Dental Solutions

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Dr. Mach
Medical lighting
+Technology

Dental **Solutions**

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 professionality by innovative techology 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

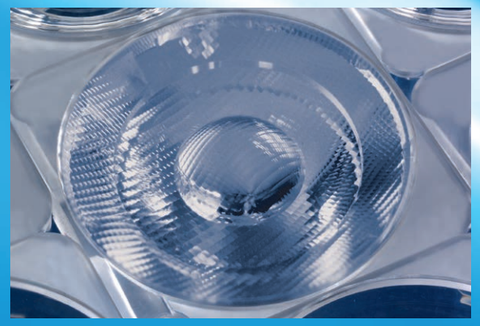
The light can be used as a normal OT-light for the oral and maxillofacial surgery. All functions of the light are available: changing of the light field size, depth light, light intensity control.

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.



Conventional lighting systems	Dr. Mach light system
R_a-values between 20 und 70	R_9 = 94 R_a = 95

Common characteristics

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 OR light.

Superiour colour rendition

With colour rendering indexes R_a = 95 and R_9(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_9(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

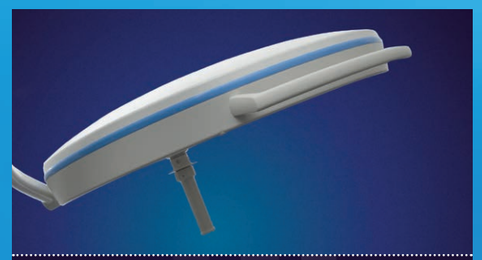
During development high attention was paid to the performance of the new LED OR lights in laminar-flow ceiling systems. The flow-enhancing ring form of all light heads and the minimal surface avoid any heat increase in the surgeon's head area and create a perfect laminar flow performance, being a basic 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 40.000 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

Technical data [1] Mach LED 2sc Hybrid light system	OT-mode	Dental-mode
Light intensity Lux	115.000 at 1 meter distance	30.000 at 0,7 meter distance
Colour temperature (Kelvin)	4500	4500
Colour rendering index R_a [2] 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	≥ 40.000 h	≥ 40.000 h
Total power consumption	30 W	10 W

(1) Further technical details in the data sheet of the lamp, available upon request

(2) 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 model

for low room height ≤ 2,80m

Ceiling model

for standard room height > 2,80m

Mach LED 2sc Hybrid ceiling models

Mach LED 2sc Hybrid mobile models

Mobile light

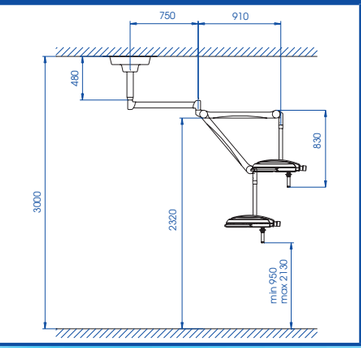
with integrated power supply

Mobile light

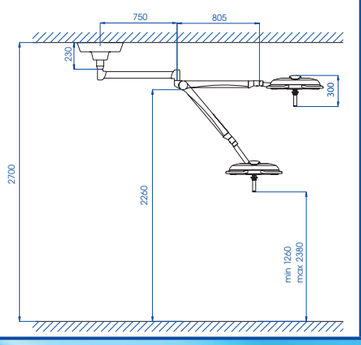
with integrated emergency power unit operating time 3 hours

Mach LED 2sc Hybrid with wall fixation

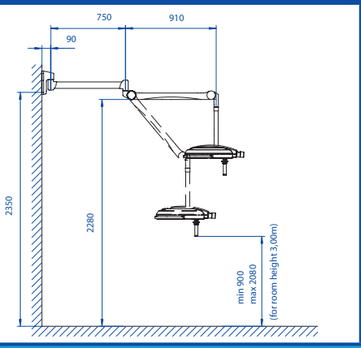
Ceiling fixation for standard room heights



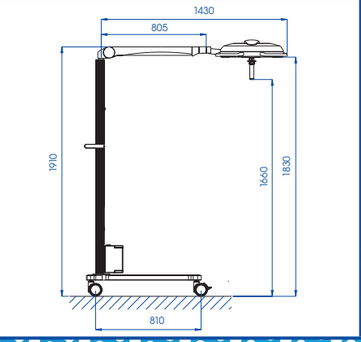
Ceiling fixation for low room heights



Wall fixation



Mobile light with four castors



Dimensions in milimeter

Mach LED 3sc

OT-light

Mach LED 3sc with wall fixation

Technical data [1] light	Mach LED 3sc [2]
Light intensity Lux at 1 meter distance	140.000
Colour temperature (Kelvin)	4500
Colour rendering index R_a [3]	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 LED´s	28
Life-span of the LED´s	> 40.000 h
Total power consumption	45 W

(1) Further technical details in the data sheet of the lamp, available upon request
(2) optionally available as LED 3mc (Multi Colour)
(3) 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 model

for low room height ≤ 2,80m

Mach LED 3sc ceiling models

Ceiling model

for standard room height > 2,80m

Mach LED 3sc mobile models

Mobile light

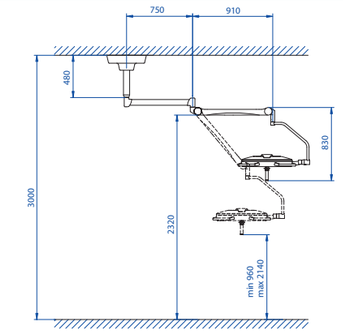
with integrated power supply

Camera available against surcharge

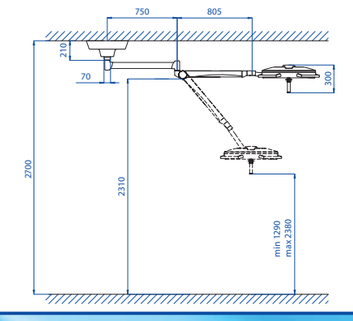
Mobile light

with integrated emergency power unit operating time 3 hours

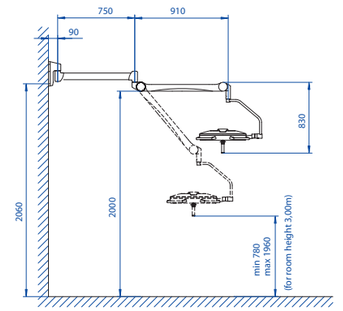
Ceiling fixation for standard room heights



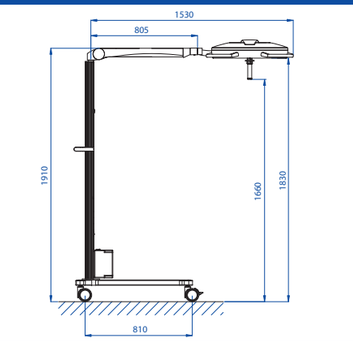
Ceiling fixation for low room heights



Wall fixation



Mobile light with four castors



Dimensions in millimeter

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

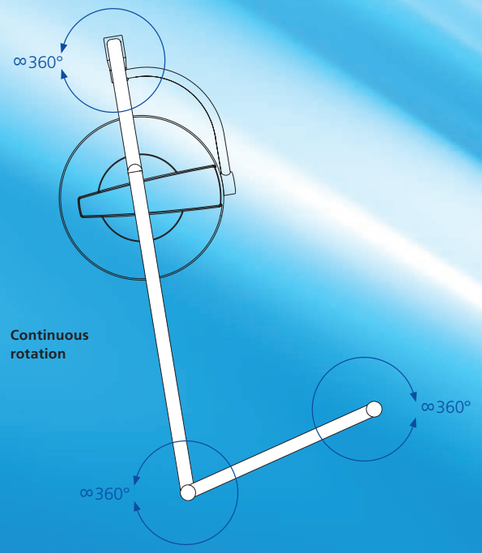
Instrument tray

Dimensions: 379 x 479 mm
special sizes upon request

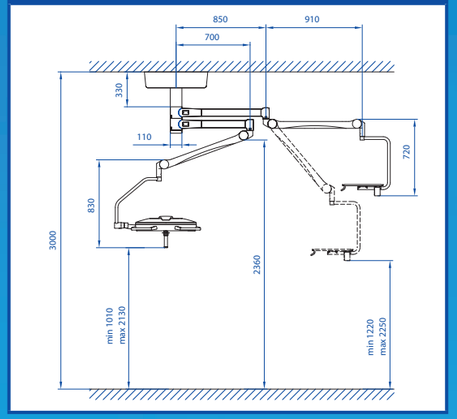
- max. load capacity 14 kg
  (please state the exact load when placing orders)
- equipped with 1, 2 or 4 electric plugs
- also available without electric

Everything under control:

an ergonomic combination for relaxed working



Instrument tray



Camera available against surcharge

Technical data Dr. Mach camera	HD	MFB-MO (SD)
	High Definition camera with digital transmission for visual communication	Colour image camera for visual communication (PAL)
Objectiv system	30-fold optical zoom, 12-fold digital zoom f = 4.3 to 129 mm F1.6-4.7 auto-focus	36-fold optical zoom, 12-fold digital zoom f = 3.4 to 122.4 mm F1.6-4.5 auto-focus
Video signal	HD: 1080i/50; 720p/50 or 1080i/59.94; 720p/59.94	–
Video Output	HD-component	Y/C
Image points	approx. 2.000.000 pixels	752 (H) x 582 (V)
Horizontal resolution	–	Over 530 lines
Humidity	20 – 80%	20 – 85%
Dimensions (Ø, length)	80 x 150 mm	80 x 150 mm
Weight	900 g	900 g
Interference radiation in acc. with	FCC class A	FCC class A

Integrated video system HD Camera / SD Camera

Free turning and swivelling

The Dr. Mach HD- and SD-video systems offer highest picture quality with a maximum movability of the light.

Advantages of the new Dr. Mach video system

- uniform preparation for HD- and SD-camera
- 360° continuous rotation in all major joints
- easy-mounting due to video signal transmission through the supply cables
- camera control with a serial interface or a second control unit
- 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 and the SD-camera with 36-fold optical zoom are equipped with auto-focus, auto-iris and picture rotation. The cameras are operated with a control unit.

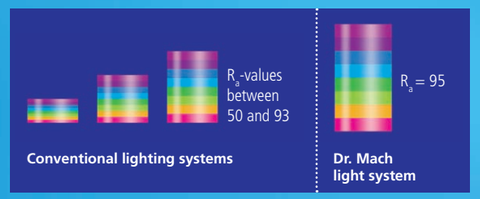
Several camera functions can be adjusted on the control unit, such as:
- Switching ON and OFF
- Switching between 1080i and 720p – Dr. Mach HD-camera only
- Focus (automatic/manual)
- Iris (automatic/manual)
- Zoom
- Picture rotation
- Frozen image

Transmission:

The HD-SDI signal is transmitted through sliding contacts. This enables a 360° continuous rotation in all major joints of the OT-light with integrated HD-camera.

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

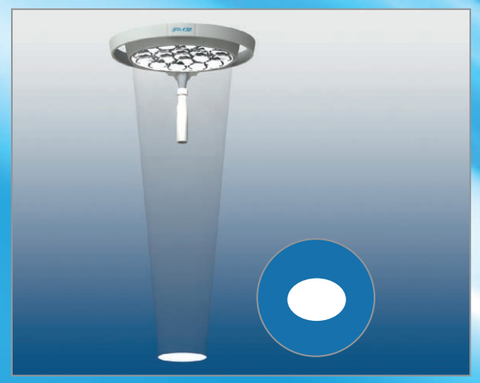
During development high attention was paid to easy handling and high ease of maintenance. Furthermore the flow-enhancing ring form and the minimal surface avoid any heat increase in the surgeon's head area and create a perfect laminar flow performance. The light can be positioned exactly to the wound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

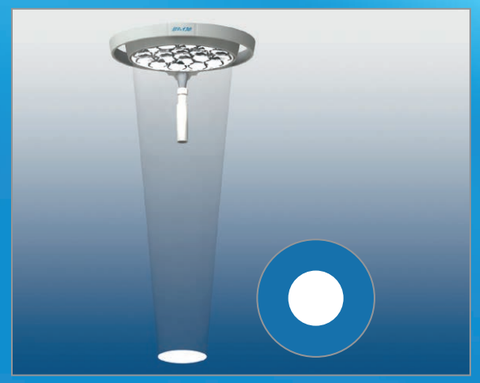
Long life-span / low power consumption

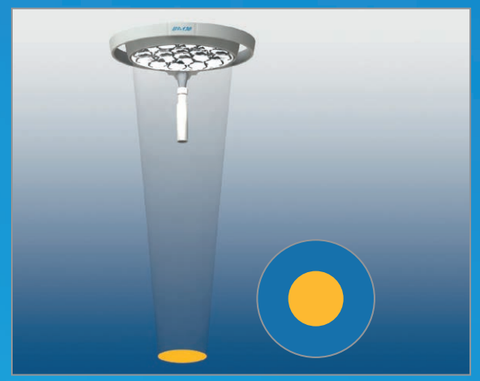
The life-span of more than 40.000 operating hours reduces the costs for exchanging and replacing the illuminants considerably, compared with the conventional halogen technology used with former OT-lights.
By implementation of the LED technology the power consumption could be reduced partially with more 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.

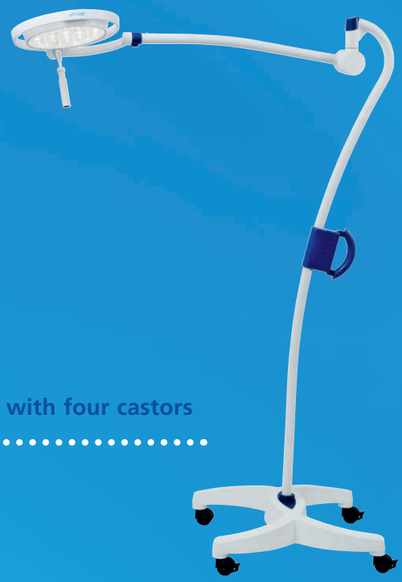
The light intensity can be adjusted electronically at the key pad of the light.

Mach LED 130 Dental

LED 130 Dental P
in composite mode

Mach LED 130 with ceiling fixation

Mach LED 130 with wall fixation

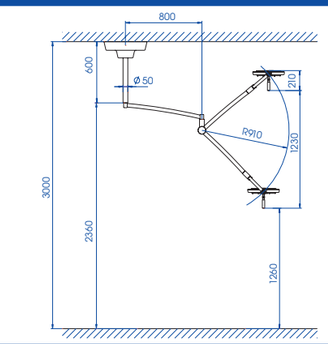


LED 130 with four castors

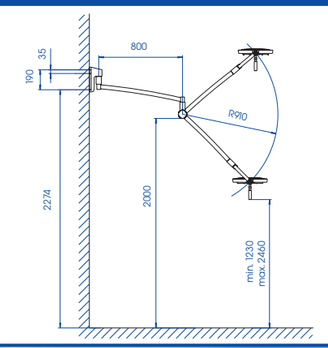
Technical data [1] LED 130 Dental light system	LED 130 Dental		LED 130 Dental P	
	Dental mode	Exam. light mode	Dental mode	Composite mode
Light intensity Lux	40.000 / 0,7 meters	65.000 / 1 meter	40.000 / 0,7 meters	65.000 / 1 meter
Colour temperature (Kelvin)	4300	4300	4300	N.A. [3]
Colour rendering index R_a [2] at 4300 Kelvin	95	95	95	N.A. [3]
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 LED's	7	12	7	12
Life-span of the LED's	≥ 40.000 h		≥ 40.000 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_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.
(3) Not applicable (see page 15)

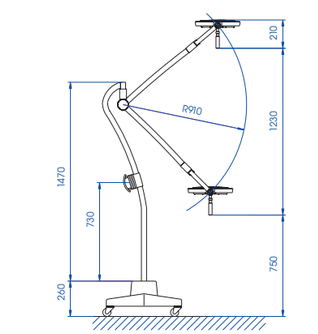
Ceiling fixation



Wall fixation



Mobile light with four castors



Dimensions in milimeter

Mach LED 150 small operating light

Mach LED 150 F / LED 150
100.000 Lux / 80.000 Lux

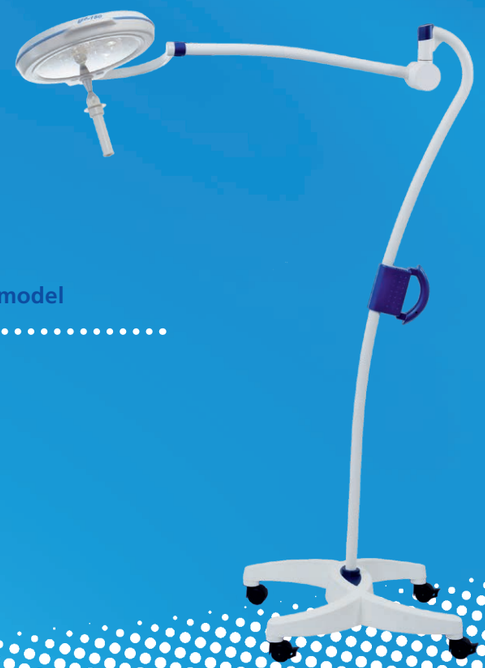
Handy small operating light with the optional advantage of focussing

Technical Data [1] Mach LED 150 light system [2]	Mach LED 150 F [3]	Mach LED 150 [4]
Light intensity in Lux at 1 meter distance	100.000	80.000
Colour temperature (Kelvin)	4300	4300
Colour rendering index R_a [5]	= 95	= 95
Focussable light field size (in cm)	14 – 25	17 (fixed focus)
Working distance (in cm)	70 – 140	70 – 140
Diameter of light head (in cm)	38	38
Temperature increase in the head area	0,5 °C	0,5 °C
Electronic light intensity control at the lamphead	standard	standard
Light source LED	24	24
Life-span of the LEDs	≥ 40.000 h	≥ 40.000 h
Total power consumption	35 W	35 W

(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.

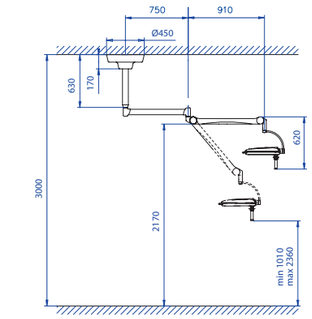
Mach LED 150 with ceiling fixation

Mach LED 150 with wall fixation

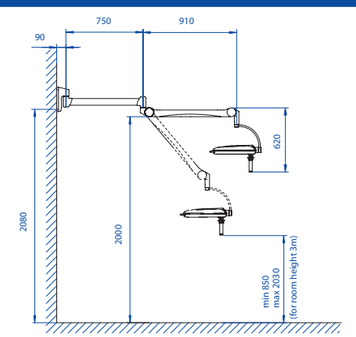


Mach LED 150 mobile model

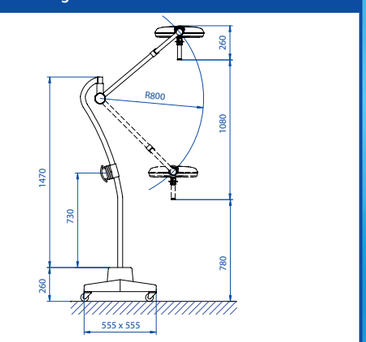
Ceiling fixation



Wall fixation



Mobile light with four castors



Dimensions in millimeter