



# Maquet PowerLED II Surgical Light

Driving surgical efficiency to the next level

This document is intended to provide information to an international audience outside of the US.

GETINGE 







# Consistent illumination

to improve  
patient safety

The belief that better illumination results in better patient outcomes led to the development of the Maquet PowerLED II Surgical Light.

Maquet PowerLED II ensures the clearest and brightest light for surgeons, without distractions from glare. Built on the proven PowerLED platform that you've trusted for a decade, we've integrated innovative solutions that improve working conditions in your OR.

Maquet PowerLED II provides constant, clear, shadow-free illumination for precise tissue visualization. You can deliver better patient outcomes with our best-in-class lighting technology.

## **Putting patients first**

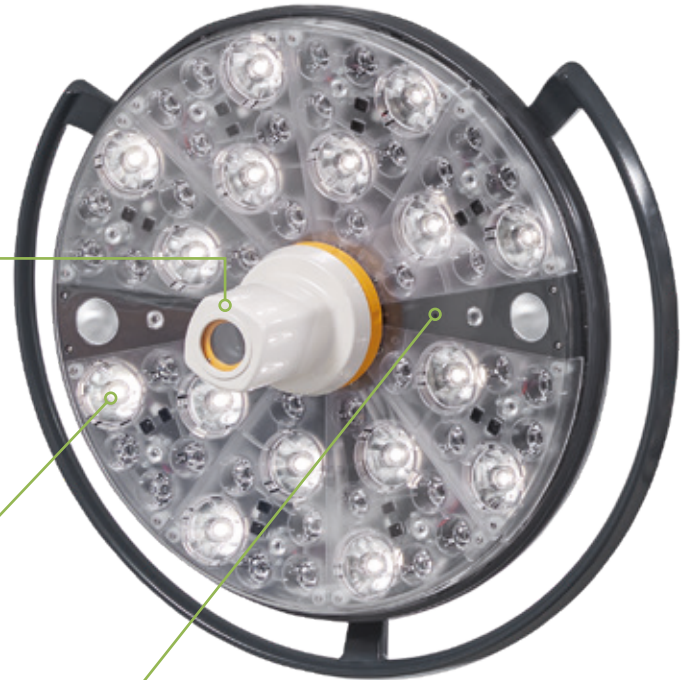
For more than a century, Getinge and its well-known brands – such as Maquet – have put patients first. It's why we remain committed to close relationships that identify real-world healthcare challenges, and address them with cost-effective, clinically relevant solutions.

As one of the world's largest medical technology companies, we have the resources to help you protect patients, proactively avoid complications, and prevent ergonomic issues that are common in medical settings. Our comprehensive portfolio of medical technologies will support you and your patients throughout the clinical pathway, so you can deliver the best possible patient care.



# Maquet PowerLED II

Evolving design,  
revolutionary features



### Full HD camera wired

Document procedures in full HD quality to share best practices among surgeons, maintain precise records for risk management, and optimize understanding and learning.

### Small light patch

With a minimum size of 13cm (5.1"), Maquet PowerLED II focuses illumination where it's most needed.

### Light patch positioning (laser)

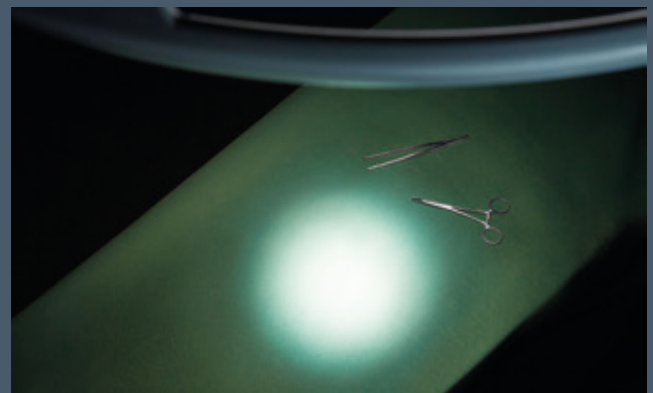
A laser guide ensures precise positioning for best lighting condition

Maquet PowerLED II 500



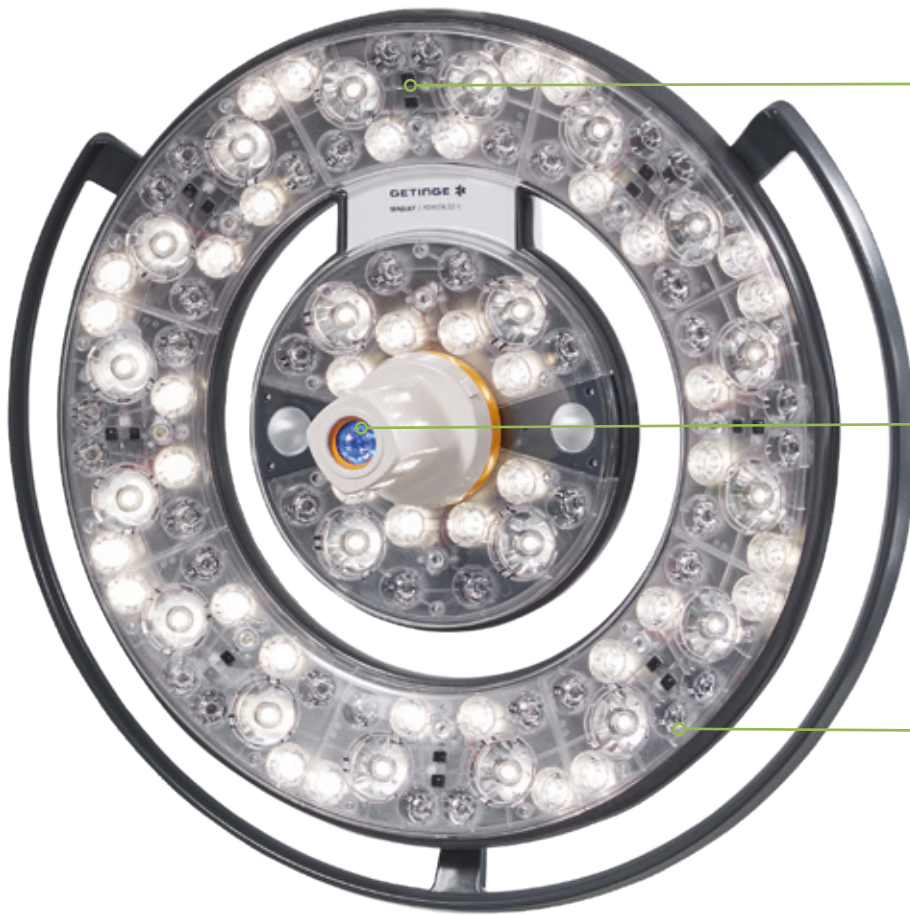
### Multiple colors of ambient light

Maquet PowerLED II ambient light gives surgical staff the flexibility to choose their preferred color (from white to yellow), limiting glare on the monitors and improving contrast. This improves clarity and helps set a friendly and peaceful mood for surgical staff.



### Adjustment of the light patch diameter

Match the light patch to the wound size, delivering light exactly where it's needed.



**Automatic Illumination Management (AIM)**

The AIM system automatically compensates for light blocked by the surgeon's head by boosting the remaining zones. This offers total freedom of movement without any reduction in illumination, improving workplace comfort.

**Luminance Management Device (LMD)\***

LMD automatically regulates the illumination reaching the surgeons eyes. The technology maximizes useful light and minimizes eye fatigue by adapting to shadows and avoiding excessive variations in luminosity.

**Comfort Light (optional)**

Comfort Light minimizes luminance contrasts between the center of the light patch and its periphery. This reduces the glare effect to protect against eye fatigue and to help improve patient outcomes.

Maquet PowerLED II 700

\* on option/availability: January 2019



**Quick Lock System**

Maximize the value of your investment. Easily transition cameras or LMD systems as you pool equipment between rooms – no special tools needed.



**Antibacterial coating minimizes germ spread**

Antibacterial film and paint on keypads and external handles limit the risk of cross-contamination.





### **Shadow management**

Everything has been designed to enable the medical team to focus exclusively on the surgical operation thanks to the perfect shadow dilution. A large number of individual divergent light beams create a complete light patch, ensuring that the light field will remain circular and shadow-free. Maquet PowerLED II provides the best illumination, even when surgeons are blocking the LEDs.

# Advanced surgical lighting

## to keep patients safer

Patient safety is the most important aspect of health-care. But in an environment where safety is often equated with new technologies and techniques, sometimes the simplest things can be overlooked.

We believe that positive outcomes rely heavily on surgeons' eyes: the ability to clearly see the problem, assess the situation, and safely treat the patient. In short, good lighting in the OR plays a major role in achieving positive patient outcomes.

### **Surgical safety – color remains stable over time**

Maquet PowerLED II uses only white LEDs to render natural and faithful colors. White LEDs prevent the distracting colored shadows that can appear on the surgical field with the use of colored LEDs<sup>1</sup>. A color rendering index of better than 96 facilitates clear interpretation and diagnosis. And with long-life LEDs, you can expect more than 60,000 hours of reliable service with no shifts of the optical parameters and no risk to patients.

### **Boost function – prevent surgical complications**

Maximum illumination up to 160,000 lux can be achieved by using boost mode during severe bleeding. This gives additional light when needed, but minimizes radiant heat during normal operation to prevent tissue drying – even in the most sensitive patients. You can operate in total confidence, with no additional uncontrolled risk.\*

### **Smart electronics – prevent downtime**

All LEDs are independently controlled by smart electronics, ensuring maximum illumination even in the event of an electronic failure.

### **Improving OR hygiene**

Hospital-acquired infections contribute to the high cost of healthcare, and delay patient recoveries. Getinge has taken steps to minimize the risk of complications from nosocomial infections throughout the OR by developing an antibacterial coating on high touch surfaces such as touchscreens, keypads and external handles. This coating helps to reduce the risk of cross-contamination and hospital-acquired infection to keep patients safe.

### **Open ring design – asepsis compatibility**

The open ring design\*\*, smooth surfaces and excellent heat dissipation aim to work with laminar air flows from all ceiling air flow systems.

<sup>1</sup> Knulst AJ, et al. Surgical Innovation, 2009

\* Total irradiance is strictly below 500 mw/m<sup>2</sup>

\*\* The open ring design is unique to the Maquet PowerLED II 700

# Stable and constant illumination

## Enhanced visibility, diagnosis and treatment

Maquet PowerLED II improves conditions before, during and after each procedure. Long hours in the surgical suite require constant concentration, steady hands, and stamina. But surgeons can't devote their full attention to the procedure if they are distracted by shadows or lighting repositioning. The workplace experience can be dramatically improved with best-in-class illumination.

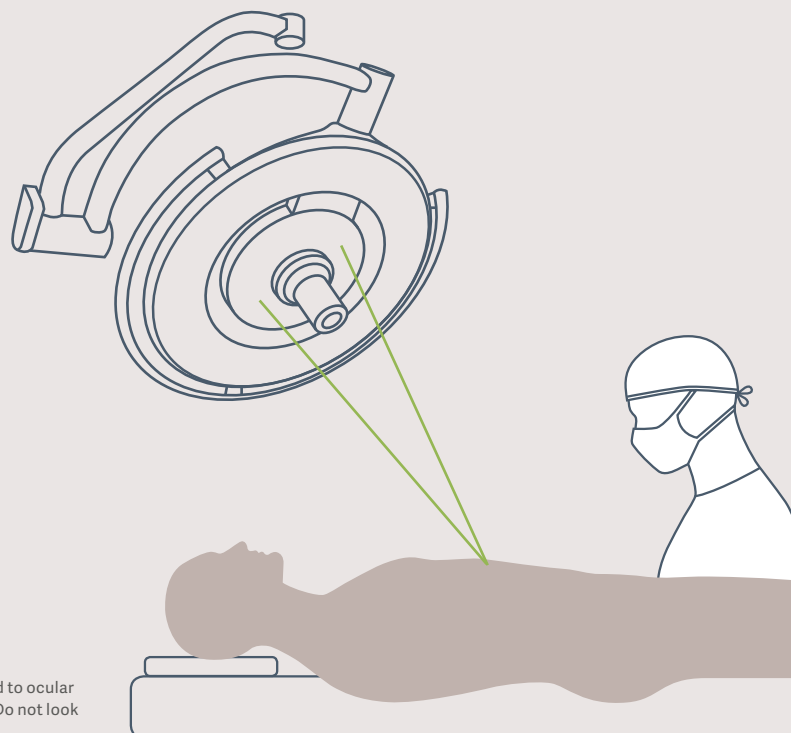
High-quality illumination helps to relieve strain, ensure confident assessment, and minimize distractions to return the surgeon's full attention to the patient. When lights are properly positioned, no time or attention is lost in adjustments. Maquet PowerLED II offers features to ideally position lighting which facilitates surgical procedures.

- **Adjust the light patch to the incision size:** the light patch is electronically adjustable from 13 to 27 / 5.11" to 10.6" to meet the incision size, preventing peripheral glare.
- **Laser positioning for optimal lighting parameters:** a laser guide is available to easily position the cupola at the right distance and place for optimum working conditions.
- **Consistent illumination from start to finish:** Flux Stability Program (FSP) applies an automatic compensation, cancelling out the drop in intensity that is inherent to LED technology.

### Precise positioning

Laser guide to easily position the light patch at the center of the surgical field

Class II laser: risk of injury. A long eyes exposure to laser can lead to ocular injuries. Do not point a laser beam in unprotected patient eyes. Do not look directly into the laser.

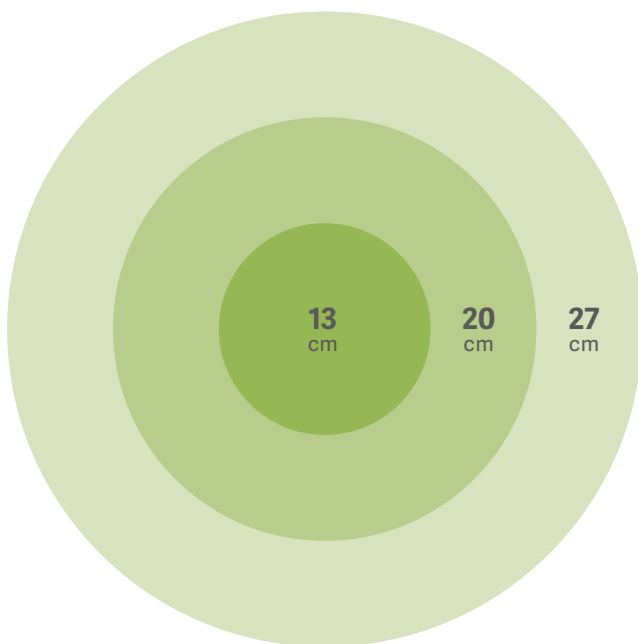




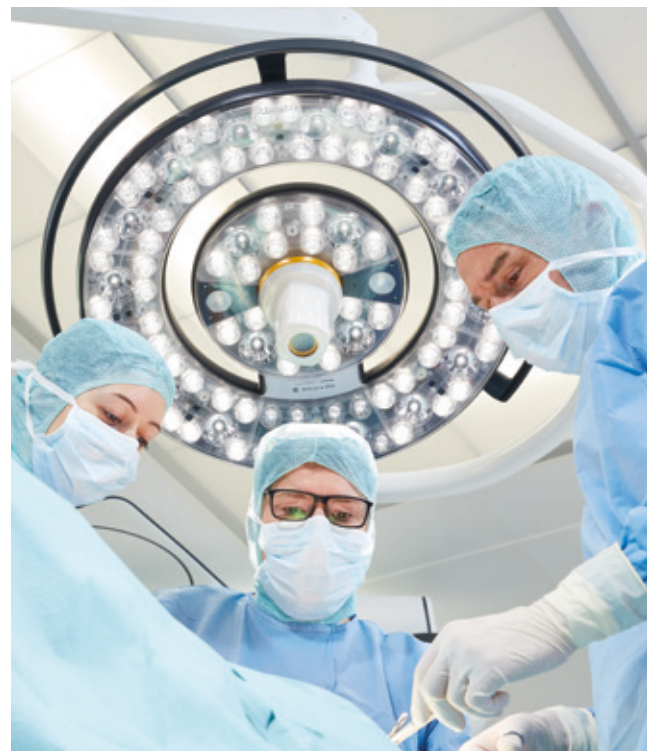
- **No illumination lost:** Automatic Illumination Management (AIM) automatically compensates for LED obstructions to deliver consistent and effective illumination, without readjustment. Indeed, with two surgeons behind the cupola, useful light remains at 100%.
- **Reduce glare effect:** The eye sensitive response (ESR) function, based on Fechner's law, provides an efficient linear light sensation by gradually adjusting brightness to improve perception.

- **Dimming for any type of application:** Customize illumination from 10 to 100% to reduce eye strain. This improves the surgeon's experience across all applications, from prostatectomy to breast reconstruction.
- **Maximize useful light:** Minimize eye fatigue caused by shadows with the Luminance Management Device (LMD).\*

\* Availability: January 2019



Precise positioning light patch adjustment from 13 up to 27 cm to focus illumination where it's most needed.



Automatic Illumination Management



## Improving workplace comfort

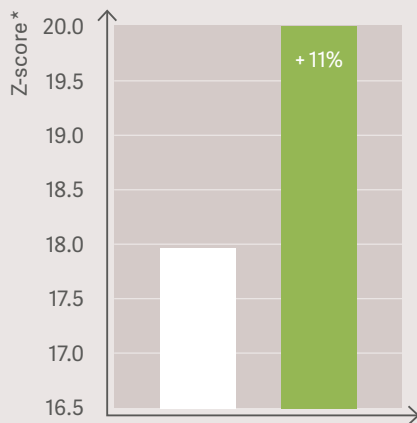
Visual fatigue affects work performance. Poor visual conditions can have dire consequences in the OR. However, reducing the contrast between the surgical site and surrounding areas improves comfort and visual performance. Thanks to the Comfort Light feature, Maquet PowerLED II improves visual performance,

reduces the sensation of glare and increases the feeling of wakefulness leading to a better working environment for the surgeons. The number of mistakes at the color vision test is reduced by 13%, the sensation of glare by 7% and sleepiness by 15% whereas the visual acuity is improved by 11%.

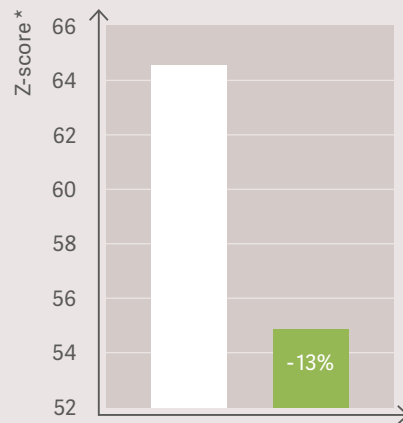


# Reducing visual fatigue to minimize errors with Comfort Light

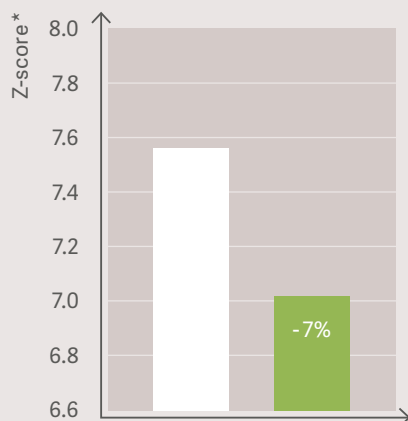
Visual acuity



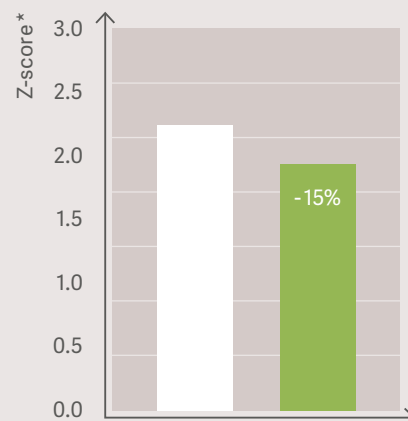
Number of mistakes  
at color vision test



Glare



Sleepiness



Surgical light alone  
 Surgical light with Comfort Light

\* A Z-score is frequently used in statistics and is a good way to eliminate inter-individual deviations, as it serves to consider a participant's result according to his/her average result over all of the scenarios tested. The formula is as follows:  
 $Z\text{-score} = (\text{value} - \text{average value}) / \text{standard deviation}$ .



## Full integration to the OR environment from conventional to hybrid rooms

**The antibacterial touchscreen wall keypad** allows the synchronization of the cupola to meet surgeon or specialty preferences, without the risk of cross-contamination. Preventive maintenance, including backup power supply testing, operating parameter storage, self-diagnostics, and remote control and communication can be provided. An RS-232 interface can be linked to various integrated products.

**Sharing information in full HD quality** such as best practices among surgeons or to document procedures for risk management.

**The quick lock system** allows accessories such as HD cameras to be quickly and easily connected and disconnected without special tools. This minimizes setup time between procedures, and allows easy pooling of accessories, with cameras shared throughout the surgical suite.

**The Maquet Satellite Anchoring System** allows equipment to be positioned within reach of the surgeon, concealing wires and cables to improve safety and hygiene. Equipment can be easily added, removed and upgraded to meet future requirements.





**Getinge Flat Screen Holders** accommodate larger and heavier flat screens – up to 32 inches, with full HD or 4K visualization, without disrupting your surgical light configuration.

**Maquet Moduevo:** Our easily positioned ceiling supply unit range keeps vital equipment near the patient, without cables and connections to get in the way.

### A dedicated Hybrid OR solution

With more than 1,000 completed Hybrid OR installations, we are experts in the field. We know that the Hybrid OR is the future of surgery. We developed the Maquet PowerLED II light to be future-proof, ready for the Hybrid OR when you are.

**Longer suspension arm:** Move the Maquet PowerLED II out of the way to make room for imaging equipment.

**X-ray shield:** Seamless integration with the latest Hybrid imaging technologies.

# Maquet PowerLED II

## Product range

### Multimedia equipment

Single/Double\* Getinge Flat Screen Holder



Maquet Orchide HD (only on external arm)



Wired camera\*\*



LMD\*\*\*



\* Available only via Satellite equipment  
 \*\* Full HD  
 \*\*\* Availability: January 2019

### Keypads

Touchscreen wall keypad



Capacitive wall keypad



Lighthouse keypad



### Suspension arms

Maquet SA Suspension



Maquet Satellite Anchoring System



Maquet SB Suspension



Maquet Rolite with Maquet PowerLED II 700



Maquet Rolite with Maquet PowerLED II 500





# Maquet PowerLED II

## Technical data

Optical characteristics	Maquet PowerLED II 700	Maquet PowerLED II 500
Nominal illuminance $E_c$ (lx)	140,000 <sup>1</sup>	
Nominal illuminance $E_c$ (lx) with boost mode (lx)	160,000 <sup>1</sup>	
Dimming range	10–100% with eye sensitivity response	
Light patch diameter (cm / inch)	13–20–27 / 5.1"–7.9"–10.6"	13–20 / 5.1"–7.9"
Depth of illumination at 60% (cm / inch)	24–43–44 / 9.4"–16.9"–17.3"	38–53 / 14.9"–20.8"
Color temperature (K)	3,800 or 4,300 <sup>2</sup>	
Color rendering index (Ra)	96	
Irradiance at nominal illuminance ( $W/m^2$ )	< 500 <sup>3</sup>	
LED life time (h)	> 60,000	
Ambient light	< 500 lx 6 different colors	

Shadow dilution <sup>4</sup>	Maquet PowerLED II 700	Maquet PowerLED II 500
Shadow dilution with one offset mask (%)	100	
Shadow dilution with two masks (%)	100	80
Standard features	AIM, FSP, integrated antibacterial coating, laser positioning	
Additional options	LMD, Comfort Light	

Full HD wired camera		
Number of pixels	2.12 Megapixels	
Optical zoom	x10 (x60 with digital zoom)	

All values are measured according to IEC 60601-2-41.

1 For all light field diameters

2 The color temperature is chosen at the order

3 In standard mode

4 With AIM mode



Getinge is a global provider of innovative solutions for operating rooms, intensive care units, sterilization departments and for life science companies and institutions. Based on our firsthand experience and close partnerships with clinical experts, healthcare professionals and medtech specialists, we are improving the everyday life for people – today and tomorrow.

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