

## Operating Light marLED® V16 / V16 D



### Mechanical Design

Operating light system for ceiling installation, consisting of ceiling tube, horizontal cantilevers, spring arms, cardan joint and light bodies. Depending on the situation at the installation site, ceiling installation is done using a ceiling anchor plate or a suspended ceiling construction. The support arm system ensures unrestrained mobility and wide action radius and allows for a variety of height adjustments. Use of lightweight materials such as aluminum minimizes the total weight and torque, improving operating comfort. The light body comprises several handles for safe positioning and the sensoTouch operating panel for non-sterile operation of all lamp functions. The hygiene guidelines for fast and safe disinfection of the light body are met by a sealed housing with smooth surfaces and special design elements. Design and construction principle of the light body optimized for laminar flow improve operation under laminar-flow ceilings.

Subject to technical changes

## Light System

High-performance LEDs of several color types are used to illuminate the operating field. The arrangement of the light engines in the light body creates both shadow-free illumination and deep-cavity illumination. Computer-calculated optical lens systems allow uniform illumination without any color shadows for smaller or larger surgical sites. LED light consists only of visible light, without any infrared radiation. The unique VariLux function has a variable field geometry, allowing both circular and elliptical illumination areas, depending on the demands of the operating field. The color temperature can be preselected individually. The large number of 256 single LED in each light body assures almost 100% reliability and at the same time a long service life of the light sources.

## Operation

All operating functions can be controlled via an easy-to-understand touch panel located at the cardanic suspension. The surgeon can adjust relevant parameters on the central multi-purpose sensoGrip handle. Light intensity and field diameter are adjusted fully electronically and without mechanical components. The current setting is visualized graphically on the touch panel with the novel, dynamic Ergo screen display. The precise positioning of the light body is ensured by integrated handle elements that are accessible from all sides in all operation situations. Instead of using the operating panel, the light field can also be adjusted using the sterile multi-purpose handle sensoGrip in the center.

## Additional Equipment Options

Touch-sensitive KLS Martin pilot laser system for safe positioning of the light field center.  
KLS Martin camera system SurgiCam – for supreme image quality and resolution as well as optional network compatibility for digital data transfer of video, audio and control signals. The system can be integrated either directly into the light center or via an optional video support arm.

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Electrical Data		marLED® V16	marLED® V16 D
Power module incl. mounting plate Dimensions [L x W x H]	mm	260 x 205 x 125	260 x 205 x 125
Power module, primary voltage	V	85 / 240 (AC)	85 / 240 (AC)
Fuses on the 24 V side	A	10	10
Fuses on the 230 V side	A	10	10
Power input at 100-240 VAC	VA	175	175
Power input at 24 VDC	W	135	135
Voltage on wall or ceiling mounting location	V	28 – 36 (DC)	28 – 36 (DC)
Effective lifetime of light sources	h	40,000	40,000
Voltage stabilization (electronically)		Yes	Yes
Soft-start option (light does not start with immediate full brightness)		Yes	Yes
Focusing / light-field memory		Yes	Yes
Automatic switchover to backup light source		Yes	Yes
Electronics comply with the regulations of VDE and IEC		Yes	Yes
Classification acc. to German Medical Devices Act		I	I
Protection class acc. to IEC 601		I	I
Degree of protection support arm system		IP 30	IP 30
Degree of protection light body		IP 42	IP 42
Conformity		CE	CE
Battery recharge time	h	No battery operation	No battery operation
Operating time with battery	h	No battery operation	No battery operation
Battery capacity	Ah	No battery operation	No battery operation

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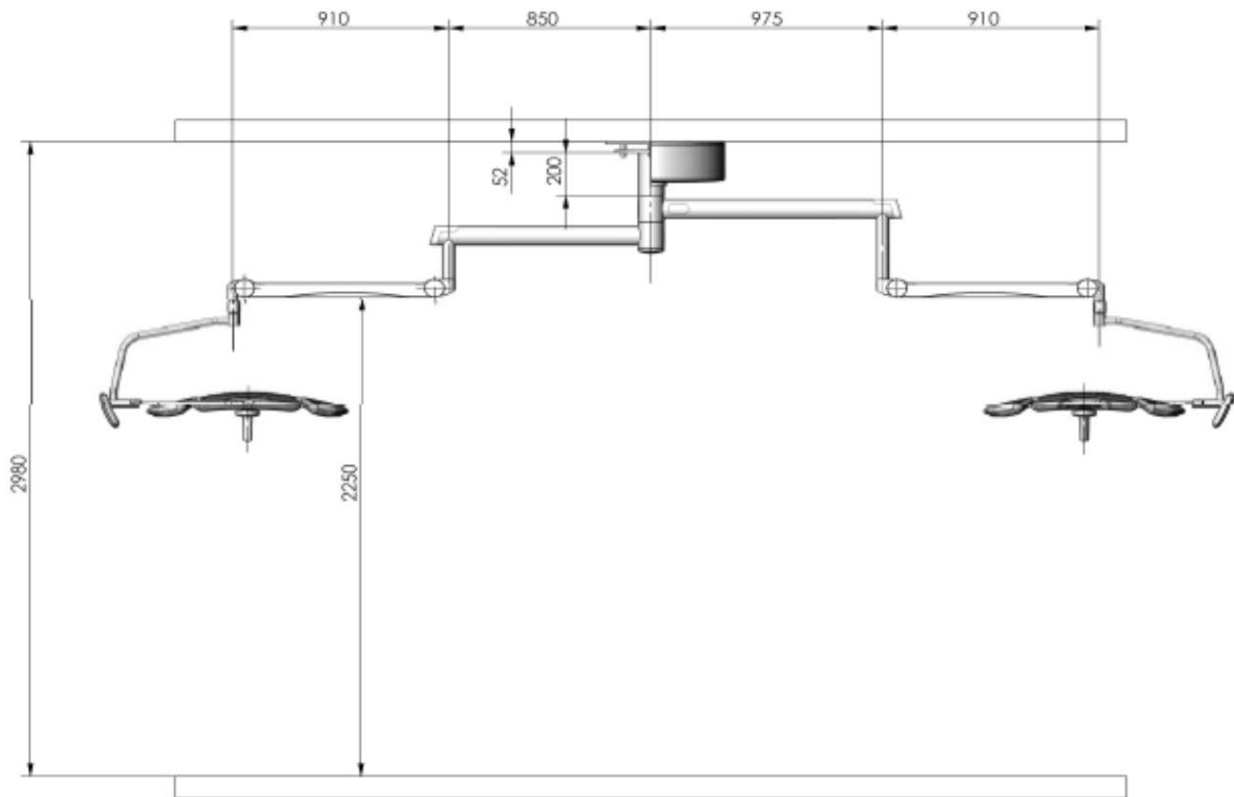
Light technical data		marLED® V16	marLED® V16 D
Central illuminance electronically dimmable from / to	%	30 – 100% / 2% (in Endo mode)	30 – 100% / 2% (in Endo mode)
Central illuminance at a distance of 1 m	lx	160,000	160,000
Light field diameter (d10, distance 1 m)	mm	250 – 350	250 – 350
Light field diameter (d50, distance 1 m)	mm	130	130
Color temperature:	K	3,800 – 4,300 – 4,800	3,800 – 4,300 – 4,800
Color rendering index [Ra (1 – 8)]		95	95
Red rendering index [R9]		> 85	> 85
Total irradiance (at 100,000 lx)	W/m <sup>2</sup>	364	364
Total irradiance (at 130,000 lx)	W/m <sup>2</sup>	449	449
Photometric radiation equivalent (efficacy)	lm/W	289	289
Illumination depth (without refocusing) L1 / L2 (20% of Ec max, see E9 / E15)	mm	490 / 800	490 / 800
Illumination depth (without refocusing) L1 / L2 (60% of Ec max, see E9 / E15)	mm	320 / 320	320 / 320
Working area from – to (20% of Ec max, without refocusing)	mm	510 – 1,800	510 – 1,800
Working area from – to (60% of Ec max, without refocusing)	mm	680 – 1,320	680 – 1,320
Shadow dilution with one mask	%	63	63
Shadow dilution with two masks	%	51	51
Shadow dilution with one tube	%	81	81
Shadow dilution with one tube and one mask	%	45	45
Shadow dilution with one tube and two masks	%	37	37
Laminar Flow Index acc. to Leeneman		19.2	19.2
Laminar Flow Index acc. to Oostlander		25.0	25.0
UV irradiance for wavelengths < 400 nm	W/m <sup>2</sup>	< 10	< 10

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Mechanical Data		marLED® V16	marLED® V16 D
Minimum room height (power module on ceiling flange / passage height 2.25 m)	mm	2,980	
Minimum room height (power module separate / passage height 2.25 m)	mm	2,840	
Operating forces on light body	N	acc. to standard	acc. to standard
Action radius	mm	1,760	1,760
Spring arm height adjustment (acc. to ceiling height)	mm	1,178	1,178
Light body height adjustment at 2.25 m passage height	mm	2,322	2,322
Dimensions, diameter of the ceiling anchor plate	mm	380 × 380	
Bottom position of light body at 2.25 m passage height	mm	1,144	1,144
Force required for moving light body up / down	N	14	14
Force required for swiveling the light body	N	6	6
max. horizontal weight force	N	approx. 800	
Total weight	kg	80	
approx. individual weight (standard ceiling tube)	kg	8	
approx. individual weight (tracking arm, spring arm)	kg	14	14
approx. individual weight (power module)	kg	7	7
approx. individual weight (light body)	kg	16	16
Torque, bending moment	Nm	approx. 750	
Permissible ambient temperature range during operation	°C	+5 °C to +40 °C (41 °F to +104 °F)	+5 °C to +40 °C (41 °F to +104 °F)
Storage temperature	°C	-10 °C to +50 °C (14 °F to +122 °F)	-10 °C to +50 °C (14 °F to +122 °F)
Shock / impact resistance		8 g / 10 ms	8 g / 10 ms
Vibration resistance		10 – 150 Hz / 0.15 mm / 2 g	
Canopy dimensions	mm	620 × 208 (100)	
Number of casters	pcs	none	none
Number of lockable casters	pcs	none	none
Number of lockable casters	mm	n. a.	n. a.
Air flow contact area of light body	cm <sup>2</sup>	4,105	2,535
Light body height (without sterile handle)	mm	53	53
Light body dimensions	mm	845 × 640	845 × 640

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Technical drawing:



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