



**Dr. Mach**  
Medical lighting  
+Technology

## Dental Solutions

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Light systems for dental medicine and oral surgery

Mach LED 2sc Hybrid  
Mach LED 3sc with video system  
Mach LED 130 Dental  
Mach LED 150

OPERATING AND EXAMINATION LIGHTS



# Focus on the light!

Dr. Mach sets standards in the medical illumination technology since decades.

Dr. Mach operating and examination lights support your professionalism by innovative technology and design. Natural colour reproduction and exact illumination of the oral cavity with the newest LED-Technology make your work easier and convey safety and trust to your patient.

Your **Dr. Mach** Team

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# Operating lights for dentistry with Dr. Mach LED technology

## SC models

are equipped with **Single-Colour-chips**. Changing the colour temperature is not possible in this case. Of course all the other advantages of the LED technology are also implemented here.

## Lighting technology – special features of the Mach LED 2sc Hybrid

The OT-light Mach LED 2sc Hybrid offers two different operating modes for the doctor:

### 1. OT-mode

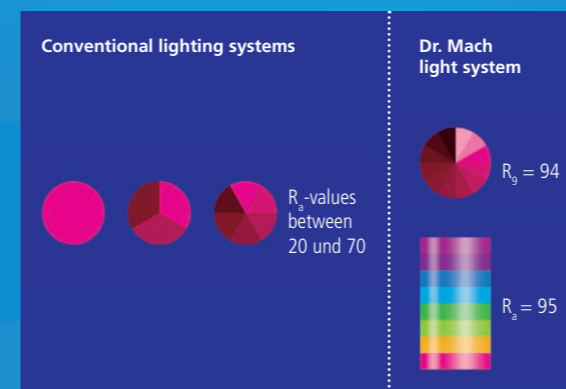
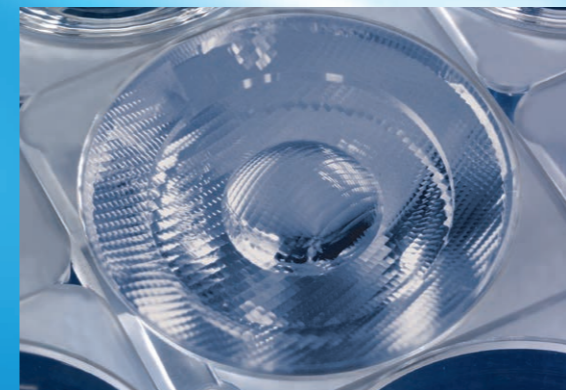
The light can be used as a normal OT-light for the oral and maxillofacial surgery. All functions of the light are available: changing of the light field size, depth light, light intensity control.

### 2. Dental-mode

The light can be used as a treatment light for dentistry. The photometric properties of the dental-mode are orientated to the standard DIN EN ISO 9680 (Dentistry-Operating lights).

The dental mode is activated by pressing the „DENTAL“ button on the key pad of the light. The outer LED units turn off and the illuminated central LED unit creates an oval-shaped light field for the glare-free illumination of the oral cavity.

The light intensity of the central unit can be adjusted electronically at the key pad of the light.



## Common characteristics

### Faceted multi-lens system

A multitude of computer-calculated faceted lenses guarantees homogeneity and lowest shadiness in the light field.

Separately arranged optical systems, each with one LED module generate their own light field, which increases the contrast effect of the OR light.

### Superior colour rendition

With colour rendering indexes  $R_a = 95$  and  $R_{90}(\text{red}) = 94$  the surgeon recognizes clearly the tiniest nuances of colour in tissue. For recognizing the exact colour spectrum of the wound the exact rendition of the red colour range is essential.

$R_{90}(\text{red}) = 94$  means for the surgeon a visibly better recognition of details. The colour spectrum of the wound is rendered naturally with rich contrast. The OT-light clearly provides welcome relief for your eyes.

### Illumination in depth

In the OT-mode you have the possibility to increase the light intensity of the central segment of the OT-light. This enables an optimum illumination of the wound field according to its texture and the shadowing effects.

A high and adequate light intensity is very important especially in cases of narrow and deep wound channels.

# Operating lights for dentistry with Dr. Mach LED technology

## Key pad on the lamp housing

Several light functions can be adjusted electronically, such as:

- Switching ON and OFF
- Illumination in depth
- Dental-mode
- Electronic light intensity control
- SYNC (light combinations only)



## Flow properties

During development high attention was paid to the performance of the new LED OR lights in laminar-flow ceiling systems. The flow-enhancing ring form of all light heads and the minimal surface avoid any heat increase in the surgeon's head area and create a perfect laminar flow performance, being a basic hygienic requirement in surgery.



## Cool light

The LED technology is much more effective than conventional light sources such as halogen bulbs. The heat radiation is reduced to a minimum without using any expensive filter technique. The temperature increase in the surgeon's head area is almost nonexistent.



## Long life-span/low power consumption

The life-span of more than 60.000 operating hours reduces the costs for exchanging and replacing the illuminants considerably, compared with the conventional halogen technology used with former OT-lights. By implementation of the LED technology the power consumption could be reduced partially with more than 50%.



## Hygiene

The disk sealings of the light outlets and the circumferential sealing cord avoid infiltrations of dust, dirt and liquids inside the lamp head.



## Wall panel

The OT-light can be operated at the wall panel (optional equipment against surcharge). The light functions can be adjusted on the wall panel as well as on the key pad of the light.

Several light functions can be adjusted electronically, such as:

- Switching ON and OFF
- Illumination in depth
- Dental-mode
- Electronic light intensity control



## Handle

Merging of light fields is done by turning the sterilisable handle.

The ring at the top of the handle allows the surgeon to set the most important light functions in the sterile area.

The light functions mentioned below can be set at the ring of sterilisable handle:

- Depth light
- Dental-mode
- Light intensity control

# Mach LED 2sc Hybrid OT-light



**Ceiling model**  
for low room height  $\leq 2,80\text{m}$



**Ceiling model**  
for standard room height  $> 2,80\text{m}$

**Mach LED 2sc Hybrid ceiling models**

**Mach LED 2sc Hybrid mobile models**

**Mach LED 2sc Hybrid with wall fixation**



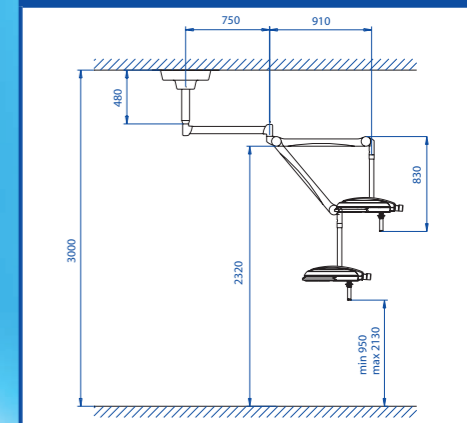
**Mobile light**  
with integrated power supply

**Mobile light**  
with integrated emergency power unit  
operating time 3 hours

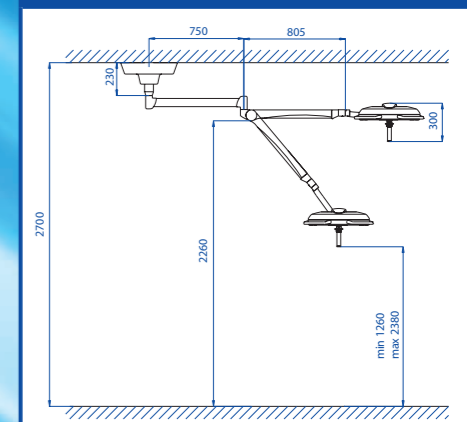
Technical data <sup>(1)</sup> Mach LED 2sc Hybrid light system	OT-mode	Dental-mode
Light intensity Lux at 1 meter distance	115.000	30.000 at 0,7 meter distance
Colour temperature (Kelvin)	4.500	4.500
Colour rendering index $R_a$ <sup>(2)</sup> at 4300 Kelvin	95	95
Focussable size of the light field (in cm)	16 – 24	9 x 5,5 (oval)
Working distance (in cm)	70 – 140	70 – 140
Diameter of the lamp head (in cm)	49	49
Temperature increase in head area	0,5 °C	0,5 °C
Electronic light intensity control at the lamp head	standard	standard
Number of LEDs	21	6
Life-span of the LEDs	60.000 h	60.000 h
Total power consumption	30 W	10 W

<sup>(1)</sup> Further technical details in the data sheet of the lamp, available upon request  
<sup>(2)</sup>  $R_a$  is an average of  $R_1$  = burnt pink,  $R_2$  = mustard yellow,  $R_3$  = yellow green,  $R_4$  = light green,  $R_5$  = turquoise blue,  $R_6$  = skyviolet,  $R_7$  = violet,  $R_8$  = lilac. Maximum value = 100.

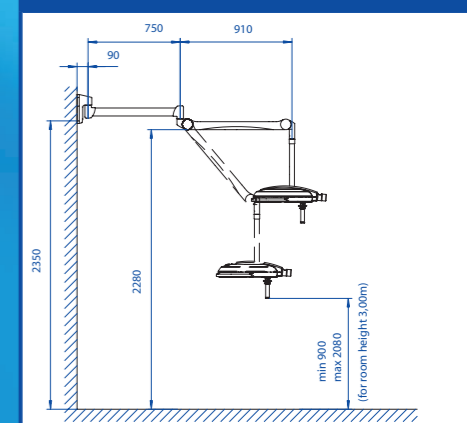
**Ceiling fixation for standard room heights**



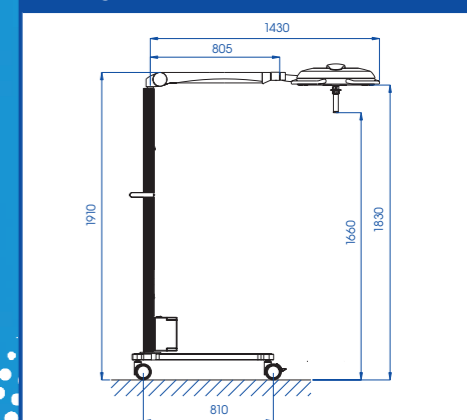
**Ceiling fixation for low room heights**



**Wall fixation**



**Mobile light with four castors**



Dimensions in millimeter

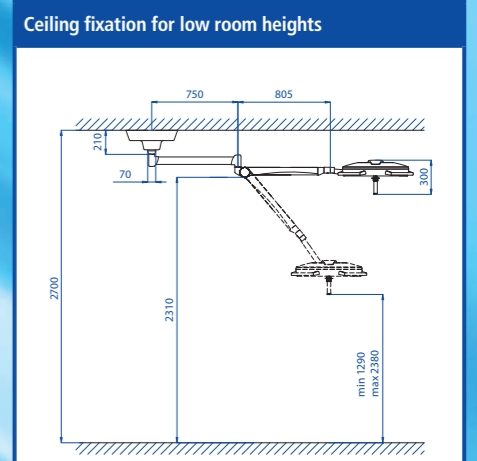
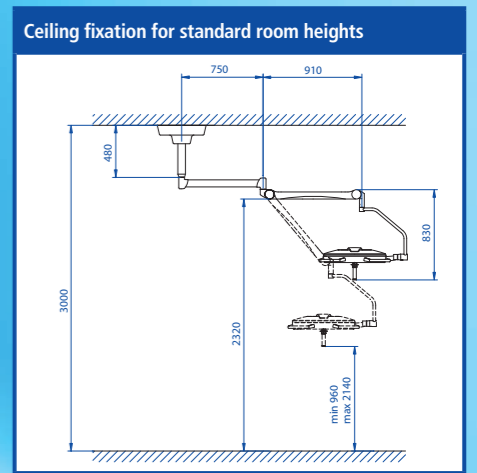
# Mach LED 3sc OT-light



**Ceiling model**  
for low room height ≤ 2,80m

**Ceiling model**  
for standard room height > 2,80m

**Mach LED 3sc ceiling models**



**Mach LED 3sc mobile models**

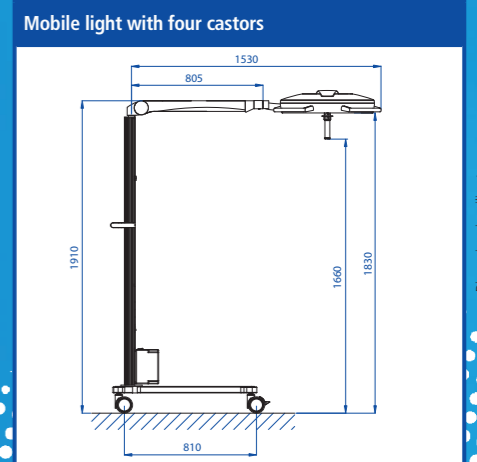
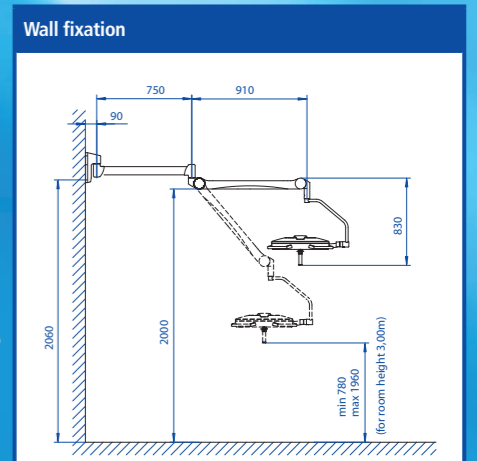
**Mach LED 3sc with wall fixation**



**Mobile light**  
with integrated power supply



**Mobile light**  
with integrated emergency power unit  
operating time 3 hours



Technical data <sup>(1)</sup> light	Mach LED 3sc <sup>(2)</sup>
Light intensity Lux at 1 meter distance	140.000
Colour temperature (Kelvin)	4.500
Colour rendering index R <sub>a</sub> <sup>(3)</sup>	95
Focussable size of the light field (in cm)	17 – 28
Working distance (in cm)	60 – 150
Diameter of the lamp head (in cm)	57
Temperature increase in head area	0,5 °C
Electronic light intensity control at the lamp head	standard
Number of LEDs	28
Life-span of the LEDs	60.000 h
Total power consumption	45 W

<sup>(1)</sup> Further technical details in the data sheet of the lamp, available upon request  
<sup>(2)</sup> optionally available as LED 3mc (Multi Colour)  
<sup>(3)</sup> R<sub>a</sub> is an average of R<sub>1</sub> = burnt pink, R<sub>2</sub> = mustard yellow, R<sub>3</sub> = yellow green, R<sub>4</sub> = light green, R<sub>5</sub> = turquoise blue, R<sub>6</sub> = skyviolet, R<sub>7</sub> = violet, R<sub>8</sub> = lilac. Maximum value = 100.

Camera available against surcharge

Dimensions in millimeter

# Mach LED 3 / 2sc Hybrid operating light with instrument tray

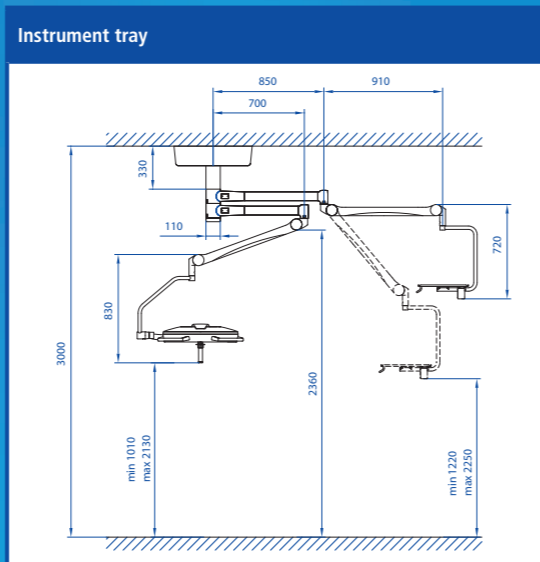


## Instrument tray

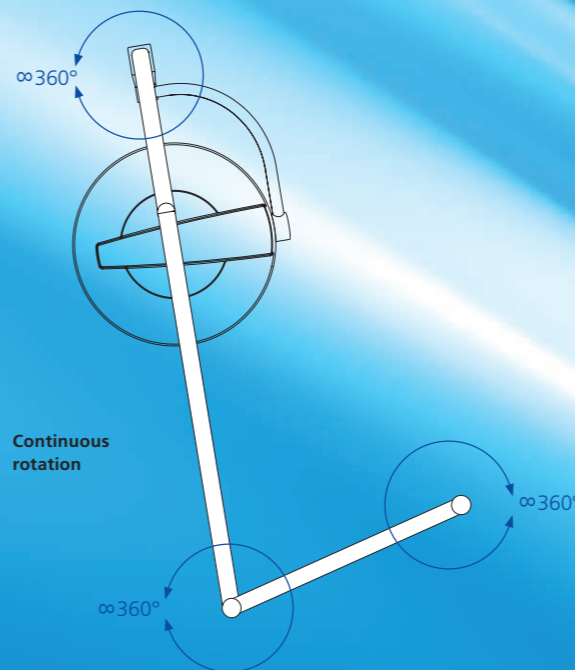
Dimensions: 379 x 479 mm  
special sizes upon request

- max. load capacity 14 kg  
(please state the exact load when placing orders)
- equipped with 1, 2 or 4 electric plugs
- also available without electric

Everything under control:  
an ergonomic combination  
for relaxed working



Camera available against surcharge



# Integrated video system

## Technical data

The Dr. Mach HD-video system offers highest picture quality with a maximum movability of the light.

## Advantages of the new Dr. Mach video system

- 360° continuous rotation in all major joints
- easy-mounting due to video signal transmission through the supply cables or wireless with radio technology
- easy fixation of the camera in another OT
- streaming, conversion or storage solution available on request

## HD resolution

With the transmission of high-resolution pictures of the surgeries and the medical interventions we fulfill your visual requirements.

## Advantages:

A brilliant picture quality with high depth of field and increased detail reproduction means a better recognition of the details in the woundfield by the surgeon or the physician.

## Camera technology

The HD-camera with 30-fold optical zoom is equipped with auto-focus, auto-iris and picture rotation. The camera is operated with a control unit.

## Several camera functions can be adjusted on the control unit, such as:

- Switching ON and OFF
- Switching between 1080i and 720p
- Focus (automatic/manual)
- Iris (automatic/manual)
- Zoom
- Picture rotation
- Frozen image

## Transmission:

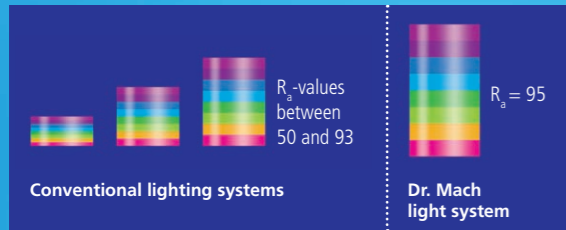
In case of the transmission through cables the video signal is transmitted through sliding contacts. This enables a 360° continuous rotation in all major joints of the OT-light with integrated HD camera. In case of the wireless transmission the video signal is transmitted from the camera to the receiver with radio technology. Installation work on the ceiling is no longer required.

Technical data	Dr. Mach HD camera with digital transmission for visual communication
Objectiv system	30-fold optical zoom, 12-fold digital zoom f = 4.3 to 129 mm F1.6-4.7 auto-focus
Video signal	1080i / 50; 720p / 50 or 1080i / 59.94; 720p / 59.94
Video Output for transmission through cables	HD-SDI*
Video Output for wireless transmission	HDMI
Image points	approx. 2.000.000 pixels
Horizontal resolution	—
Humidity	20 – 80 %
Dimensions (Ø, length)	80 x 150 mm
Weight	900 g
Interference radiation in acc. with	FCC class A

\* HDMI against surcharge

# Examination lights for dentistry

## with Dr. Mach LED technology



### Superiour colour rendition

With outstanding colour rendering indexes  $R_a = 95$  the surgeon recognizes clearly the tiniest nuances of colour in tissue.

The colour spectrum of the wound is rendered naturally with rich contrast. The OT-light clearly provides welcome relief for your eyes.

### Facetted multi-lens system

A multitude of computer-calculated facetted lenses guarantees homogeneity and lowest shadiness in the light field. Separately arranged optical systems, each with one LED module, generate their own light field, which increases the contrast effect of the OT-light. Light intensities of 70.000 Lux can be attained without difficulty.

### Key pad on the lamp housing

The following light functions can be adjusted electronically, such as:

- Switching ON and OFF
- Electronic light intensity control

### Handling

During development high attention was paid to easy handling and high ease of maintenance. Furthermore the flow-enhancing ring form and the minimal surface avoid any heat increase in the surgeon's head area and create a perfect laminar flow performance. The light can be positioned exactly to the wound field with the handle.

### Long life-span/low power consumption

The life-span of more than 60.000 operating hours reduces the costs for exchanging and replacing the illuminants considerably, compared with the conventional halogen technology used with former OT-lights.

By implementation of the LED technology the power consumption could be reduced partially with more than 50%.

### Cool light

The LED technology is much more effective than conventional light sources such as halogen bulbs. The heat radiation is reduced to a minimum without using any expensive filter technique. The temperature increase in the surgeon's head area is almost nonexistent.



Lighting technology – special features of the Mach LED 130 Dental / Dental P

### Dental mode (LED 130 Dental and 130 Dental P)

The dental mode represents the standard configuration of the light. The light can be used as a treatment light for dentistry. The photometric properties of the dental mode are orientated to the standard DIN EN ISO 9680 (Dentistry-Operating lights).

The dental mode is activated by a left-turn of the handle. The outer LED units turn off and the illuminated central LED unit creates an oval-shaped light field for the glare-free illumination of the oral cavity.

The light intensity of the central unit can be adjusted electronically at the key pad of the light.



### Examination light mode (LED 130 Dental only)

When necessary the dental mode can be changed into the examination light mode. The light works as a regular examination light.

The examination light mode is activated by a right-turn of the handle. The central LED unit turns off. The outer LED units create a homogeneous, round, white light field.

The light intensity can be adjusted electronically at the key pad of the light.



### Composite mode (LED 130 Dental P only)

When necessary the dental mode can be changed into the composite mode. This operating mode is used to avoid a premature hardening of composite fillings.

The composite mode is activated by a right-turn of the handle. The central LED unit turns off. The outer LED units create a homogeneous, round, orange coloured light field. The light does not contain any UV-content and a minimum of blue colour content, which avoids the premature hardening of the composite fillings.

The light intensity can be adjusted electronically at the key pad of the light.





# Mach LED 130 Dental



LED 130 Dental P  
in composite mode



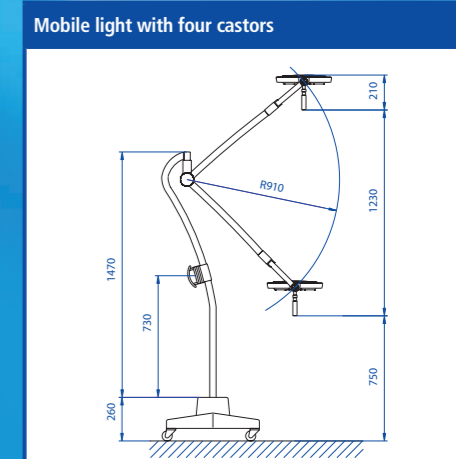
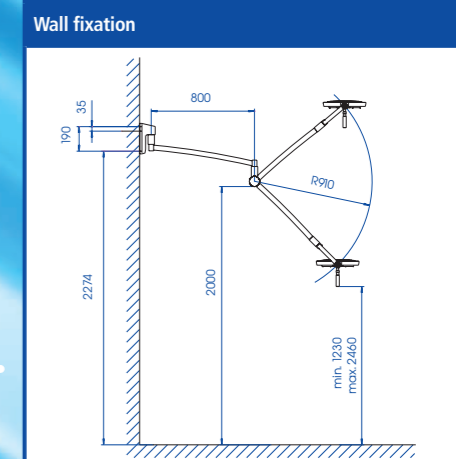
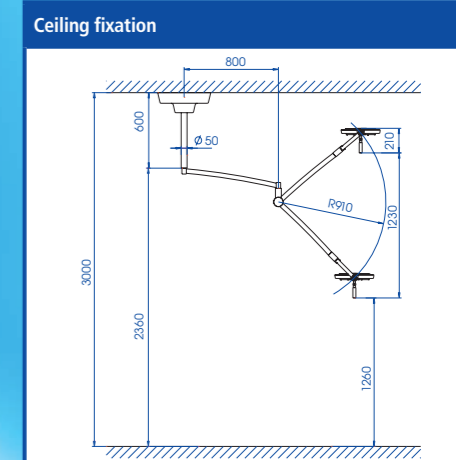
Mach LED 130 with ceiling fixation



Mach LED 130 with wall fixation



LED 130 with four castors



Technical data <sup>(1)</sup> LED 130 Dental light system	LED 130 Dental		LED 130 Dental P	
	Dental mode	Exam. light mode	Dental mode	Composite mode
Light intensity Lux	40.000 / 0,7 meters	65.000 / 0,7 meters	40.000 / 0,7 meters	65.000 / 0,7 meters
Colour temperature (Kelvin)	4.500	4.500	4.500	N.A. <sup>(3)</sup>
Colour rendering index R <sub>a</sub> <sup>(2)</sup> at 4300 Kelvin	95	95	95	N.A. <sup>(3)</sup>
Light field size (in cm)	13 x 8 (oval)	12	13 x 8 (oval)	12
Working distance (in cm)	70 – 140		70 – 140	
Light head diameter (in cm)	33		33	
Temperature increase in the head area	0,5 °C		0,5 °C	
Elektronic light intensity control at the light head	standard		standard	
Number of LEDs	7	12	7	12
Life-span of the LEDs	60.000 h		60.000 h	
Total power consumption	16 W	20 W	16 W	20 W

(1) Further technical details in the data sheet of the lamp, available upon request  
 (2) R<sub>a</sub> is an average of R<sub>1</sub> = burnt pink, R<sub>2</sub> = mustard yellow, R<sub>3</sub> = yellow green, R<sub>4</sub> = light green, R<sub>5</sub> = turquoise blue, R<sub>6</sub> = skyviolet, R<sub>7</sub> = violet, R<sub>8</sub> = lilac. Maximum value = 100.  
 (3) Not applicable (see page 15)

# Mach LED 150 small operating light



Mach LED 150 FP / LED 150 F / LED 150  
130.000 Lux / 110.000 Lux / 110.000 Lux

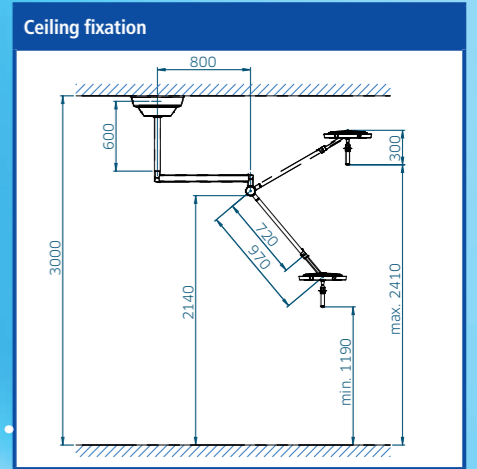
Handy small operating light with  
the optional advantage of focussing

- (1) Further technical details in the data sheet of the lamp, available upon request
- (2) external power supply
- (3) F-models with focussing
- (4) models with fixed focus
- (5)  $R_a$  is an average of  $R_1$  = burnt pink,  $R_2$  = mustard yellow,  $R_3$  = yellow green,  $R_4$  = light green,  $R_5$  = turquoise blue,  $R_6$  = skyviolet,  $R_7$  = violet,  $R_8$  = lilac. Maximum value = 100.

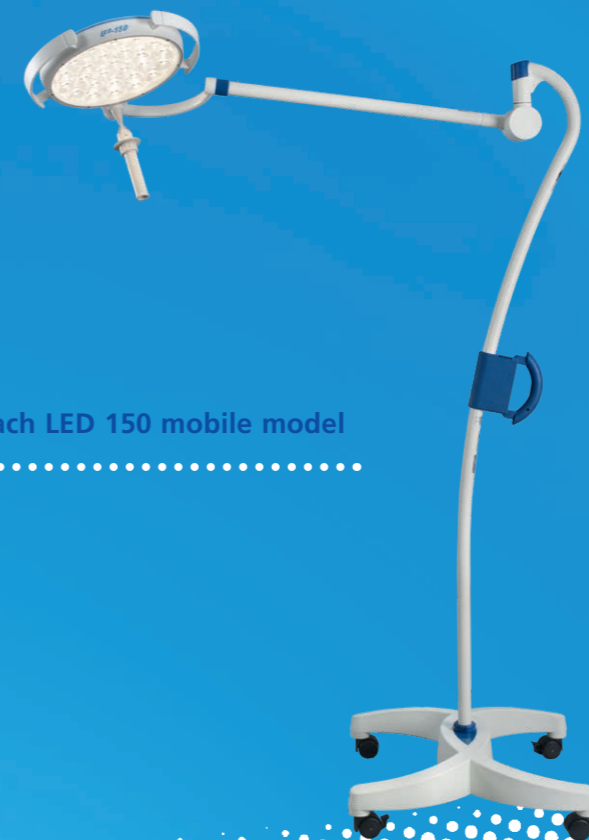
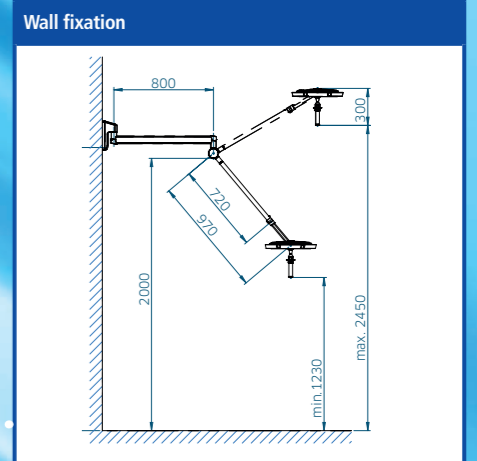
Technical Data <sup>(1)</sup> Mach LED 150 light system <sup>(2)</sup>	Mach LED 150 FP <sup>(3)</sup>	Mach LED 150 F <sup>(3)</sup>	Mach LED 150 <sup>(4)</sup>
Light intensity in Lux at 1 meter distance	130.000	110.000	110.000
Colour temperature (Kelvin)	4.500	4.500	4.500
Colour rendering index $R_a$ <sup>(5)</sup>	95	95	95
Focussable light field size (in cm)	17 – 24	18 – 25	19 (fixed focus)
Working distance (in cm)	70 – 140	70 – 140	70 – 140
Diameter of light head (in cm)	40	40	40
Temperature increase in the head area	0,5 °C	0,5 °C	0,5 °C
Electronic light intensity control at the lamphead	standard	standard	standard
Light source LED	26	26	26
Life-span of the LEDs	60.000 h	60.000 h	60.000 h
Total power consumption	35 W	35 W	35 W



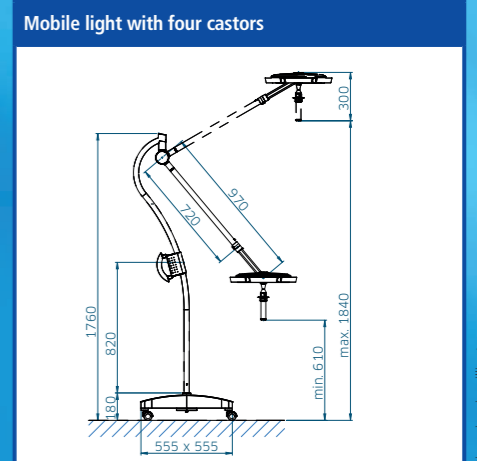
Mach LED 150 with ceiling fixation



Mach LED 150 with wall fixation



Mach LED 150 mobile model



Dimensions in millimeter

# Dental Solutions

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