	EA	3
48 5031	SCR,BHCS,4-40X5/32IN,SS	EA	1
49 5046	NUT,4-40 HEX,1/16IN THK,SS	EA	1
50 300767	ASM,RBN CBL,.05 P,20PIN,12.0IN	EA	1
51 10043	GASKET,FRONT PNL,13.4L	EA	2
52 812298	DOC,PROC,ASM,LS7700	EA	0
53 300263	ASM,CBL,18AWG,.156IDC,2PIN,8IN	EA	1
54 390770-9	SUB-ASM,COVER,LS7700	EA	1
55 5540	SCR,6-32,1/2IN L,TORX,PAN,SS	EA	4
56 14503	FEET,RUBBER,3/4 x 9/32	EA	4
57 82541	FM,FOOT SLEEVE,IM4000	EA	4
58 60110	LABEL,UL,CANADA	EA	1
59 61034	LBL,SN,CHASSIS,LS7700	EA	1
60 812300	DOC,PROC,FCO,LS7700	EA	0
61 5035	SCR,4-40X1/4IN,100CSK,FL PHH SS	EA	3
62 5516	SCRW,6-32 X 1-1/8,PAN,SS	EA	4
63 812018	DOC,PROC,ELECTRICAL SAFTY CHK	EA	0
64 840349	DOC,TRAV,LS7700	EA	0
66 28	OP,LOCTITE,BLACK MAX	EA	0
67 8	OP,LOCTITE,TAK PAK,ACCEL	EA	0
68 3010	TIE DOWN,WIRE	EA	1
69 700875	FIXTURE,LS7700 PLATFORM SPACER	EA	0
72 7040	WASHER #6,INTERNAL STAR	EA	2
73 390770-10	SUB-ASM,IGNITER,LS7700	EA	1
74 390773-00-01	Sub-assembly optic LS7700	EA	1
76 82522	SPACER, NOMEX	EA	1
77 812304	DOC,PROC,LAMP CHECK, LS7700	EA	0

FCO, LS7700

812300

Revision AH

SCOPE

This process provides FCO instructions for LS7700 Light Source performed at the chassis area.

REFERENCED DOCUMENTS

Non-Conforming Materials, 816008

LS7700 Traveler, 840349

REQUIREMENTS**1. Responsibility**

- 1.1. Manufacturing Engineering will update and maintain the work instruction when necessary.
- 1.2. Certified Assembler will verify all steps have been completed.
- 1.3. Assemblers using this work instruction to FCO product are required to complete all the steps of this procedure.
 - Observe MSDS guidelines for any chemicals used during assembly.

2. Requirements

- 2.1. Check the manufacturing control computer system to verify document revision is current.
- 2.2. Use forms 840349 (traveler) to record the checks.
- 2.3. If the unit under test does not pass or meet specifications, red tag the unit per work instruction 816008.

3. FCO

- All testing must be complete prior to FCO (communication & safety check).
- Power cycles between Engineering Mode and User Mode requires one-minute delay.

3.1. Power up Checks

3.1.1. Verify proper OLED illumination, Membrane LED's, and power up.

- Cycle AC power
- Verify OLED displays the following
 - ConMed Logo
 - Please wait (momentary)
 - Dark screen

3.1.2. Verify power button LED is illuminated (orange)

3.1.3. Verify the Lamp is off. Look at the side for light.

3.1.4. If the unit passes this check initial form 840349.



FCO, LS7700

812300

Revision AH

3.2. Lamp Life

3.2.1. Press power button, Verify lamp life hours have decreased.

- Power button LED (green)
- OLED displays the following
 - STAND-BY
 - Lamp life : XXX
- Verify the display has decreased the # of hours burned \pm one hour.
- Units that do not decrease fail this test.



3.2.2. Verify light guide ring is green

3.2.3. Verify lamp is on. Look at the side for light.

3.2.4. Record lamp life onto 840349

3.3. STAND-BY Button

- Leave the unit in STAND-BY for minimum of 1 minute.
- Press Standby - OLED displays the following
 - Brightness
 - Set Brightness at 50%.
 - Run for minimum of one minute.
- Verify light guide ring is blue
- Verify lamp is on. Look at the side for light.
- Initial form 840349 if unit passes this check.



3.4. Lever Lock

- Insert light guide into light port
- Lock the lever (turn handle fully clockwise)
- Verify light guide is held securely in place.
- If there is any play (looseness) in the lever this is a fail.
- Remove light guide from unit.
- Initial form 840349 if unit passes this check.



3.5. Verify DOOR OPEN WARNING.

- Turn off power button and open the door
- Turn on power button
- Verify DOOR OPEN displays on screen after approximately 10 seconds.
- Verify the lamp does not light.
- Close the door
- Press the power button

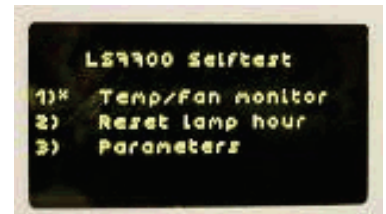


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812300

Revision AH

- Verify STAND-BY illuminates
 - Press STAND-BY
 - Verify Brightness setting at 50%
 - Turn off power button
 - Disconnect AC power cord
 - Initial form 840349 if unit passes this check.
- 3.6. Verify interlock switch adjustment.
- Remove Lamp from the unit.
 - Holdback the door lever and close door listening for the interlock switch to activate.
 - The switch should activate at a doors width (approximately .1)
 - Verify the screw is held firmly in place, (try with fingers to unscrew).
 - Initial form 840349 if unit passes this check.
 - Insert lamp into unit.
- 3.7. Reset the lamp hours. (For service items only reset if applicable for the unit under repair).
- Return to engineering mode per instructions 5.1
 - Select option 2 Reset lamp hour - Press BRIGHTNESS UP
 - Press STAND-BY until Time is selected.
 - Press the Brightness up/down buttons to change the time to 0 (zero).
 - Press the power button
 - Disconnect AC power
- 3.8. Verify Lamp hours are reset. (This step is only if the lamp hours are reset.)
- Apply AC power to the unit.
 - Press the power button
 - Verify LAMP LIFE :500
 - Turn off the unit and disconnect AC power
 - Initial form 840349 if unit passes this check.



FCO, LS7700

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Revision AH

4. Device History Record

- 4.1. A certified operator will review the Device History folder.
 - Complete Device history record checks section of the traveler 840349.
- 4.2. Verify all documents in the folder are complete and pass all requirements.
 - Safety check sheet
 - 840370 Burn - In form
 - PCB travelers
 - 840364 router
 - 840349 traveler
- 4.3. Sign off and Date the Device History Check Verification of 840349.

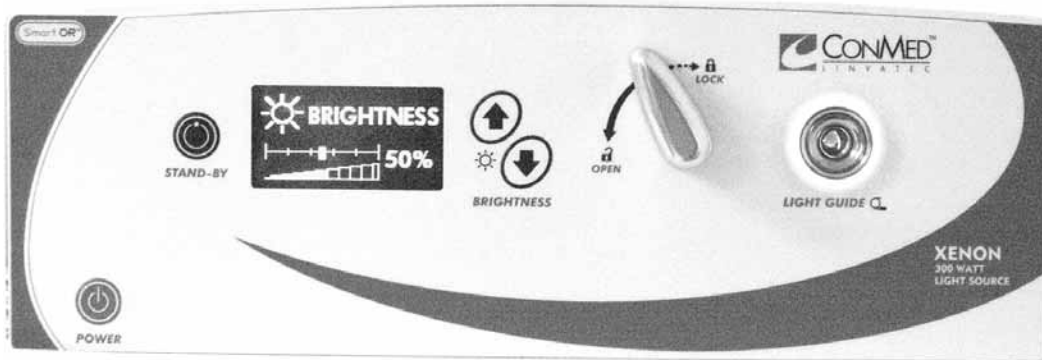
5. Prepare the Unit for Shipment

- Clean the unit and verify no cosmetic damage.
- Remove the green protective sheet from the OLED display.
- Apply a tamper sticker to the bottom of the unit.

6. End of procedure.

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The ConMed Linvatec LS7700 300 Watt Xenon Light Source Instruction Manual



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**Record the Model and Serial Numbers of the light source controller and date received.
Retain for future reference.**

Light Source Model No. _____ Serial No _____ Date _____

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1.0 INTRODUCTION

It is recommended that personnel study this manual before attempting to operate and/or clean the ConMed Linvatec LS7700 300 Watt Xenon Light Source and accessories. The safe and effective use of this equipment requires the understanding of and compliance with all warnings, cautionary notices, and instructions marked on the product, and included in this manual.

1.1 Intended Use

The ConMed Linvatec LS7700 300 Watt Xenon Light Source is intended to be used with an endoscope to provide illumination during endoscopic procedures.


1.2 Safety Information

This equipment is designed for use by medical professionals completely familiar with the required techniques and instructions for use of the equipment. **Read and follow all warning and cautionary notices and instructions marked on the product and included in this manual.**

It is important to read, understand, and comply with all of the following safety precautions. Failure to follow these precautions could result in injury to the patient or user or cause damage to the LS7700 Light Source or associated equipment.

After each use, thoroughly clean the unit and accessories (See “3.2 Cleaning” on page 10).

1.2.1 Warnings

1. Do not attempt to open or service the light source chassis. There are no user-serviceable parts inside.  Removing the cover may introduce an electric shock hazard by exposing you to dangerous high voltages or other risks. If the system malfunctions, return it for service immediately.
2. Use of this light source and the accompanying light guide can cause the scope tip to get hot as a result of high intensity light. Do not allow the light emitting end of the light guide to contact either the patient or the surgical drape. This can cause the drape to ignite and potentially cause severe burns to the patient and / or operating room personnel.
3. Do not use in the presence of flammable anesthetics, gases, disinfecting agents, cleaning solutions, or any material susceptible to ignition due to electrical sparking. There is a possibility of explosion.
4. Do not use a cardiac defibrillator on a patient without first removing from the patient the endoscope to which the light source is attached.
5. Do not use in surgical procedures requiring direct illumination of the eye.
6. This device is designed for use in standard medical environments. Components of the system that are meant for patient contact are constructed from biocompatible materials.

1.2.2 To avoid fire hazard or electrical shock:

1. Prior to each use, the light source and all associated equipment must be inspected for proper operation.
2. Use only non-conducting light guides (optical cable). Verify that the light guide is dry and free from cleaning solution residue before plugging it into the light source.
3. Use only the power cord specified for this device.
4. Do not use plug adapters or extension cords; such devices defeat the safety ground.
5. Do not excessively bend or kink the power cord. Always inspect cords for signs of excessive wear or damage. If wear or damage are found, discontinue use and replace immediately.
6. Unplug the power cord from the outlet when performing any kind of cleaning or general maintenance, such as changing the lamp assembly.
7. Use only the fuse type and rating specified for this device.
8. Do not apply an input voltage that is outside the specified range.
9. Do not operate this product with the cover removed. The lamp access door must be closed and latched for the light source to work.
10. Do not expose the light source to moisture, or operate the light source in either damp or wet areas, or place liquids on or above the light source.

11. Do not operate the light source in an explosive atmosphere.
12. Do not allow foreign objects inside the light source.
13. Do not disassemble the light source. There are no user-serviceable parts inside.
14. Never spill liquids of any kind on the device or immerse it in liquids.
15. Only plug the light source into a properly grounded hospital-grade outlet.

1.2.3 To avoid personal injury and damage to the light source.

1. Do not use the light source with incompatible equipment or accessories that are not authorized by ConMed Linvatec. Doing so may void certifications and/or warranties.
2. Do not place light source on an unstable surface, cart, stand or table.
3. Do not allow the light source to share an electrical outlet or grounding with life supporting or life sustaining equipment.
4. Only connect IEC 60950 or IEC 60601 series compliant devices to signal input or output ports.
5. Do not look directly or indirectly at the lamp when it is on. The lamp produces high intensity visible light that may cause burns to skin or eyes.
6. Do not touch the lamp until it has cooled to room temperature. Severe burn may result.

7. Wear a face shield or safety eye glasses and inspection glove when handling the lamp assembly.
8. Do not leave fingerprints or any other residue on the lamp reflector surface or the bulb.
9. Do not subject the lamp to mechanical forces or rough handling that may fracture the lamp as this may result in an explosion.
10. Do not operate the light source with suspected failures. If you suspect there is damage to this product, have it inspected by qualified personnel.
11. Do not block ventilation slots or openings — provide at least four inches of free air space between the sides of the light source and any hard surface.

1.2.4 Unplug the device from the wall outlet if any of the following occur:

1. The power cord is damaged.
2. Liquid has been spilled on the device or it has been exposed to other moisture.
3. The device has been dropped or damaged in any way.
4. The product displays a distinct change in performance.
5. The product does not operate properly when the operating instructions are followed.

1.3 Receiving Inspection












Upon receipt, carefully unpack the light source and accessories. Ensure all items listed below are included in the box and are free from damage. If any damage is noted contact your ConMed Linvatec Customer Service. Save **ALL** packaging materials; they may be needed to verify any claims of damage by the shipper.













- LS7700 Xenon Light Source:

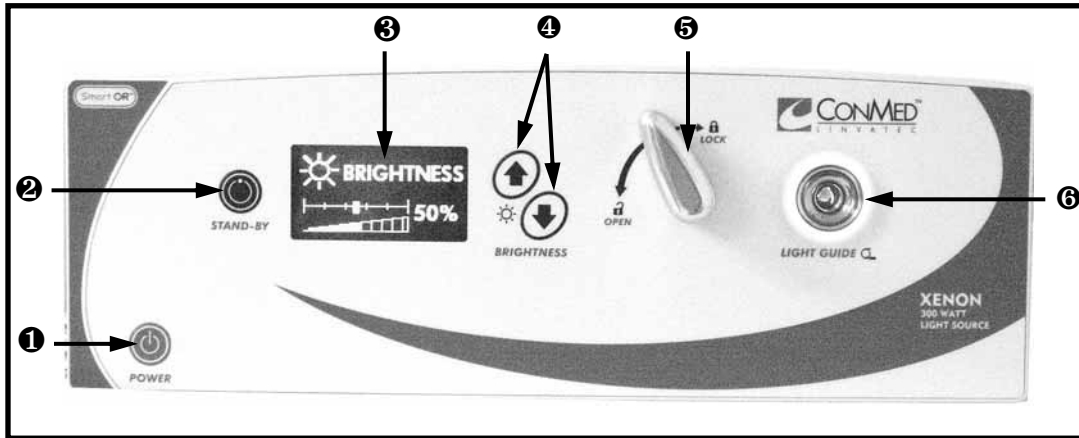
The power cord is sold separately and is packaged in a separate box.

- C7104 Power Cord — 115VAC
- C7105 Power Cord — 230VAC

1.4 Symbol Definitions



	Power (ON/OFF)
	Stand-by
	Attention, consult accompanying documents or contact your ConMed Linvatec representative.
	Caution - Electrical hazard, High voltage
	Caution - Hot surface
	Warning - For continued protection against risk of fire, replace only with same type and rating fuse
	Mains fuse
	Alternating Current
	Flammable Anesthetics - Risk of explosion if used in the presence of flammable anesthetics
	Type BF equipment
	No user service recommended. Refer servicing to qualified ConMed Linvatec service personnel


	Protective Earth (ground)
	Caution: Federal Law restricts this device to sale by or on the order of a physician
	Lamp Life
	Light Guide
	Iso-potential Ground
	Brightness Decrease
	Brightness Increase
	Shutter Control
	Brightness
	Light Guide OPEN
	Light Guide LOCK
	WEEE (Waste Electronics and Electrical Equipment) Symbol. Regarding European Union end-of-life of product




1.5 System Features

1.5.1 Front Panel

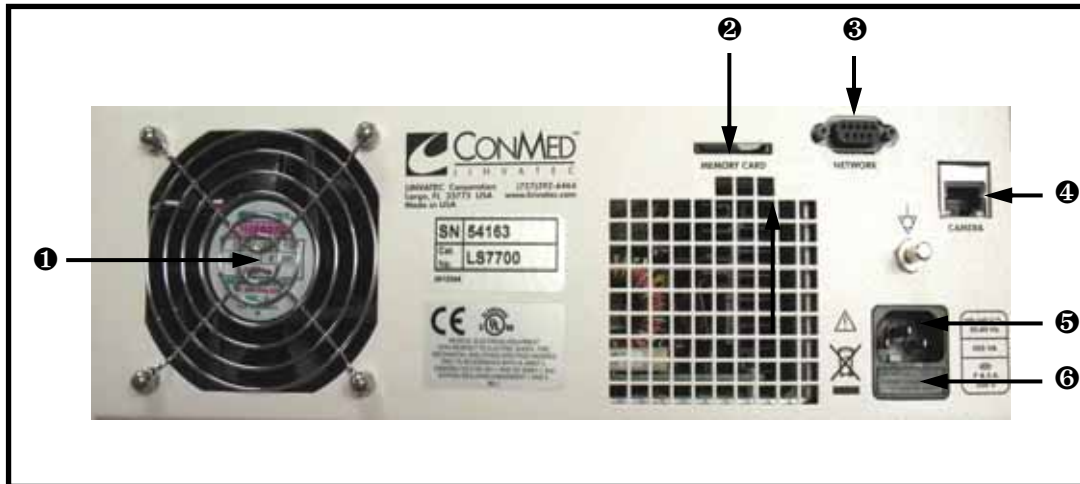
- 1 “POWER” Button** — Allows the user to toggle between light source OFF condition and light source ON condition. The associated “POWER” LED illuminates orange in light source OFF condition and green in light source ON condition. 
- 2 “STAND-BY” Button** — Allows the user to place the unit in stand-by mode to prevent light from exiting the light guide. Pressing the STAND-BY button again will return the brightness level to its previous setting and will allow light to be emitted through the light guide. 
- 3 Organic Light Emitting Diode (OLED) Display** — Displays the settings of the light source such as stand-by mode, brightness level, lamp life hours remaining and power on or off.

- 4 “BRIGHTNESS” Buttons** — Allows the user to increase or decrease the light output. 

- 5 Light Guide Lever** — Allows the user to open the LGR for insertion / removal of a fiber optic light guide. The lever is spring loaded to hold the light guide during use. It also can be used to “lock” the light guide firmly in place.

- 6 Light Guide Receptacle (LGR)** — Accepts and secures the fiber optic light guide. When in stand-by mode the light guide receptacle (LGR) illuminates green. 

NOTE: Only insert clean, dry, non-conductive fiber optic light guides into the light guide receptacle (LGR).



1.5.2 Rear Panel

- ❶ **Fan** — Provides cooling to the Light Source. Keep free of dust and dirt accumulation.
- ❷ **“MEMORY CARD” Slot** — Provides a means for future software upgrades or diagnosis by ConMed Linvatec authorized representatives.
- ❸ **“NETWORK” Connector** — Optional connector that can accept a cable from a ConMed Nurse’s Assistant® (NA) or Surgeon’s Assistant® (SA) to enable external control by an NA or SA.
- ❹ **“CAMERA” Connector** — This connector accepts an ethernet cable only from an optional ConMed Linvatec IM4000 series camera so that camera can control the light source.

- ❺ **Power Cord Receptacle** — Accepts the hospital grade power cord.
- ❻ **Fuse Module** — Houses the fuses. Equipped with two F6.3A, 250V (fast blow) fuses. To replace a fuse, see “3.4 Fuse Replacement” on page 12.

2.0 SYSTEM INSTALLATION and OPERATION

2.1 Installation Instructions

1. Attach the hospital grade power cord to the power cord receptacle on the back panel of the light source, and a hospital grade grounded power outlet. If desired, connect the ethernet cable from the light source connection port to the connection port on the IM4000 series camera.
2. Note: To accommodate some fiber optic light guides, the LGR adapter may need to be removed. To remove the LGR adapter:
 - (a) Insert a coin into the slot of the LGR adapter.




- (b) Rotate the coin counterclockwise until the adapter is fully removed.





2.2 Operation of Light Source


Use the following sequence to operate the light source:

1. Press the POWER button to turn the light source on. The power button LED will illuminate green and the OLED displays "STAND-BY" and remaining LAMP life. 
2. Insert the fiber optic light guide into the LGR.

NOTE: Insert only clean, dry, non-conductive fiber optic light guides into the light guide receptacle (LGR).

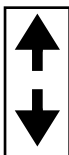
- (a) Fully rotate the Light Guide Lever counterclockwise to the OPEN position. 
- (b) Insert the light guide completely, then rotate the lever counterclockwise until the clicking of the locking mechanism is heard or felt. 



3. Press the STAND-BY button to take the light source out of stand-by mode. This will allow illumination through the light guide. OLED will display the brightness level. 

Warning: Before taking the light source out of stand-by mode, ensure that the output end of the light guide or endoscope is not in proximity to surgical drapes, flammable objects, or to the patient's skin. Operating room personnel or patient injury or burn may result.

4. Press the BRIGHTNESS buttons to set light output to the desired level. OLED will display the set brightness level.



5. To remove the light guide from the LGR:

- (a) Place the light source in stand-by mode by pressing the STAND-BY button.



- (b) Fully rotate the Light Guide Lever counterclockwise to the OPEN position and remove the light guide.



2.3 Description of Features

1. Light Source OFF:
 - When the light source is in the OFF condition, the POWER button LED illuminates orange. Power will continue to run to the unit, but the lamp is not on.
 - STAND-BY and BRIGHTNESS buttons are inactive. Pressing the POWER button will turn the Light Source on.
 - The OLED display is inactive.
2. Light Source ON, STAND-BY mode enabled:
 - When the light source is in the ON condition, the lamp is on and the POWER button LED and LGR illuminate green.
 - The OLED displays “STAND-BY” and remaining Lamp Life Hours.
 - The BRIGHTNESS buttons are inactive.
 - Pressing the POWER button will turn the Light Source OFF.
 - Pressing the STAND-BY button will return the brightness level to its previous setting and will allow light to be emitted through the light guide.
3. Light Source ON, STAND-BY mode disabled:
 - When the light source is in the ON condition, the lamp is on, the POWER button LED illuminates green and the LGR illuminates blue.

- The OLED displays “BRIGHTNESS” via a bar graph in increments of 5%.
 - The BRIGHTNESS Up Arrow increases brightness in increments of 5%.
 - The BRIGHTNESS Down Arrow decreases brightness in increments of 5%.
 - The STAND-BY button returns the light source to STAND-BY mode. The POWER button turns the light source off.
4. Light Source ON, Auto Shutter Control:
- To enable Auto Shutter control, the ethernet cable must be connected between an IM4000 series ConMed Linvatec camera and the light source.
 - The IM4000 series camera head button can enable or disable the STAND-BY mode.
- 4a. When STAND-BY mode is enabled:
- OLED displays “STAND-BY” and remaining lamp life hours.
 - The BRIGHTNESS buttons are inactive. The POWER button will turn the light source OFF. The STAND-BY button returns the light source to Auto Shutter mode.
- 4b. When STAND-BY mode is disabled:
- The BRIGHTNESS buttons are controlled by the IM4000 series camera to achieve the desired picture brightness.
 - The STAND-BY button returns the light source to STAND-BY mode. The POWER button will turn the light source OFF.
5. Lamp Life:
- When the light source is in the ON condition and the STAND-BY mode is enabled, the OLED displays lamp life hours remaining, beginning at 500 hours and counting down to zero in increments of one hour.
 - When lamp life is 10 hours or less, the OLED displays a blinking message to indicate nearing end of life or at end of life.
6. Lamp Replacement:
- For installation instructions see “**3.3 Lamp Replacement**” on page 10.
 - Replace only with ConMed Linvatec Lamps. Use of unauthorized lamps will void certifications and/or warranties and may affect safety and performance.
7. Lamp Door Open:
- Lamp door must be closed for unit to operate.
8. Lamp Saver:
- If light source is in STAND-BY mode, continuously for one hour, the light source lamp will turn off. When STAND-BY mode is disabled, the lamp will turn on and the light source will return to normal operation.

3.0 MAINTENANCE

Regular maintenance of your light source is limited to: 1) keeping the intake vents free of dust and dirt and 2) replacement of the lamp, when needed. No other service is required.

3.1 Life Expectancy

The standard warranty for this product is twelve months. The life expectancy of this product is expected to meet or exceed this period under normal use and standard care.

3.2 Cleaning

1. Unplug the light source and allow it and the fiber optic light guide to thoroughly cool before cleaning.
2. Wipe the exterior of the light source and fiber optic light guide with a clean, soft cloth dampened (not dripping) with a mild detergent. Wipe again with distilled or sterilized water. Dry with a clean, lint-free towel.

3.3 Lamp Replacement

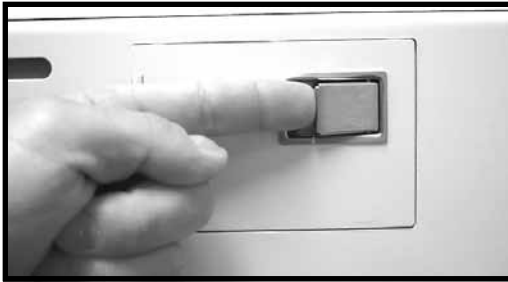
The following maintenance procedures should only be performed by qualified service personnel. Read all warnings and cautionary notices carefully before performing any service procedures.

WARNINGS:

- **Disconnect the main power cord before attempting any service to the lamp or lamp connections.**
- **Wear a face shield or protective safety eye glasses and inspection gloves when handling the lamp.**
- **Do not touch the lamp until it has cooled to room temperature. Severe burn may result.**
- **The Xenon lamp is under extremely high pressure. Do not subject the lamp to mechanical forces or rough handling that could fracture the lamp, as this may result in an explosion.**
- **Do not leave finger prints or any other residue on the lamp reflector surface or the bulb. Contamination on this surface may cause damage to the bulb.**



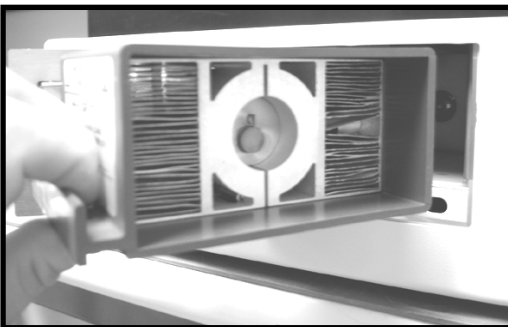
1. Depress the POWER button to the off position.
2. Unplug the light source. Allow to cool before proceeding.
3. Flip the latch on the lamp access door towards the back of the unit and pull the door open.



4. Remove the lamp module by pulling outward.



5. Insert the new lamp module into place until it seats.

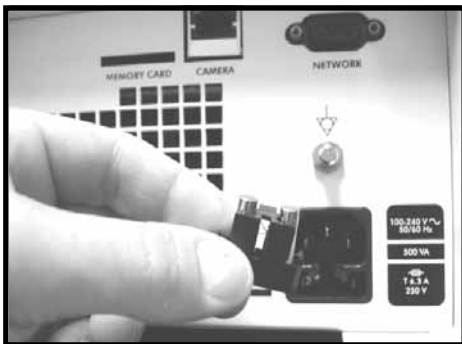


6. After installation is complete, close and secure the door.

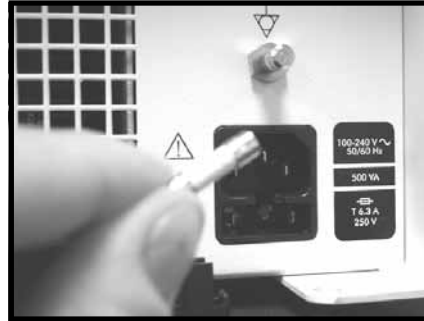
NOTE: Follow local governing ordinances and recycling plan regarding disposal of device components.

3.4 Fuse Replacement

1. Depress the “POWER” button to the off position and unplug the light source.
2. Using a small screwdriver or similar tool, gently release the retention tab on the fuse drawer and slide it out.



3. Pull out existing fuses and replace only with factory supplied fuses as stated on the rear of the unit. Replace both fuses at the same time.



4. Return fuse drawer to compartment, making sure alignment tab is on top. Snap into place.

3.5 Troubleshooting

Symptom	Possible Cause	Corrective Action
Lamp will not ignite.	<ul style="list-style-type: none"> ◆ Power cord is not plugged in or is faulty. ◆ Power is not turned on. ◆ Lamp access door open. ◆ Lamp module is not fully engaged. ◆ Lamp is expired. ◆ System overheats or lamp has expired. 	<ul style="list-style-type: none"> ◆ Plug power cord into receptacle and/or Light Source. ◆ Replace power cord. ◆ Place POWER button in the on position. LED will illuminate green when unit is on. ◆ The Light Source will not work with the lamp access door open. Assure door is completely closed and latched. ◆ Verify lamp assembly is completely engaged on receptacle pins within Light Source. ◆ Replace lamp (see “3.3 Lamp Replacement” on page 10). ◆ Turn power off. Ensure intake vents are not blocked. Allow system to cool for five minutes. Turn power back on. If lamp does not ignite, replace lamp assembly. ◆ Use of unauthorized lamp module. Use only ConMed authorized replacement lamp modules.

Symptom	Possible Cause	Corrective Action
Low light output.	<ul style="list-style-type: none"> ◆ Brightness is set to minimum or too low of an output position. ◆ Fiber optic light guide surface(s) is contaminated or damaged. ◆ Lamp life exceeds warranted life. ◆ Light guide is not engaged properly. ◆ Excessive number of light guide fibers are broken. 	<ul style="list-style-type: none"> ◆ Increase lamp brightness. ◆ Replace light guide. ◆ Check lamp life indicated on OLED. Replace lamp. ◆ Check to ensure light guide is fully inserted into LGR. ◆ Inspect light guide cables. If more than 20% of fibers are broken (darkened), replace light guide.
Lamp is unstable (flashes).	<ul style="list-style-type: none"> ◆ Lamp life exceeds warranted life. ◆ Lamp problem. 	<ul style="list-style-type: none"> ◆ Check lamp life indicated by OLED. Replace lamp. ◆ Replace lamp.

3.6 Theory of Operation

The xenon light source uses a replaceable short arc xenon lamp with an integral elliptical reflector. The lamp is designed to produce a very small high brilliance electric arc in a sealed xenon envelope to simulate the spectral content of sunlight for the best video camera performance. The arc also produces IR (heat) that is filtered by two hot mirrors positioned between the lamp and the light guide.

To operate an arc lamp, a special power supply is needed since the start-up process is not a simple matter of applying power. In the off condition the arc has very high impedance. Therefore, a high voltage (23KV min. balanced) must be applied to develop a conduction path from the anode to the cathode. Following the very high voltage, an intermediate voltage is applied as the impedance of the arc path drops and the arc becomes larger. In the third phase of the start-up sequence the voltage falls between 11.5 - 15 VDC as current regulation takes over to sustain the now fully developed arc. The unit continues to operate in this current regulated mode until the power is removed by the front panel "POWER" button.

The temperature on the surface of the lamp can be very high, therefore, cooling is very important during operation. The lamp must be allowed to cool in accordance with the included instructions before any handling is attempted. The lamp is very fragile and can easily break explosively since the lamp is under high pressure.

The power supply is a switch mode type with a built-in, high voltage lamp ignitor and current regulator. The fans are powered from an auxiliary 12VDC power output of the main supply. An interlock switch in the lamp access door removes power from the fans and lamp supply outputs including all DC and AC voltage and current. When the door is open, power remains connected to the fuses and the two EMI filters inside the unit, as well as some internal components in the power supply. See the schematic diagram for details.

An EEPROM chip mounted on the lamp module tracks lamp life for easy and accurate front panel display. A microcontroller controls two communication ports, all front panel controls and indicators, shutter motor, and lamp life operation. The microcontroller board is powered by the auxiliary 12VDC from the lamp supply.

4.0 TECHNICAL INFORMATION

4.1 Light Source

I.E.C. Equipment Classification: Type BF, Class 1, continuous operation

Typical Operating Requirements:

Input Voltage: 100 - 240 VAC

Input Line Frequency: 50/60Hz

Power Consumption: 500 VA max

Fuse: Fast Blow 6.3 Amps, 250 V

Intensity Control: Manual or Automatic

Weight: 16.0 lbs. (7.26 kg)

Dimensions: 14.0" (W) x 5.2" (H) x 15.1" (D)
35.5cm (W) x 13.2cm (H) x 38.4cm (D)

Power Cable Length: 6 ft. (2m)

ENVIRONMENTAL

Operating: **Ambient Temperature:** + 42° F to 86° F (+ 6° C to 30° C)

Relative Humidity: 30% to 85%

Atmospheric Pressure: 700 hPa to 1060 hPa

Transport and Storage: **Ambient Temperature:** -40° F to 120° F (-40° C to + 49° C)

Relative Humidity: 10% to 100%

Atmospheric Pressure: 500 hPa to 1060 hPa

4.2 Lamp Module

Lamp Type: Xenon Short Arc Lamp

Lamp Power: 300 Watts

Lamp Color Temperature: 5900°K

Lamp Life: 500 Hours Minimum

Power Cord Requirements:

100/120 Volt (Cat. No. C7104)

Use only a listed (UL, CSA) detachable power cord manufactured to the following specifications.

- Plug End
 - NEMA 5-15P hospital grade, 15 amps, 125V
- Receptacle End
 - IEC 320/CEE-22, 6 amps, 250V/15 amps, 125V
- Cord
 - UL style SJT, 14 AWG, 3 conductor

220/240 Volt (Cat. No. C7105)

- Plug End
 - Molded straight PVC plug with double grounding system
 - DIN 49441, CEE 7/U11, 10/16A, 250V
 - CEBEC, DEMKO, KEMA, NEMKO, OVE, SEMKO, VDE, UTE, FEMKO
- Receptacle End
 - Molded straight PVC plug
 - DIN 49457, CEE 22/V, 10A, 250V
 - VDE, D, N, S, SEV, OVE, KEMA
- Cord
 - PVC, 7.2mm diameter
 - 10A, 250V
 - Conductors: 3 x 1 mm²
 - Conductor Colors - brown, blue, green/yellow stripe

NOTES:

- 1. If the product is connected to a 240V system in the United States, then it must be connected to a center tap system.**
- 2. This light source contains electronic components and may require special handling for end-of-life disposal. Refer, for example, to Directive 2002/96/EC (WEEE guidelines) for disposal in the European Union or other local guidelines regarding disposal of electronic components.**

Table 1: Guidance and Manufacturer’s Declaration - Electromagnetic Emissions

<p>The ConMed Linvatec LS7700 Light Source is intended for use in the electromagnetic environment specified below. The customer or the user of the LS7700 Light Source should assure it is used in such an environment.</p>		
Emissions Test	Compliance	Electromagnetic environment - guidance
RF Emissions CISPR 11	Group 1	The LS7700 Light Source 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 B	The LS7700 Light Source is suitable for use in all establishments, including domestic establishments 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	

Table 2: Guidance and Manufacturer’s Declaration - Electromagnetic Immunity

The ConMed Linvatec LS7700 Light Source is intended for use in the electromagnetic environment specified below. The customer or the user of this LS7700 Light Source 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	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV 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 transients / bursts IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line to line ± 2 kV lines to earth	± 1 kV line to line ± 2 kV lines to earth	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency (50/60 Hz) magnetic field 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 environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 seconds	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LS7700 Light Source requires continued operation during power mains interruptions, it is recommended that the LS7700 Light Source be powered from an uninterruptable power supply or battery.
Note: U_t is the a.c. mains voltage prior to application of the test level.			

Table 2: Guidance and Manufacturer’s Declaration - Electromagnetic Immunity

The ConMed Linvatec LS7700 Light Source is intended for use in the electromagnetic environment specified below. The customer or the user of this LS7700 Light Source 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 no closer to any part of the LS7700 Light Source, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
			Recommended Separation Distance
Conducted RF	3 Vrms	3 Vrms	$d = 1.2 \sqrt{P}$
IEC 61000-4-6	150 kHz to 80 MHz	150 kHz to 80 MHz	
Radiated RF	3 V/m	3 V/m	$d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz
IEC 61000-4-3	80 MHz to 2.5 GHz		$d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz
			<p>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).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey ^a, should be less than the compliance level in each frequency range ^b.</p>

Table 2: Guidance and Manufacturer’s Declaration - Electromagnetic Immunity


<p>The ConMed Linvatec LS7700 Light Source is intended for use in the electromagnetic environment specified below. The customer or the user of this LS7700 Light Source should assure that it is used in such an environment.</p>			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic environment guidance
			<p>Interference may occur in the vicinity of equipment marked with the following symbol.</p> 
<p>Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and/or people.</p>			
<p>a Field strengths from fixed transmitters, such as base stations for radio (cellular / cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast 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 LS7700 Light Source is used exceeds the applicable RF compliance level above, the LS7700 Light Source should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the LS7700 Light Source.</p> <p>b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

Table 3: Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the LS7700 Light Source

<p>The ConMed Linvatec LS7700 Light Source is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LS7700 Light Source can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LS7700 Light Source as recommended below, according to the maximum output power of the communications equipment.</p>			
Separation Distance According to Frequency of Transmitter			
m			
Read Maximum Output Power of Transmitter	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
W	$d = 1.2 \sqrt{P}$	$d = 1.2 \sqrt{P}$	$d = 2.4 \sqrt{P}$
0.01	0.012	0.012	0.024
0.1	0.12	0.12	0.24
1	1.2	1.2	2.4
10	12	12	24
100	120	120	240
<p>For transmitters rated at a maximum output power not listed above, the recommended separation distances 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.</p>			
<p>Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.</p>			

4.3 Accessories / Compatible Equipment

300 Watt Xenon Light Source	LS7700
300 Watt Replacement Lamp	LS7701
5mm Universal Light Guide Cable	C3278 *
5mm Universal Light Guide Cable	LG1050 *
Wolf, Dyonics Scope Fitting	7451
ACMI Scope Fitting	7452
Weck Scope Fitting	7462
Storz, Olympus Scope Fitting	7453
Wolf / Dyonics Light Source Fitting	7455
ACMI / Stryker Light Source Fitting	7456
Storz / Linvatec Light Source Fitting	7457
Olympus Light Source Fitting	7458
IM4000 Camera System	IM4000
Power Cord 115 VAC	C7104
Power Cord 230 VAC	C7105

* It is recommended that these light guide cables be used with either a 7455, 7456, 7458, or 7462 scope fitting.

4.4 Customer Service

4.4.1 Assistance

If you need technical assistance regarding the use or application of this product, or you encounter a problem that requires servicing or repair, contact ConMed Linvatec Customer Service at 800-925-4255 or your ConMed Linvatec Sales Representative. Outside the U.S. contact your local ConMed Linvatec Representative.

Report any events involving injuries or malfunctions to the ConMed Linvatec Regulatory Affairs Department.

4.4.2 Repairs

Products returned for any reason must have an authorized Return Goods (R.G.) number prominently displayed on the box and included on all paperwork. Refer to this number if making inquiries about repair status. Please call ConMed Linvatec Customer Service and provide the following information to obtain an R.G. number prior to returning any product for repair:

- Product Number
- Serial/Lot Number - if applicable
- Original Invoice Number
- Date of Purchase
- Detailed description of the problem

All returns should be sent to:

**ConMed Linvatec
Attn.: Customer Service Dept.
7416 Hollister Avenue
Santa Barbara, CA 93117 USA**

Customer Service

(within U.S.)	Phone:	800-925-4255
	FAX:	727-399-5256
(outside U.S.)	Phone:	727-392-6464
	FAX:	727-397-4540

ConMed Linvatec Regulatory Affairs

(within U.S.)	Phone:	800-237-0169
(outside U.S.)	Phone:	727-392-6464



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Largo, FL 33773-4908

(727) 392-6464

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