

Operating Lights




marLED® with VariLUX


Outstanding LED light of the 2nd generation



reddot design award
winner 2008



The operation starts. The light is turned on. It is easy to set. Color temperature can be adjusted in accordance with specific requirements. Even the light field geometry can be adapted to the surgical field. And all of this without any color shadows cast in the surgical field because the light is mixed right at the light source. All this makes the operating lights from KLS Martin truly unique: marLED®, the light of the 2nd LED generation.



Outstanding
in Form and Function

With marLED®, KLS Martin treads new paths in surgical field illumination – now offering an innovative LED line in addition to the marLUX® halogen and gas discharge series of operating lights. New paths? Yes. Although it is true that LED-based operating lights have been around for some time, marLED® is new because it exclusively uses LED chips of the second generation: smaller and more compact, with superior light yield yet lower power consumption.

marLED®'s advantages, however, are by no means limited to design and lighting technology. In fact, this novel operating light is based on a radically new optical and housing concept. Its trail-blazing design harmoniously combines ergonomics and technology, bringing an optimal working atmosphere to any state-of-the-art operating room. And despite being a newcomer to the market, marLED® has already won internationally renowned design awards on the merits of its outstanding form.



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Unique

in Light Mix and Light Field Adaptation

Two features in particular distinguish marLED® from conventional LED operating lights: on the one hand, the light is mixed right inside the LED “light engines” – which effectively prevents the casting of color shadows. On the other hand, there is VariLUX, the currently unique function that enables light field adjustment to the surgical field, giving you the choice between circular and oval illumination. Thus, with marLED® you can adjust the light field geometry in accordance with anatomical requirements or the operating technique used.



Small LEDs – Great Effect

What makes marLED® so unique is its compact design with the significantly smaller high-performance LEDs of the second generation. Now the light is mixed right inside the “engines” – and not, as before, when it reaches the surgical site. Cast color shadows are therefore a thing of the past and the same applies to contour shadows, due to the complete absence of different colors in the surgical field. But there’s even more to marLED®: the new LED generation also improves the light yield and cuts heat generation even further, with color temperature being adjustable from day-light quality to warm-white artificial light. In a nutshell, marLED® always provides ideal light for cool heads.

3800 K



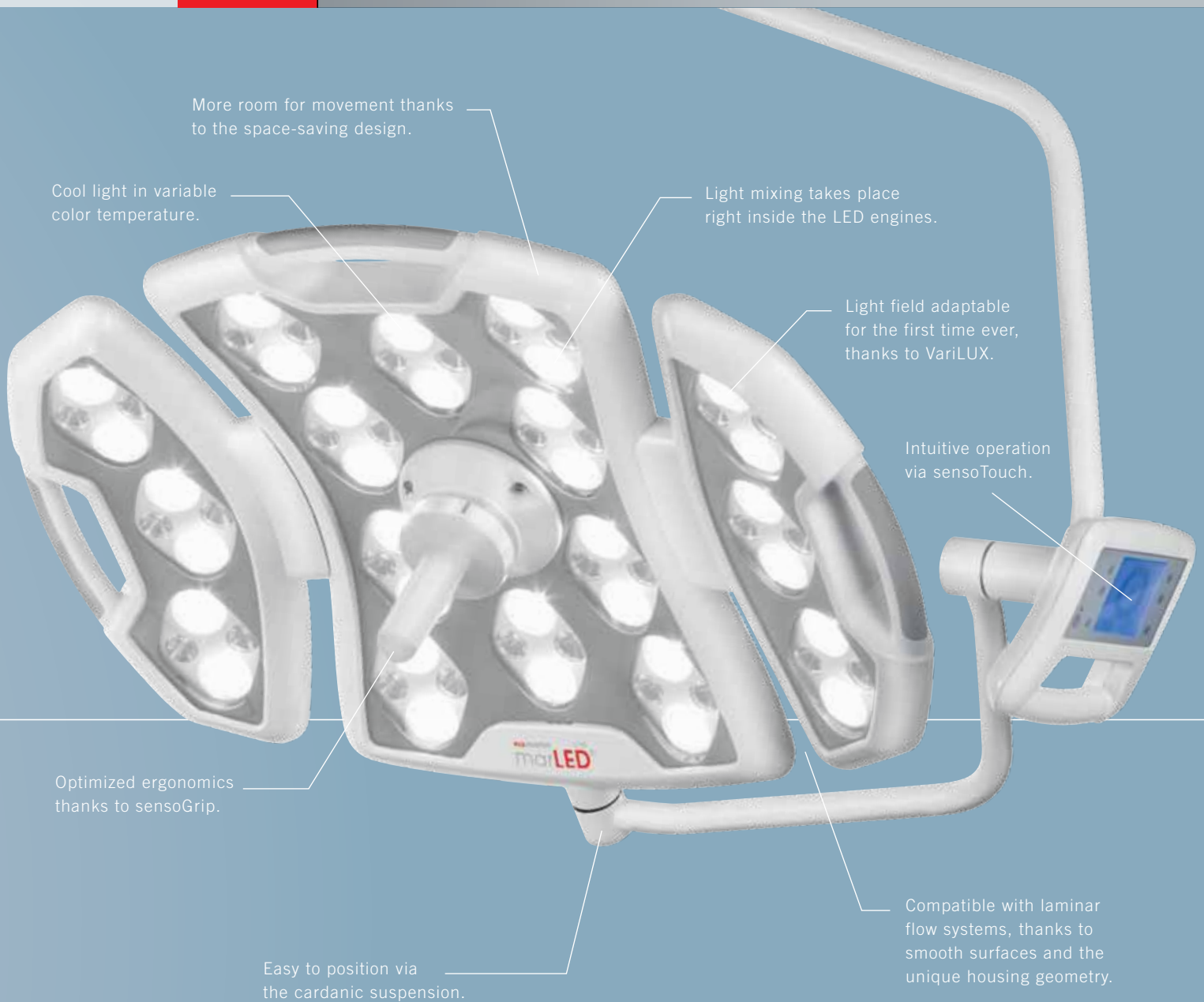
4300 K



4800 K



Variable color temperature: Depending on specific requirements, the surgical site can be illuminated with light in quasi-daylight quality or with a lower color temperature.



More room for movement thanks to the space-saving design.

Cool light in variable color temperature.

Light mixing takes place right inside the LED engines.

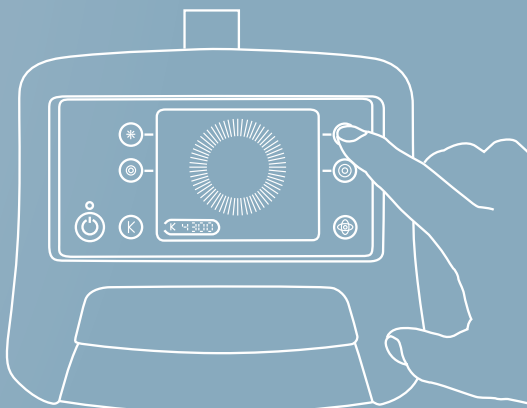
Light field adaptable for the first time ever, thanks to VariLUX.

Intuitive operation via sensoTouch.

Optimized ergonomics thanks to sensoGrip.

Easy to position via the cardanic suspension.

Compatible with laminar flow systems, thanks to smooth surfaces and the unique housing geometry.



Improved Ergonomics – Easier to Operate

Smaller LEDs, lighter construction – marLED® weighs considerably less than conventional operating lights. This optimizes ergonomics. As a result, the main light and the satellite light can be easily positioned with the sensoGrip handle and directly operated via the sensoTouch panel. The easy touch screen control of all functions is fitted to the cardan joint and can be handled intuitively by any user.

Perfect *for Integrated Systems*

marLED® leaves room for all options. The lighting system consists of the marLED® V16 main light and the marLED® V10 satellite light. Moreover, these LED lights are dimmable to such an extent that, in the light output range of two percent, marLED® can be excellently used for background illumination. The operating light can also be used with the surgiCam® camera system, e.g. for transmission of surgical procedures in HD quality to TFT flat screens and big screens/vidiwalls (lecture halls).

What's more: marLUX® users wishing to convert or supplement their lighting systems can do so easily because marLED® is fully compatible with the modular design of marLUX®.



Space-saving design

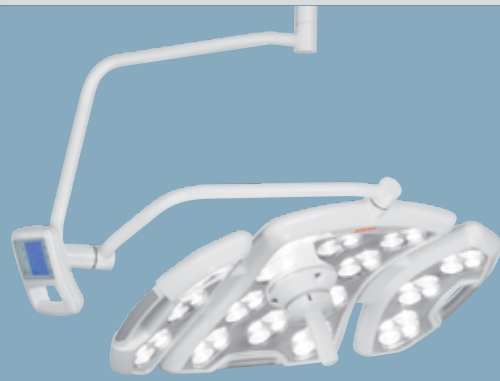
The main and satellite lights are a perfect match in terms of form. This makes it possible, for the first time ever, to position all lights side by side in a way that utilizes the available space optimally. This, in turn, creates room for movement – free space that can be used for other equipment such as a suspension arm for integration of a surgiCam® camera system.

Laminar flow compatibility

Thanks to the elegantly segmented housing with its positively aerodynamic lines, smooth finish and small air flow contact surfaces, marLED® can be perfectly integrated into laminar flow systems. As a result of their ideal properties, KLS Martin operating lights impress with their first-rate performance under air supply ceilings with low-turbulence displacement flow.

In the focus of surgiCam®

marLED® can be easily used in conjunction with surgiCam® if you wish to document surgical procedures for training purposes, make use of live transmissions or consult with external surgeons during operations. The camera system is available in different versions and can be operated with integrated OR systems. Digital image data is recorded in server-based databases. surgiCam® delivers first-rate images in SD or HD quality straight to your TFT monitor. In its advanced version, all the camera functions can be remote-controlled from PC workstations outside the operating room via password-protected access control.



marLED® V16



marLED® V10

Technical Data

Max. illuminance	160,000 lx	120,000 lx
Light field diameter	25 – 35 cm (options: circular or oval)	23 – 33 cm (options: circular or oval)
Color temperature	3800 – 4800 K, variable	3800 – 4800 K, variable
Color rendering index (CRI)	95	95
Luminous efficacy	289 lm/W	289 lm/W
Illumination depth L1 + L2	129 cm	129 cm
Dimming range	30 – 100% (2%: backLite operation)	30 – 100% (2%: backLite operation)
Light sources	High-performance LEDs, arranged into 16 “light engines”	High-performance LEDs, arranged into 10 “light engines”
Expected LED service life	40,000 h	40,000 h
Operation	Sterile via sensoGrip Non-sterile via sensoTouch panel backLite background illumination for endoscopy	Sterile via sensoGrip Non-sterile via sensoTouch panel backLite background illumination for endoscopy
Light head suspension	fully cardanic	fully cardanic
Light head dimensions	approx. 87 x 64 cm	approx. 64 x 46 cm
Optional accessories	surgiCam® SD and HD camera systems Interface for integrated OR systems LC suspension system for low rooms Wall operation Pilot laser	surgiCam® SD and HD camera systems Interface for integrated OR systems LC suspension system for low rooms Pilot laser
Extension options	TFT arms, camera arm, arm system with device platform, ceiling pendant system for surgery	TFT arms, camera arm, arm system with device platform, ceiling pendant system for surgery

All lighting values are subject to a tolerance of $\pm 5\%$ due to manufacturing and metrological reasons.

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