



# FOCUSING ON WHAT'S IMPORTANT

By providing effortless operation and optimum lighting, our light allows surgeons to comfortably focus on delivering the best outcome for the patient without needing to make tedious adjustments.

**L Series Surgical Light**

**AMTAI**  
USA



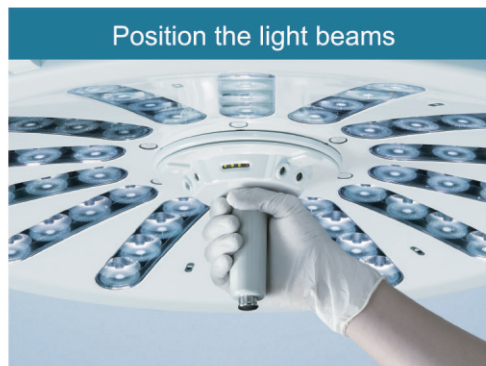


**AMTAI**  
**USA**



## Effortless Operation: Using only the sterile handle, the surgeons c

Patent pending





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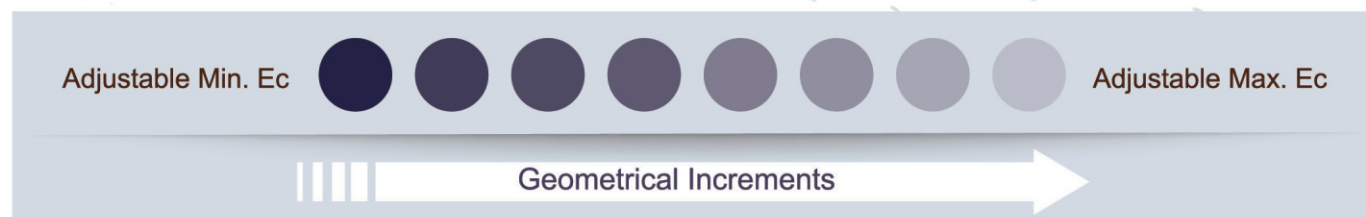


# Optimum Lighting

## Adjustable Illumination

The range of adjustable central illumination ( $E_c$ ) of L Series is between 160,000 Lux and 40,000 Lux. When entering the fine-tuning mode, both the maximum  $E_c$  and minimum  $E_c$  can be tuned in the field by service engineers and end-users to any desired level to match the intensity of ambient illumination in the operating room. The central illumination ( $E_c$ ) has an intensity of 8 geometrical increments from the lowest to the highest. These features and the uniform light patch can reduce visual disturbance and eye fatigue.

US Patent: US9763299B1



## Natural Colors

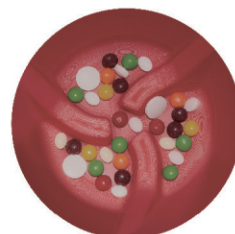
Phosphor-coated LED chips are used to generate natural white light. The L Series does not present the colored shadows or color-shifting effects of multiple-color LEDs, thus eliminating the need to adjust color temperature during surgery. The natural color rendering of consistent and high CRI (both  $R_a$  and  $R_9$ ) over the entire light patch allows surgeons to accurately and consistently recognize tissues and vessels in an effort toward working out the best possible outcome for the patient.



CRI=90

CRI=80

CRI=51



▪ High CRI ▪ Low  $R_9$



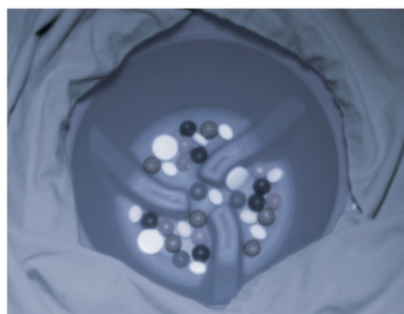
▪ High CRI ▪ High  $R_9$

## Shadow Dilution

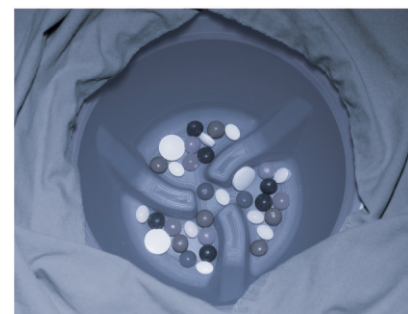
14 strips of LEDs aligned radially toward the center provide the optimal balance between shadow dilution and flat field effect. Such a design can effectively dilute contrast shadows caused by the surgeon's head and shoulders, while retaining enough contoured shadows in the surgical lighted field for the surgeon to clearly recognize the three-dimensionality of tissue and vessel. This optical design greatly helps in reducing eye fatigue of the surgeon.



Objects with contrast shadow and contour shadow



Objects with diluted contrast shadow and over-diluted contour shadow



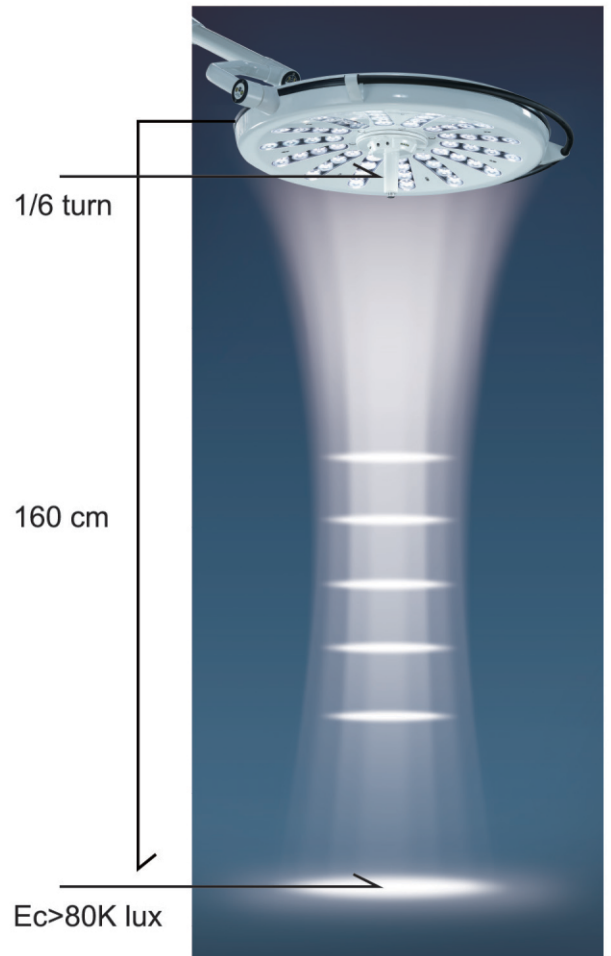
Objects with diluted contrast shadow and adequate contour shadow

## Deep Cavity Illumination

The accurate color rendering of the natural white light and special LED arrangement allow the side and bottom of a deep cavity to receive sufficient natural light of high color rendering. This greatly reduces the need to move surgical lights and adjust lighting parameters during deep cavity surgery.

## Continuous Illumination Column

L Series lights focus the light beams at different planes to form a continuous illumination column over the entire height range of most surgical tables on the market. Surgeons can focus on performing the surgery without re-focusing the light. For a focusable light head, this continuous illumination column can be shifted up and down by turning the sterile handle only 1/6 turn, which provides a focused light patch at 160 cm with an  $E_c$  over 80,000 lux. This feature effectively satisfies the need for surgical procedures requiring more space between the light head and operating field.





# Glare-free Secondary Optics Design

The secondary optics of the L Series do not create glare in the surgeon's eyes. Therefore, without the glaring light, the surgeons can easily focus on performing the surgery.

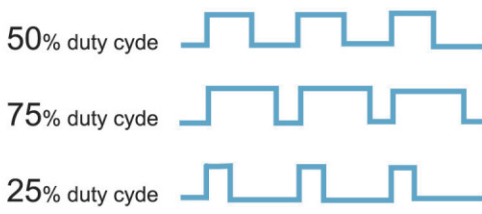
US Patent: US8267553B2



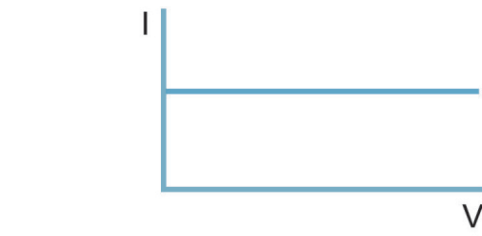
# Non-flickering LED

Most LED surgical lamps on the market use digital PWM to drive LED chips and adjust their luminous intensity. Therefore, there is a high-frequency flicker in their lighting, which causes the camera output screen to produce moiré pattern. The L Series uses a patented digital dimming and analog circuit to supply continuous current to the LED chips. Therefore, the illumination does not flicker, nor does it produce moiré pattern on the camera output screen.

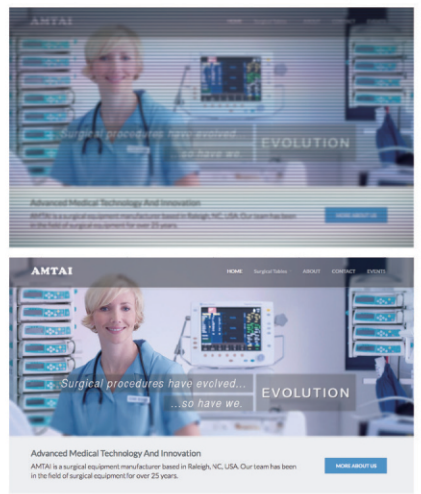
US Patent : US10190735B1



Digital PWM



Continuous current

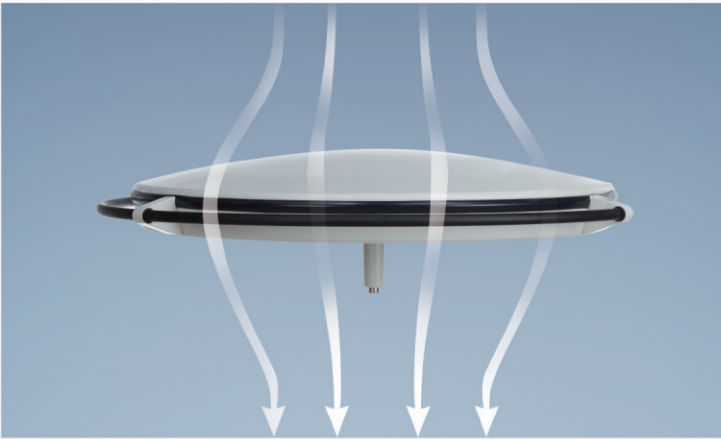






## Excellent Maneuverability of the suspension arms and light heads

The perfectly-engineered suspension system allows doctors to easily relocate the light heads to the desired position, minimizing the chance of collision. The lightweight light heads remain balanced, thus enabling doctors to position them precisely without drifting during surgery.



## Priority in Patient Safety

All light heads can be easily cleaned and disinfected, due to their smooth and sleek surface design. This design, paired with the low surface temperature of the light heads, makes them compatible with laminar flows.

L Series fully complies with the requirements of the applicable IEC standards, guaranteeing total safety for both the surgical staff and patient.

There are wall-mounted controllers and optional infrared remote control available. This allows circulating personnel to control the lights and camera, to avoid entering the sterile field, thereby reducing the risk of patient infection.

## Support for 4K Video

The camera handle and embedded video cables support up to 4K video signal to provide superior quality display.

## Focused Ambient Illumination

Focused ambient illumination mode of natural white light with low intensity (adjustable to 8 levels) and high CRI is provided for the surgical team without causing glare on the monitors. Its high CRI natural white light and 140 cm light patch diameter provide plenty of light for the anesthetist to observe the patient, making it ideal for endoscopic surgery.







# Intelligent Illumination

## The Compensation Mode of AES

In compensation mode, the LED cluster(s) blocked by surgeon's head will be turned off and the light intensity of the remaining LED clusters will be boosted up to retain consistent light intensity in the surgical field.

US Patent: US9638406B1

## The Standard Mode of AES (Automatic Energy Save)

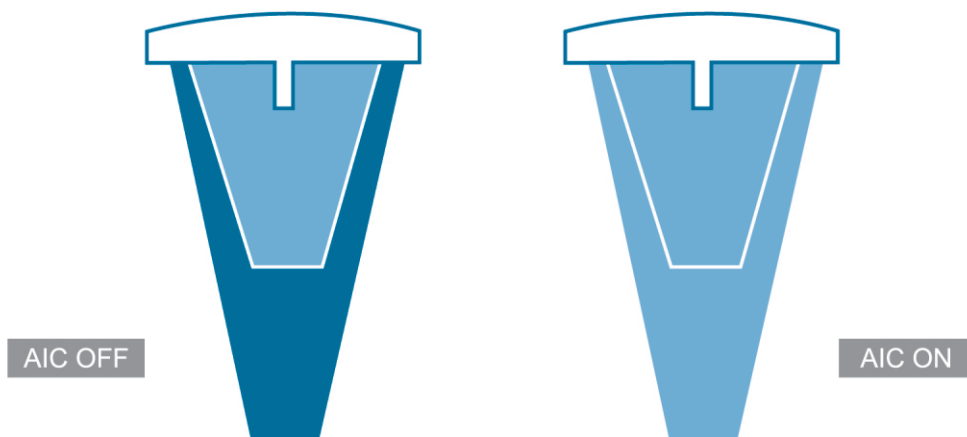
In standard mode, the LED cluster(s) blocked by surgeon's head will be turned off for saving energy and preventing the surgeon from sweating. Up to half of all LED clusters can be turned off.

US Patent: US9638406B1

## AIC (Automatic Intensity Compensation) Function

With AIC function activated, the light intensity of LED clusters can be automatically boosted to gain stronger light intensity in the surgical field if the focal plane of the LED cluster(s) is adjusted farther from the light head. For surgical procedures requiring more space between the light head and surgical field, AIC provides enhanced light intensity.

US Patent: US9920922B2



## Activate AES's compensation mode and AIC function at the same time

AES and AIC can be turned off or activated. When both are activated at the same time, the drive current of each LED cluster will not exceed its allowable rating. When the drive current cannot support both functions at the same time, the AES has the priority.

## Technical Data

| Specifications                                | Lamp Type  |        |
|---|--|--------|
|   | R625   | R725   |
| Diameter of light head (cm)                   | 62.4   | 72.4   |
| Maximum Central illuminance (Ec), (lx) @1M    | 120K ~ 160K adjustable   |        |
| Minimum Central illuminance (Ec), (lx) @1M    | ≥ 40K adjustable   |        |
| Light Intensity adjustment                    | 8-level geometric increments                                       |        |
| Light field diameter d10 @1M, (cm)            | 18   | 21     |
| D50 @1M, (cm)                                 | 11   | 13.4   |
| Adjustable d10 @1M, (cm)                      | 18~25*   | 21~ 25 |
| Light distribution, d50/d10                   | 61%  | 64%    |
| Depth of Illuminance, L1+L2(cm), 60%          | 50   | 62     |
| Remaining illuminance with one mask           | 54.1%  | 59.1%  |
| Remaining illuminance with two masks          | 44.8%  | 45.6%  |
| Remaining illuminance with tube               | 100%   |        |
| Remaining illuminance with one mask and tube  | 54.1%  | 59.1%  |
| Remaining illuminance with two masks and tube | 44.8%  | 45.6%  |
| Color temperature, (° K)                      | 4,000 ± 250  |        |
| Color Rendering Index Ra / R9                 | ≥ 95/95  |        |
| Total Irradiance (W/m <sup>2</sup> )          | 550  |        |
| Ee/Ec, (mW/m <sup>2</sup> • 1x)               | 3.44   |        |
| Power Consumption (W) @ 160K lux without AIC  | 74   | 83     |
| Number of LED for surgical illumination       | 42   | 56     |
| Average LED life (hrs)                        | Up to 60,000   |        |
| Ec, for Ambient illumination @ 1M (Lux)       | 8 levels from 150 to 500   |        |
| d10 @ 1M, for Ambient illumination (cm)       | 140 fixed  |        |
| Optional Functions                            | AES (Automatic Energy Saving)<br>AIC (Automatic Intensity Control) |        |
| Optional control                              | IR remote control  |        |

\*Models with C type light head, its light spot diameter cannot be adjusted.

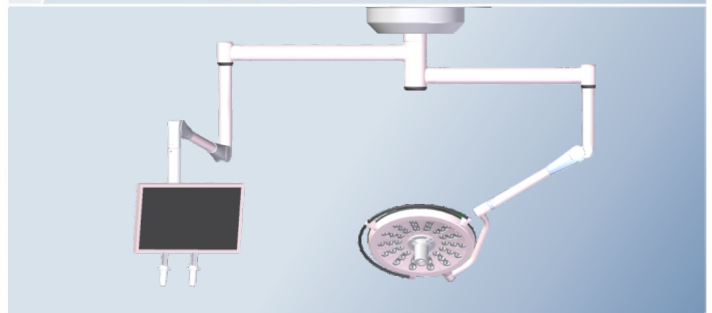
\*\* The specifications may change without notice. Please contact sales@amtai.com for the latest specifications.



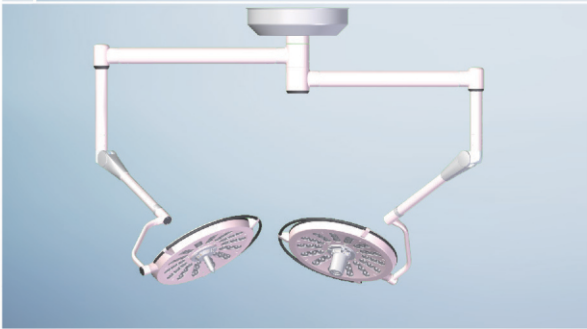
1 1 Suspension Arm + 1 Lamp



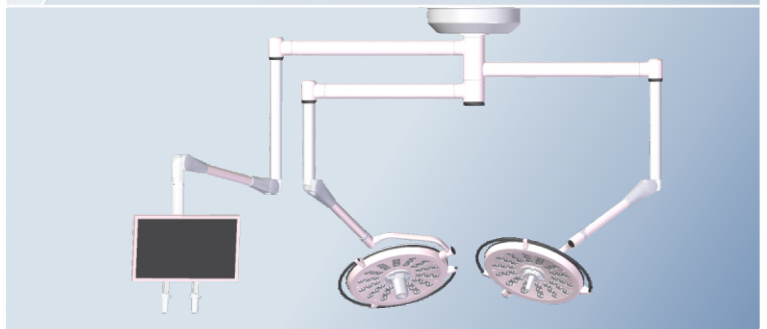
2 2 Suspension Arms + 1 Lamp



3 2 Suspension Arms + 2 Lamps



4 3 Suspension Arms + 2 Lamps



5 3 Suspension Arms + 3 Lamps



6 4 Suspension Arms + 2 Lamps



7 4 Suspension Arms + 3 Lamps



## Flexible Configuration

The following features of the suspension system for L Series provide the optimal configuration flexibility to meet the needs of most modern surgeries.

- Select from 1 to 4 extension arms with spring arms.
- Select up to 3 light heads.
- Select up to 2 LCDs.
- Both the extension and spring arms can rotate 360° regardless of whether the light head is camera-ready or not.
- Both the extension and spring arms of LCD monitor can rotate up to 330°.

# Model Numbers

Each model number is formed by the 4 parts as listed in the table below:

| 1st Part       | 2nd Part (one code per arm) |          |          |          | 3rd Part      |         | 4th Part                     |
|----------------|-----------------------------|----------|----------|----------|---------------|---------|------------------------------|
| Arm type       | Type of Lamp or LCD Arm     |          |          |          | Input Voltage |         | Optional Functions AES & AIC |
|                | 1st Arm*                    | 2nd Arm* | 3rd Arm* | 4th Arm* | 110 Vac       | 220 Vac |                              |
| <b>LS(L)1-</b> | B, C, D                     |          |          |          | -1            | -2      | (I)                          |
| <b>LS(L)2-</b> | B, C, D                     | B, D, A  |          |          |               |         |                              |
| <b>LS(L)3-</b> | B, C                        | B, D     | A, B, D  |          |               |         |                              |
| <b>LS(L)4-</b> | B, C                        | B, D     | A, B, D  | A        |               |         |                              |

\* Sequence from bottom to top.

## 1st Part

LS1-: Plate-mount surgical light with 1 extension arm  
 LS2-: Plate-mount surgical light with 2 extension arms  
 LS3-: Plate-mount surgical light with 3 extension arms  
 LS4-: Plate-mount surgical light with 4 extension arms  
 LL1-: Tube-mount surgical light with 1 extension arm  
 LL2-: Tube-mount surgical light with 2 extension arms  
 LL3-: Tube-mount surgical light with 3 extension arms  
 LL4-: Tube-mount surgical light with 4 extension arms

## 2nd Part

A: LCD spring arm (without LCD and mounting bracket)  
 B: Lamp R625 (focusable)  
 C: Camera-ready lamp R625 (fixed-focus)  
 D: Lamp R725 (focusable)

## 3rd Part

-1: Input voltage = 110 Vac  
 -2: Input voltage = 220 Vac

## 4th Part

(I): Optional functions AES and AIC

Note:

AES = Automatic Energy Saving

AIC = Automatic Intensity Control (not available for camera-ready lamp)

## Optional Components

| Item ID            | Item Name   |
|--------------------|---|
| <b>ASM1222</b>     | LCD Bracket Assembly  |
| <b>ASM1098</b>     | IR Remote Controller  |
| <b>ASM1146</b>     | Communication PCB Assembly for IR Receiver                            |
| <b>ASM1200</b>     | Camera Handle (Sony FCB-EV7100 camera module)                         |
| <b>ASM1059</b>     | Camera Handle w/o IR Sensor (Sony FCB-EV7100 camera module)           |
| <b>ASM1135</b>     | IR Receiving PCB Assembly   |
| <b>ASM1055</b>     | Handle Assembly without IR Sensor                                     |
| <b>ASM1056</b>     | Focus Handle Assembly without IR Sensor                               |
| <b>ASM1057</b>     | Camera Handle Assembly without IR Sensor                              |
| <b>CP010683</b>    | IR Sensor Cable for Plate-mount Surgical Light                        |
| <b>CP010714</b>    | IR Sensor Cable for Tube-mount Surgical Light                         |
| <b>CP010601</b>    | Coaxial Cable (BELDEN 1694A) x 1.5 Meters                             |
| <b>CP010676</b>    | Coaxial Cable (BELDEN 1694A) x 15 Meters                              |
| <b>CP010677</b>    | HDMI Optical Fiber Cable x 15 Meters                                  |
| <b>LCD Monitor</b> | We only provide compatibility test of monitor(s) to our light system. |

## Intended Use

The system can be installed on the ceiling of an operating room or an emergency operating room with air conditioning and room temperature below 25° C (77° F) and is intended for use in the intraoperative illumination of major surgery, emergency surgery, or therapy. In additional LCD monitor(s) suspension, the device also provides adequate high color rendering index illumination and dilutes the shadow of surgeon's head and shoulders in the surgical field, especially in deep cavity surgery.

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