

The NEW generation of operating  
and examination lamps

**PLUS LED**



**+ KLAROMED**

*Polish Manufacturer  
of LED's operating lamps*

The latest polish LED's operating lamps

## Features of plusLED lamps

To meet the needs posed by twenty-first-century surgery and each of its specialties, we created an innovative solution which are plusLED lamps.

Lamps provide a precise light wherever it is needed. The homogeneous nature of the light increases the surgeon's working comfort in every corner of a large operating area.

PlusLED lamps are characterized by extremely low heat emission in direction of the operating field.

The primary task of plusLED operating lamps is an accurate representation of the color spectrum of the operative field - in particular red color.

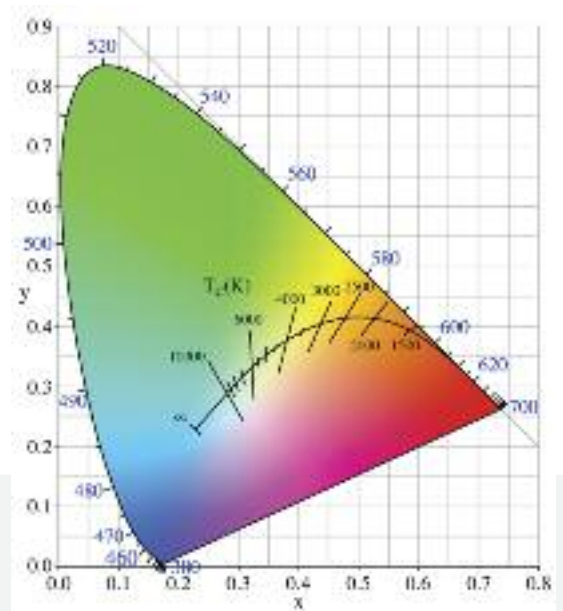
With colour rendering index Ra equal 96, operating and examinations plusLED lamps perfectly render color spectrum. The tiniest nuances of colour in tissue are clearly recognized with red rendering index R9 equal 96.

Red rendering index  $R9 \geq 90$  facilitates a visibly better recognition of details by surgeons.

The color's spectrum of the operative field is rendered naturally. Delicate and precise light of the plusLED lamp is friendly and provides welcome relief for surgeon eyes.

White LEDs, used in the construction are the fifth-generation LEDs of impressive lifetime of over 50 000 hours.

PlusLED lamps are the best lamps on the market, made in LED technology.

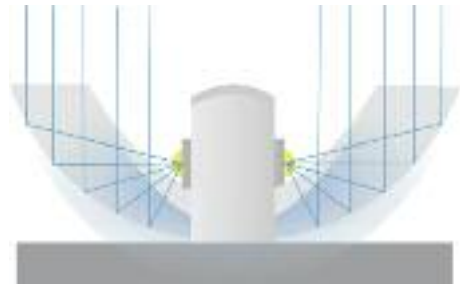


The way of arrangement and placement of the multi faceted reflectors in the matrix on the lamp head, emitting homogeneous light beams, eliminates shadows in the operating field.

Mentioned solution ensures homogeneous operating field of warm, white light with color temperature 4 900 K.

In order to maintain the highest standards, plusLED operating lights, may have a different color temperature.

Selected, other color temperatures are available optionally, determined in close cooperation with the end user, taking into account its preferences.



The main advantage of operating lamps pluLED is a double function, central sterile handle that allows the surgeon to regulate not only the diameter of the illuminated field but also light intensity, simultaneously.



This is a novelty in the field of ergonomics of surgeon's workplace while maintaining its sterile service area.

## Features of plusLED lamps

In order to improve comfort, plusLED lamp heads are equipped with a dual control system.

The first one is located in a sterile holder. The second control system is positioned on the glass panel made of ESG safety glass, in a side area on the edge of the luminaire.

The ideal complement to the central handle are sterilisable handle overlays with the possibility of steam sterilization at temperature up to 134°C.

Overlays are equipped with a stopper to securely fix it in place & enables rapid replacement.

Overlays were modeled ergonomically so handle is going well in a hand. This facilitates handling of a lamp head by a surgeon.

Used in the construction of the lamp, safety glass ESG is resistant to breakage and scratches.



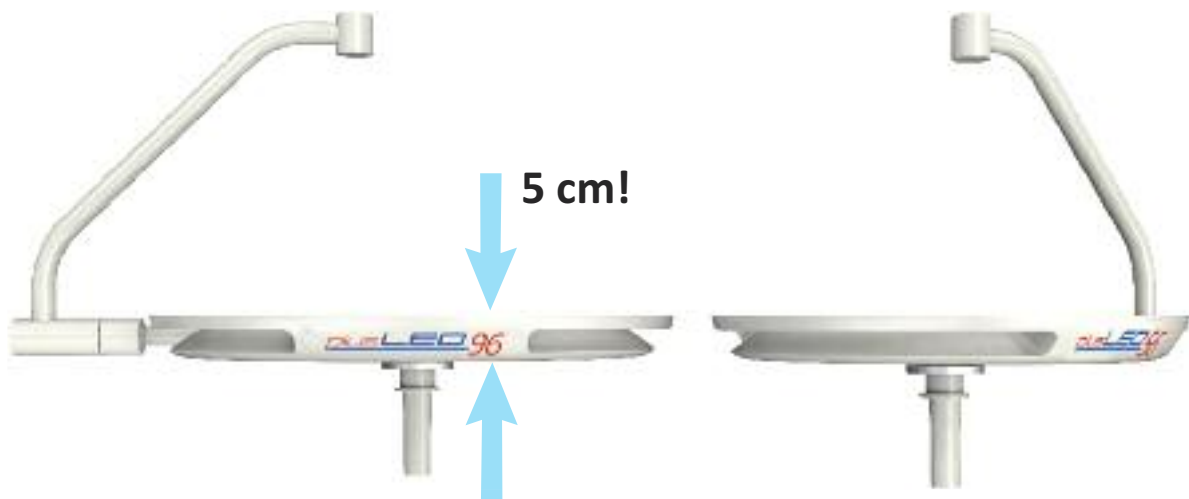
Compact lamp design increases the efficiency and ergonomics, allows to use lamps in a wide range of surgical specialties - at the same time helps to keep the lights perfectly clean.



Lamp housing is made of a light aluminum alloys, which guarantees shock resistance and long life.

The heat is emitted through the upper part of the housing into the ceiling direction, so very small amount of heat is emitted into direction of the surgeon's head and his shoulders.

The light head has a globally unique, ultra-thin and compact design.



The streamlined shape of plusLED lamps is ideal for operating rooms Class 1A, equipped with laminar flow.

The air flows around the profiled lamp housing without causing turbulence, ensuring good cooperation with a laminar flow.



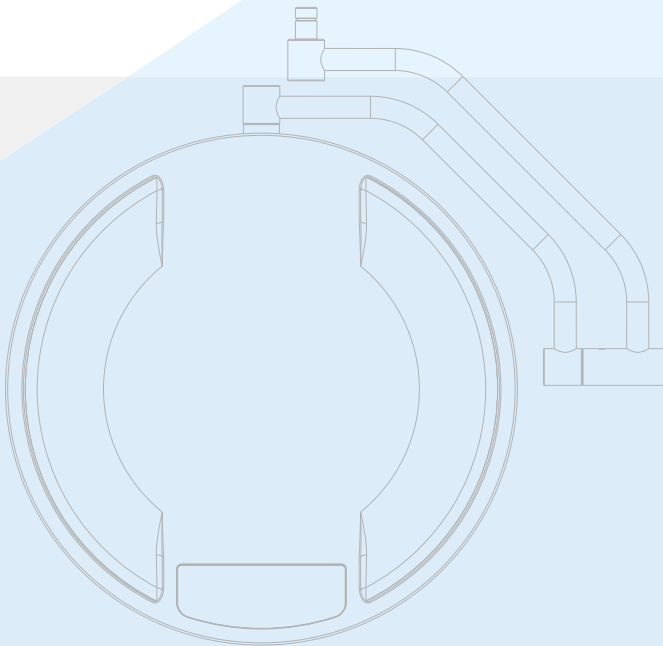
# plusLED 96

The plusLED 96 operating lamp uses a new fifth-generation LED technology for obtaining the enormous size of the surgical field with a diameter of 30 cm while maintaining maximum light intensity and minimal increase of temperature.

Many multi-faceted reflectors emit a perfect white light via 96 LEDs, giving a high shadowless effect and possibility of illumination of deep operational fields.

Multi-reflector structure enhances this effect by maintaining constant illuminance, irrespective of the size of the operating field.

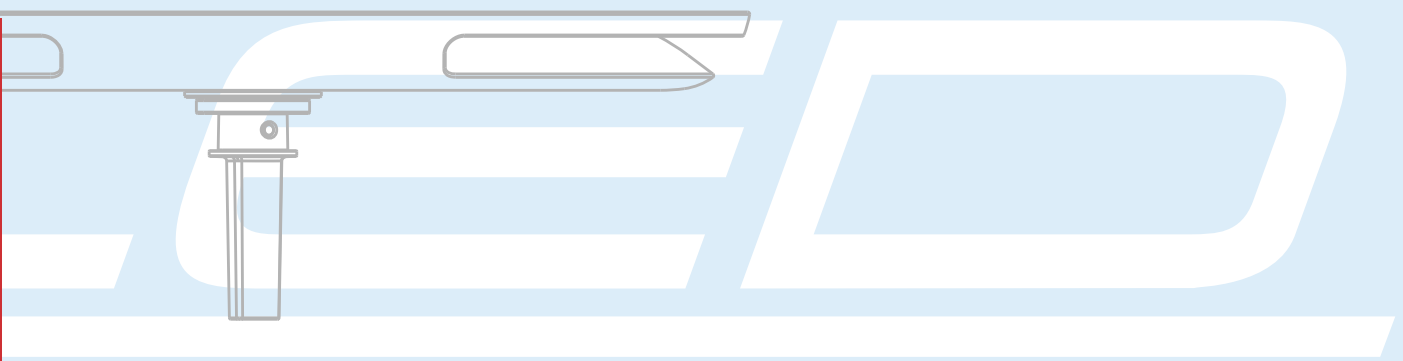
The lamp, equipped with an innovative sterile handle gives the surgeon complete control over the light parameters of a lamp. Without touching anything but precise sterile handle, surgeon can change the diameter of the operating field and illuminance.



Non-sterile handles, surrounding the lamp housing form a monolithic structure with the lamp head, ensuring a perfect cleanliness. Smooth transitions and slender form of the luminaire further enhance comfort.

Easy maneuverability, easy handling of lamps and a variety of options such as AMBIENT lighting or innovative two-camera TV system, the ability to setup any combination with flat monitors and accessories, allows to create a optimized product for twenty-first-century operating teams.





# plusLED 56

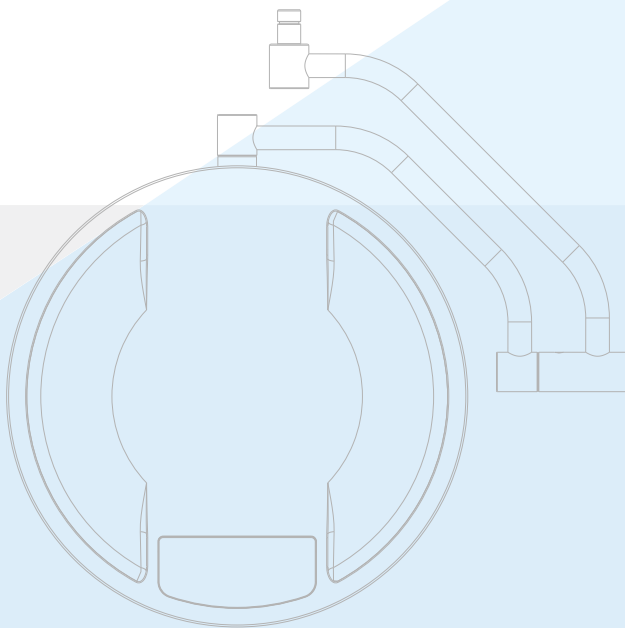
Thoughtful application of 56, high-performance fifth-generation white LED's was used for optimal illumination of different types of tissue.

Each lighting element, through the use of multi-faceted reflector generate a homogeneous beam which is applied to other beams, generated by the adjacent elements to form a homogeneous light field associated with a variety of surgical procedures.

A sophisticated compact design of the luminaire provides excellent light distribution & modern, very functional, aesthetic appearance.

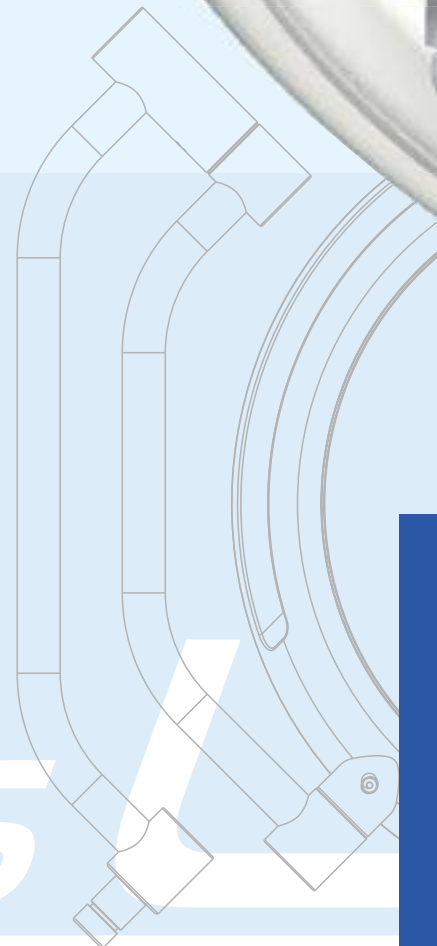
Used in the lamp construction, innovative sterile handle, allows the surgeon to control the parameters of light, precisely. Adjusting the light intensity and the diameter of the surgical field are done from the one sterile place.

The non-sterile handle forming a monolithic structure with the lamp housing is easy to keep clean, increasing the hygienic aspects.



Cool light with low proportion of infrared, eliminates the heating problem occurring over the surgeon's head area, providing a stable work environment, unchangeable during long surgical procedures.

Reduced heating effect by the lamp housing has positive impact on cooperation with laminar vent.



# PLUS





## PlusLED lamps with the two-camera video system

The two-camera plusLED 96 / 96  
operating lamp with INTEGRATOR system  
REF: K00150



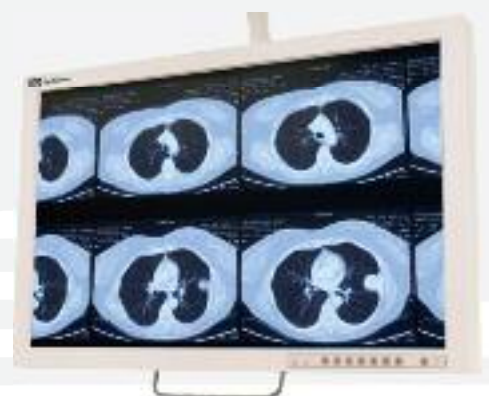
The world's first operating lamp with a two-camera system

PlusLED operating lamps is the world's first lamp with a two-camera system. The lamp is equipped with two, HD quality TV cameras and INTERGATOR system - capable of running dual-channel video recording feature images from the installed cameras. In addition to recording system, installed INTEGRATOR offers video transmission and connection to the local RIS radiology system.

Touching only a one button on the 24" control screen unit, allows you to record video. The recorded material can be completed to the standalone CD/DVD media disc to reproduce on other workstations.

The electronic negatoscope uses an additional monitor with DICOM curve, together with the control unit suspended on a dedicated third arm of the lamp. Negatoscope allows you to select patient records by patient's ID number, name or date of the examination from the local RIS (eg. CT, MRI, ultrasound).

Video transmission applied in our lamps breaks down barriers of distance, providing access to specialists from other places or countries in order to facilitate consultation.



The two-camera plusLED 96 / 96  
operating lamp with DICO® system  
REF: K00160



**The world's first operating lamp with a two-camera system**

PlusLED operating lamp was equipped with two HD quality TV cameras & installed DICO® system, capable of running two-channel video recording from installed cameras and a video transmission.

Video recording is done with a single touch of a button on the negatoscope screen station, suspended on the wall of the operating room. The recorded material can be completed to the standalone CD/DVD media disc to reproduce on other workstations.

Video transmission applied in our lamps breaks down barriers of distance, providing access to specialists from other places or countries in order to facilitate consultation.

It's the perfect solution, which supports and facilitates all kind of trainings and education activities. It gives invaluable opportunities by establishing cooperation between many centers having consultative capacities.



## PlusLED lamps with the camera video system

plusLED 96 / 56 operating lamp  
with HDTV video transmission system  
REF: K00124



PlusLED operating lamp has an innovative functionality. Its central axis is equipped with a HDTV camera, giving invaluable opportunities of streaming video used to surveillance and visual communication within the operating room. Video receiver is a wireless handheld tablet, cooperating with the camera by which the image taken from camera is displayed.

System software installed on the tablet allows the user to adjust the operating characteristics of the lamp. Using the touch screen tablet, you can change the basic parameters of light such as brightness and diameter of the surgical field. Ergonomic, clear and intuitive interface based on clear and legible symbols additionally increases its functional solutions.

PlusLED operating lamps with such solution implemented, provides flexibility and meets the individual needs of different operational teams.

The investment in this type of system is very beneficial because it helps to increase efficiency and to improve comfort.





plusLED 96 / 96  
operating lamp  
REF: K00120



plusLED 96 / 56  
operating lamp  
REF: K00121

The power supply system of the lamp adjusts to the existing power conditions at the installation site. Lamps cwork with reserve power supply systems available in healthcare facilities.

## Sets of examination lamps plusLED

The construction of the examination lamps, based on double-secured and checked at the production stage components, directly translates into failure-free work of individual lamps and sets.

Electromagnetically compatible electrical and electronic circuits in plusLED lamps perfectly cooperate with emergency or reserve power supply systems available in healthcare facilities.



plusLED 56 / 56  
operating lamp  
REF: K00122



plusLED 56  
examination lamp  
REF: K00110

plusLED 96  
examination lamp  
REF: K00100

These combinations of operating lamps find their application in all medicine disciplines to illuminate the surgical field.

Single treatment lamps: plusLED 96 & plusLED 56 are available in wall mounted version.

The design of the lamp circuitry allows to adjust the existing supply conditions at the installation site. Lamps cooperate with reserve power supply systems available in healthcare facilities.

Set of arms used for wall mounts ensures precise maneuvering lamp in a wide range.



A wide range of solutions plusLED lamps complement examination, mobile lamps. These models are equipped with batteries, are ideally suited in case of power failure, ensuring a long period of working time.



## Technical parameters of plusLED lamps

General Data	Parameter	<i>plusLED96</i>	<i>plusLED56</i>
	Number of LED's	96	56
	Life-span of the LED's	>50 000 h	>50 000 h
	Diameter of the lamp head	694 mm	582 mm
Photometric values	Light intensity at 1 m distance (Lx)	160 000 lx	130 000 lx
	Electronic brightness adjustment	40 do 160 klx	40 do 130 klx
	Focussable size of the light field	170 do 300 mm	170 do 280 mm
	Colour rendering index Ra (CRI)	96	96
	Red rendering index R9	96	96
	Illumination depth (L1 + L2) 20%	900 mm	1 000 mm
	Illumination depth (L1 + L2) 60%	510 mm	550 mm
	Colour temperature (Kelvin)	4 900 K	4 900 K
	Endo-Light AMBIENT	5%	5%
Other parameters	Height adjustment	1 170 mm	1 170 mm
	Temperature increase in surgeon head area	< 0,5 °C	< 0,5 °C
	Power supply*	~230V, 50 Hz	~230V, 50 Hz
	Nominal voltage	24 V	24 V
	Voltage range	22 do 32 V	22 do 32 V
	Maximum current consumption	2,5 A	2,0 A
	Rated power output	50 W (50 VA)	40 W (40 VA)
	IP protection class	42	42

\* versions with different type of power supply available on request.

All values in accordance with EN 60601-2-41.

All light specifications  $\pm$  10%.

**EN ISO 9001 · EN ISO 13485**

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