



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.

LM Series Mobile Surgical Light

AMTAI
USA

Effortless Operation: Using only the sterile handle, the surgeons can



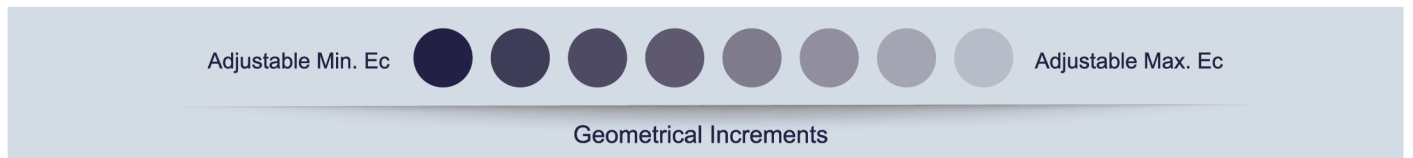
Patent pending

Optimum Lighting

Adjustable Illumination

The range of adjustable central illumination (Ec) of LM Series is between 160,000 Lux and 40,000 Lux. When entering the fine-tuning mode, both the maximum Ec and minimum Ec 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 (Ec) 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 LM 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 Ra and R9) 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 R9



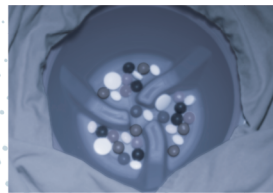
• High CRI • High R9

Shadow Dilution

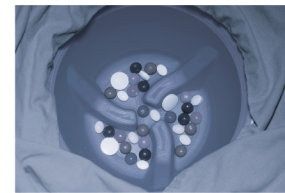
14 strips of LEDs aligned radially toward the center provide the optimal balance between shadow dilution and flat field effect. Such a design can effectively dilute contrast shadows caused by the surgeon's head and shoulders, while retaining enough contoured shadows in the surgical lighted field for 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

LM 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

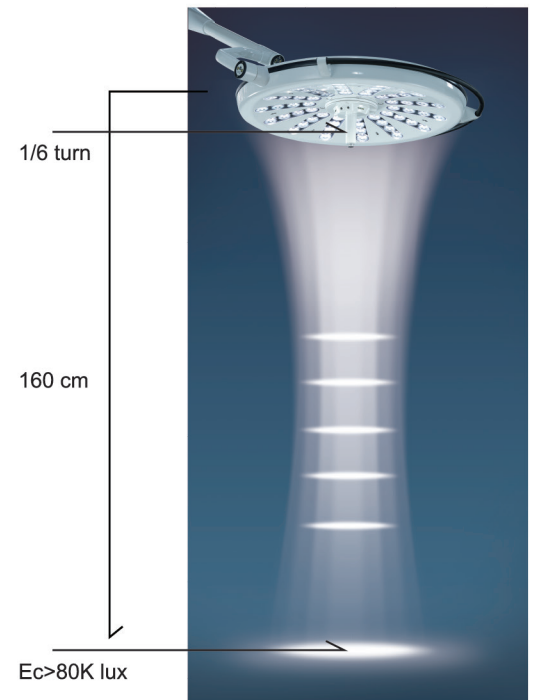
The secondary optics of the LM Series do not create glare in the surgeon's eyes. Therefore, without the glaring light, the surgeons can easily focus on performing the surgery.

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. The LM Series uses a patented digital dimming and analog circuit to supply continuous current to the LED chips. Therefore, the illumination does not flicker.

US Patent : US10190735B1



Excellent maneuverability of LM Series mobile surgical light

LM Series mobile surgical light can be moved easily between operating rooms just by unlocking its four large swivel casters. The lightweight light head always remains balanced on the perfectly-engineered suspension system, thus enabling doctors to position it precisely without it drifting during surgery.

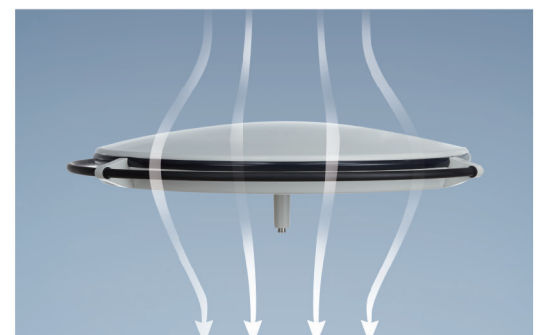


Priority in Patient Safety

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.

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

There is an optional infrared remote control available (ASM1098, IR Remote Controller). This allows circulating personnel to control the light head from a distance, to avoid entering the sterile field, thereby reducing the risk of patient infection.



Built-in Battery Power

The built-in battery power is a standard feature of LM Series mobile surgical light. When AC power supply is available and the mobile surgical light is not in use, the built-in battery set will be charged automatically. When AC power supply is not available, the built-in battery power will supply DC power to the LM Series mobile surgical light.



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)

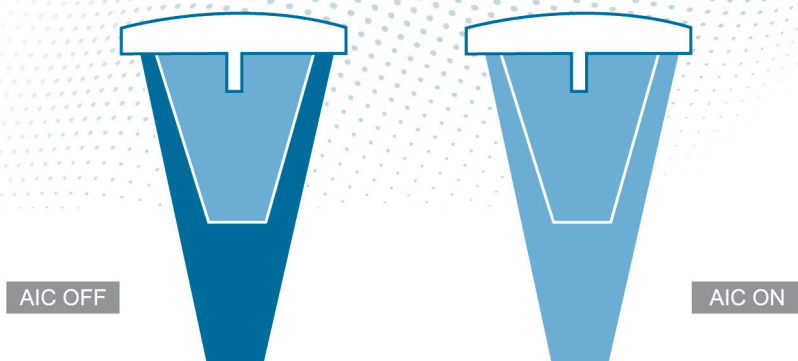
In standard mode, the LED cluster(s) blocked by surgeon's head will be turned off for saving energy and preventing the surgeon from sweating. Up to half of all LED clusters can be turned off.

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

Technical Specifications	Type of Light Heads	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		Geometric increase with 8 levels from minimum to maximum	
Light field diameter d10 @1M, (cm)		18.7	18.6
D50 @1M, (cm)		9.55	9.5
Light distribution, d50/d10		50.8%	
Adjustable d10 @1M, (cm)		18.7 ~ 25	18.6 ~ 25
Depth of Illuminance, L1+L2(cm), 60%		45.6	56.7
Depth of Illuminance, L1+L2(cm), 20%		84.4	83.4
Remaining illuminance when beam is obstructed by one mask [%]		48.2%	57.3%
Remaining illuminance when beam is obstructed by two masks [%]		43.1%	44.3%
Remaining illuminance inside at the bottom of a standardized tube [%]		100%	
Remaining illuminance inside at the bottom of a standardized tube Beam obstructed by one mask [%]		48.2%	57.3%
Remaining illuminance inside at the bottom of a standardized tube. Beam obstructed by two masks [%]		43.1%	44.3%
Color temperature, (° K)		4,150 ± 250	
Color Rendering Index Ra / R9 @Ec		≥ 93 / 95	
Total Irradiance (W/m2)		530.1	458.63
Ee/Ec, (mW/m2 · lx)		3.4	3.0
Power Consumption (W)		93@160k	90@160k
Number of LED for Illumination		42	56
Maximum Power Consumption @ Ec=160K lux with AIC		93 VA	90 VA
Maximum Power Consumption @ Ec=160K lux without AIC		60 VA	58 VA
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 ± 10 fixed	
Built-in Batteries		Two lead-acid batteries ; 12 Vdc / 50 Ah for each	
Battery Charging Time (from empty)		≤ 4 hours to 90% full, ≤ 6 hours to 100% full	
Battery Use Time (from 100% full)		≥ 7.5 hours @ maximum intensity	
Optional Functions		AES (Automatic Energy Saving), AIC (Automatic Intensity Control)	
Optional control		IR remote control	

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

Model Numbers

The available model numbers are listed in the table below:

Model Numbers	Description
LM-B-1	Mobile Surgical Light R625, 110 Vac
LM-B-2	Mobile Surgical Light R625, 220 Vac
LM-B-1(I)	Mobile Surgical Light R625, 110 Vac, with AIC+AES
LM-B-2(I)	Mobile Surgical Light R625, 220 Vac, with AIC+AES
LM-D-1	Mobile Surgical Light R725, 110 Vac
LM-D-2	Mobile Surgical Light R725, 220 Vac
LM-D-1(I)	Mobile Surgical Light R725, 110 Vac, with AIC+AES
LM-D-2(I)	Mobile Surgical Light R725, 220 Vac, with AIC+AES

Intended Use

This medical device is mobile in nature and can be used in an operating room or emergency room with air conditioning that is capable of setting the room temperature below 25°C (77°F); it provides high CRI illumination for minor surgery or treatment and is capable of diluting the shadow cast by head and shoulders, especially in deep cavities within the surgical field.

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