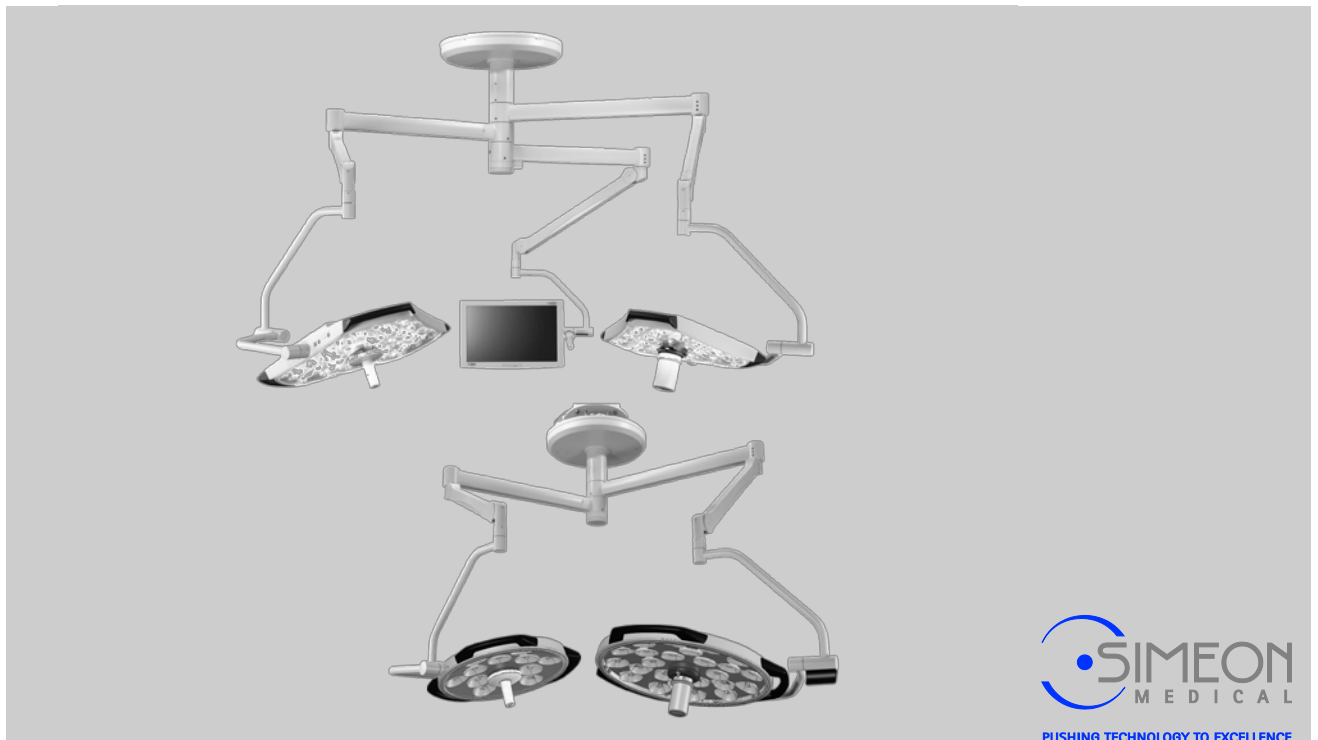


Installation Instructions

Surgical LightingSim.LED
450/500/700/5000/7000 SC/MC



Doc. ID: 100-0010179-EN – V. 1.7

CO 003-01163

**Please read these instructions
before starting any work!**

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1 General

1.1 Information on these Installation Instructions

Any changes to this medical device are fundamentally not allowed.

These Installation Instructions enable the safe and efficient assembly and installation of the Sim.LED 450/500/700/5000/7000 SC/MC. The Installation Instructions Service Manual must be stored so that they are accessible to the lighting manufacturer's service personnel or personnel authorised by the manufacturer. The assembly sequence must be followed in ascending order.



As a rule, medical devices may only be installed, operated, controlled and maintained by persons who possess the required training, knowledge and experience.

Installation, maintenance and repairs may only be conducted by authorised, qualified personnel as a minimum requirement. Authorisation is granted upon completion of a training course and receipt of a certificate from the manufacturer. The qualified personnel in question must have carefully read these Installation Instructions and understood their contents before starting any work. The basic requirement for a safe work process is the adherence to all safety and handling instructions in these Installation Instructions in ascending order. Furthermore, local regulations for working with medical equipment in sterile rooms such as operating theatres, apply.

The illustrations in this manual are provided for basic understanding and could deviate from the actual design. Service work is described in a separate Service Manual. Operation of the lights and accessories is described in the respective Instructions for Use.

Safety information

Safety information in these Installation Instructions is identified by symbols.

 WARNING	<p>Risk of death or severe bodily injury!</p> <p>Non-observance could possibly result in death or severe bodily injury!</p>
 CAUTION	<p>Risk of injury!</p> <p>Non-observance could result in bodily injury!</p>
<p>NOTICE</p>	<p>Risk of material damages: Non-observance of the instructions may result in damage to or destruction of the product or other objects, as well as loss of data or loss of working hours.</p>

Symbols

- ☞ Indicates handling instructions.
- ⇒ Indicates a status or an automatic sequence as a result of a handling step
- ↪ *“Reference title”, page 24*
is a cross-reference to a chapter in this document.
- ↪ *Instructions for Use of this lighting*
is a cross-reference to a separate document.

Cable colours in circuit diagrams

Abbreviation	Cable colour (en)	Cable colour (ger)
BK	Black	Schwarz
BU	Blue	Blau
BN	Brown	Braun
GN	Green	Grün
GNYE	Green-Yellow	Grün-gelb
OG	Orange	Orange
RD	Red	Rot
YE	Yellow	Gelb
TR	Transparent	Transparent

Copyright protection

These Installation Instructions are copyright-protected.

Transferring these Installation Instructions to a third party, reproducing them in any type or form – even if only partial – and using and/or disseminating their contents are prohibited without written authorisation from the manufacturer.

Infringements will be liable to claims for damages.
We reserve the right to assert further claims.

Limitation of liability

All specifications and instructions in these Installation Instructions have been compiled under consideration of applicable norms and standards, the current state of the art and our many years of knowledge and experience.

We will accept no liability. The warranty and guarantee will become inapplicable in the event of damages resulting from:

- Non-observance of these Installation Instructions
- Non-observance of the Service Manual
- Non-adherence to the designated use / specific function
- Failure to document and observe the defined maintenance plan and safety-related inspections
- Start-up currents and overvoltage
- Use by non-qualified personnel
- Modifications conducted independently
- Technical modifications
- Use of a defective or improperly repaired unit
- Use of unauthorised spare parts or accessories

The actual scope of delivery may deviate from the explanations or illustrations provided in this manual in the case of special designs, the use of additional order options, or due to the most recent technical changes.

1.2 Explanation of symbols

The following symbols can be found on the type plate and/or packaging. The symbols must always be observed.



Adhere to the Instructions for Use



Electric shock: Warns of an electric shock which can cause severe injury or even death.



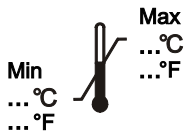
Collapse of bearer arm system: Warns of the bearing arm system suddenly collapsing due to faulty mounting.



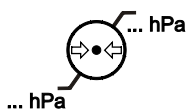
Cutting injury:
Warns of cuts. Wear protective gloves.



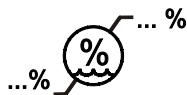
Spring arm snapping up: Warns of the spring arm snapping up suddenly when the adaption or end device is disassembled.



Specifications on minimum and maximum ambient temperature for storage and transportation



Specifications on minimum and maximum air pressure for storage and transportation.



Specifications on minimum and maximum air humidity for storage and transportation



The arrows point towards the top side of the package. They must always point upwards; otherwise, the contents could be damaged.



This symbol identifies packages that contain breakable or sensitive contents. Handle the package carefully, do not allow it to drop and do not subject it to any blows.



Protect the package from wetness and keep dry.



Date of manufacture and manufacturer's address



Article number



Serial number



Protective grounding (ground)



Medical Equipment – General Medical Equipment

ONLY COMPLIES WITH ANSI/AAMI ES60601-1 (2005), CAN/CSA-C22.2 No. 60601-1 (2008), IEC 60601-2-41:2009, UL 606011:2006, CAN/CSA-C22.2 No. 601.1 AND IEC 60601-2-41:2000 STANDARDS WITH RESPECT TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS



CE mark of conformity

1.3 Spare parts

Procure spare parts from your authorised dealer or directly from the manufacturer. For the address, see page 2.



Risk of injury due to the use of incorrect spare parts!

The use of incorrect or defective spare parts may place personnel and patients at risk as well as cause damage, malfunctions, or a total breakdown of the unit.

- ☞ Only use original manufacturer spare parts or manufacturer-approved spare parts.
- ☞ If uncertain, always contact the manufacturer.

1.4 Warranty provisions

The warranty provisions are contained in the manufacturer's General Business Terms and Conditions.

The manufacturer's warranty is voided if unauthorised spare parts and devices are used. Authorised devices can be found in the valid Instructions for Use. Authorised spare parts can be found in the valid Spare Parts Price List.

1.5 Technical Service

Our Technical Service is available to provide technical information. For contact information, see page 2.

In addition, our personnel is always interested in hearing about new

information and experiences that may arise from use of the product and that may be valuable for the improvement of our products.

Claims of any type due to damages caused by misuse, alteration or modification of the light are excluded.

1.6 Intended use

The concept of intended use also includes adherence to all specifications in these Installation Instructions and the separate Instructions for Use. Any use that exceeds the intended use, and any other kinds of uses, are considered to be incorrect uses.

⚠ WARNING

Danger due to incorrect use!

Incorrect use of the unit may lead to dangerous situations. The following are especially considered to be incorrect uses:

- Use of the unit in facilities that have not been built in compliance with applicable standards and guidelines regulating the construction of medical facilities.
- Use of the unit in explosion-prone areas.
- Use of a damaged unit.
- Opening of the unit.
- Use of the unit by unqualified personnel.
- Use of the unit when objects are hanging from its extension arm, spring arm or light head.

Any type of claims against the manufacturer due to damages caused by misuse, alteration or modification of the light are excluded.

1.7 Incoming inspections

Inspect your delivery against the delivery slip for completeness and integrity, immediately after receipt. The goods must be checked for transport damages. The manufacturer or dealer must be notified of any potential transport damages within 5 business days.

⚠ WARNING

Risk of injury due to falling objects!

Parts may fall off of damaged goods.

Any goods which may be damaged may not be installed and must be reported to the manufacturer immediately.

1.8 Duties of the operator

Responsibility to instruct

The operator must inform himself of all applicable accident prevention and hygiene regulations, and must additionally conduct a risk assessment at the site where the unit will operate in order to identify any risks posed by the particular work conditions. The regulations must be implemented in the form of instructions for operation of the unit.

During the entire time that the unit is in use, the operator must check whether the operating instructions that he prepared comply with current technical regulations and revise them if necessary.

The operator must clearly establish and manage responsibilities in the areas of installation, operation, troubleshooting, maintenance and cleaning.

The operator must ensure that all employees who handle the unit have read and understood the Instructions for Use.

Furthermore, he must train personnel at regular intervals and inform them of all dangers. He must also place safeguards so that unauthorised persons do not use the unit.

The operator must ensure that the maintenance intervals and technical safety inspections described in these Installation Instructions are adhered to and documented.

The operator must ensure that only approved accessories and accessories released by the manufacturer are used together with the unit.

Technical safety inspections

The operator must allow technical safety inspections to be conducted annually.

Technical safety checks may only be conducted by the manufacturer's personnel, or by authorised specialists who have received written approval from the manufacturer.

The protocol prepared by the authorised specialist, detailing the measurement procedures, measurement results, and other evaluations, must be kept until the lighting is disposed of completely.

No liability in the event of non-compliance with time limits!

The manufacturer assumes no liability for personal injury or material damages if technical safety inspections are not contracted and conducted within the time limits provided.

Translation

In the case of translations into other languages, the German version shall be binding. Installation Instructions

Notification of accidents and damages

Malfunctions or unit defects that lead to bodily injury must be immediately notified to the authorities in charge and to the manufacturer.


The authorities in charge may request that the operator submit the incident being notified to a technical safety evaluation by an authorised expert, at its own expense, and that the evaluation be submitted in writing to such authorities. The authorised expert will be selected in consultation with the authorities in charge.

The technical safety evaluation will include determinations on:

- the cause of the incident
- the proper condition of the unit
- the risk situation following rectification of the fault
- the procurement of new knowledge as a result of the incident, requiring revised or additional precautionary measures to those already described

1.9 Personnel requirements/qualifications

As a rule, the medical devices described in these Installation Instructions may only be installed, operated, controlled and maintained by persons who have been trained and authorised to do so by S.I.M.E.O.N. Medical GmbH & Co. KG.


 WARNING	<p>Risk of death due to faulty installation or faulty initial start-up!</p> <p>Errors during the installation or initial start-up may result in life-threatening situations and cause considerable material damages. For that reason, please note the following:</p> <ul style="list-style-type: none"> ☞ The installation and initial start-up may only be conducted by the manufacturer's personnel or by persons authorised by the manufacturer. ☞ The manufacturer must also be involved when conducting unit relocations at a later time. ☞ Unauthorised installation and relocations are prohibited.
--	--

1.10 Dismantling and disposal

Disposal of the unit

The unit must be dismantled and undergo environmentally friendly disposal.

Dismantling may only be conducted by trained, qualified personnel.

 WARNING	<p>Risk of death due to improper dismantling!</p> <p>Errors during dismantling may result in life-threatening situations and cause significant material damages.</p> <ul style="list-style-type: none"> ☞ Only allow trained, qualified personnel to conduct dismantling. ☞ The manufacturer must also be involved when conducting unit relocations at a later time. ☞ Unauthorised dismantling and relocations are prohibited.
--	---

Disposal of packaging

The packaging must undergo environmentally friendly disposal.

The packaging may be returned to the manufacturer.

2 Transportation, packaging and storage

The installation and initial start-up should be exclusively conducted by the manufacturer's personnel or by persons authorised by the manufacturer.

The case may be, however, that operators or the operator's maintenance personnel are entrusted with the handling of packaged items during the course of installation and further use. In such a case, the following instructions must be heeded!

NOTICE

Risk of material damages due to improper transportation!

Transported items may fall or topple over as a result of improper transportation. This can result in costly material damages.

- ☞ When unloading items during delivery, and in the case of in-house transportation, it is important to proceed cautiously and to heed the instructions on the packaging.
- ☞ Use only the designated suspension points.
- ☞ Do not remove packaging until immediately before assembly.

2.1 Transportation inspection

Inspect the delivery immediately upon receipt for completeness and possible transportation damages.

If any exterior transportation damages are discovered, proceed as follows:

- ☞ Do not accept delivery or only accept it conditionally.
- ☞ Write down the extent of damages on the transportation documents or on the transportation company's delivery note.
- ☞ Initiate a claim.

NOTICE

Submit a claim for every fault as soon as it is discovered. Claims for damages can only be asserted within the claim period in effect.

2.2 Packaging

The individual items have been packaged in accordance with the expected transportation conditions. Only environmentally friendly materials were used for the packaging.

The packaging should protect the individual components from transportation damages, corrosion, or other damages, up until the time of assembly. Therefore, do not destroy the packaging and only remove it shortly before assembly. Dispose of packaging materials in accordance with valid legal regulations and local standards.

NOTICE**Risk of environmental damage due to improper disposal!**

Packaging materials are valuable raw materials and can, in many cases, be reused or be sensibly processed and recycled. The improper disposal of packaging materials may result in danger to the environment.

- ☞ Dispose of packaging materials in an environmentally friendly way.
- ☞ Observe the applicable local disposal regulations. If needed, contract a specialist company for such disposal.

2.3 Transport

Transport all packaged items under the following conditions:

- ☞ Do not store outdoors.
- ☞ Store in a dry and dust-free environment.
- ☞ Transport temperature: -10 °C to 50 °C
- ☞ Protect from sunlight.
- ☞ Avoid any mechanical vibrations.
- ☞ Ambient temperature: - 10°C to max. + 50°C
- ☞ Relative air humidity: min. 10% max. 90 %
- ☞ Air pressure min. 500 hPa max. 1060 hPa
- ☞ When transporting parts for longer than three months, check the general condition of all parts and their packaging regularly.
- ☞ If required, recondition or replace the preservation measures.

2.4 Storage

Store the packaged items under the following conditions:

- ☞ Do not store outdoors.
- ☞ Store in a dry and dust-free environment.
- ☞ Do not expose to any aggressive media.
- ☞ Protect from sunlight.
- ☞ Avoid any mechanical vibrations.
- ☞ Storage temperature: -10 °C to max. 50 °C
- ☞ Relative air humidity: min. 10% max. 90 %
- ☞ Air pressure min. 500 hPa max. 1060 hPa
- ☞ When storing parts for longer than three months, check the general condition of all parts and their packaging regularly.
- ☞ If required, recondition or replace the preservation measures.

NOTICE	Storage instructions that exceed the requirements mentioned herein may be found on the packaged items. These must be adhered to accordingly!
---------------	--

3 Design and function

3.1 Variants

The different variants of the Surgical Lighting Sim.LED 450/500/700/5000/7000 SC/MC surgical lights are exclusively intended for the illumination of treatment and surgical areas used in medicine. The mobility of the light heads is guaranteed through a system consisting of extension arms, spring arms, a cardanic, and light heads. The surgical lights and the camera, as an optional accessory, are operated through the control panels on the light heads and on the wall. The light head is positioned using the unsterile handles and the sterilisable handle.

The Surgical Lighting Sim.LED 450/500/700/5000/7000 SC/MC surgical light is available in different variants.

3.1.1 Light head

The various type designations generally denote light heads with different numbers and designs of Sim.PODs (reflector/LED unit),

↳ "Technical data", page 119.



Sim.LED 5000 (SC)
24 reflectors



Sim.LED 7000 (SC)
32 reflectors



Sim.LED 450 (SC)
12 reflectors



Sim.LED 500 (SC)
18 reflectors



Sim.LED 700 (MC, with
Sim.CAM)
24 reflectors

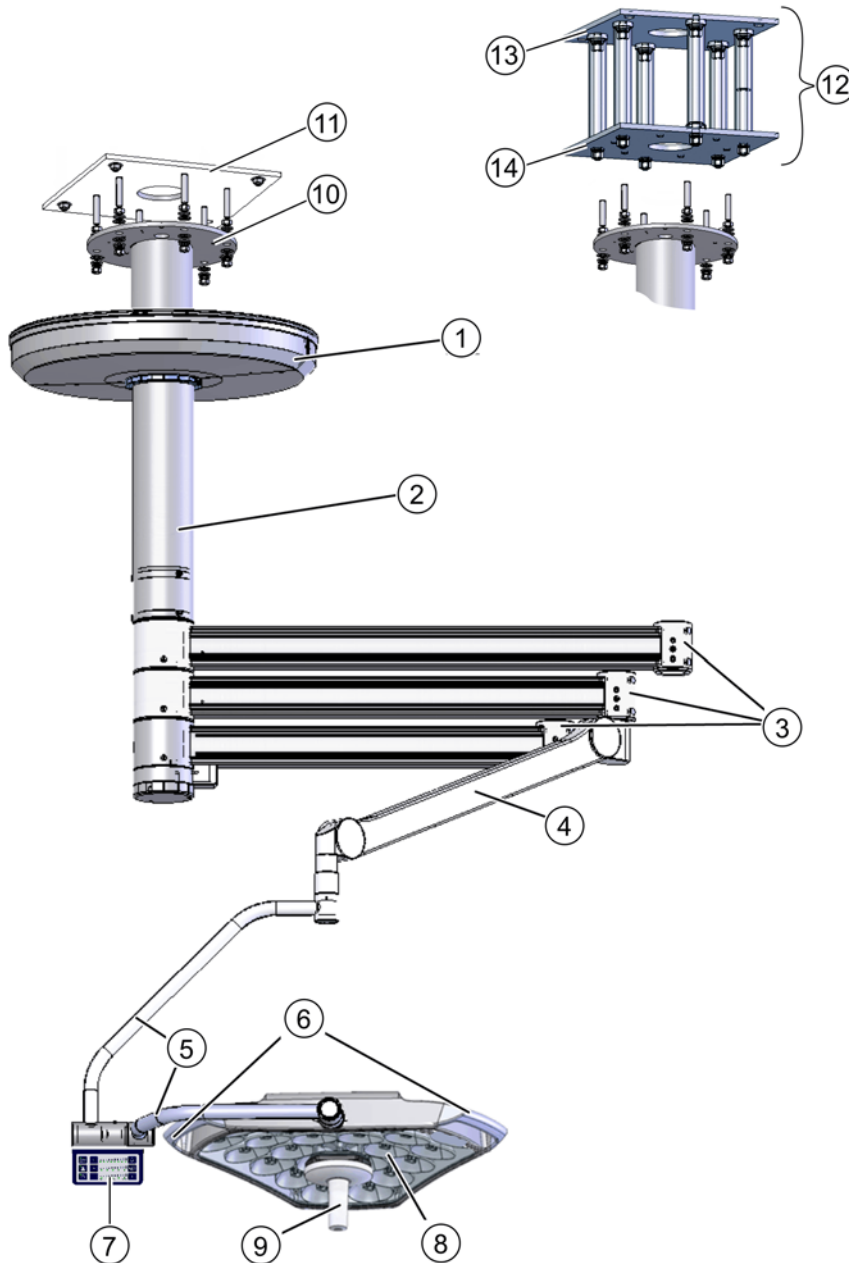
Multi-colour lights (MC) allow you to select the factory-set colour temperatures on the control panel,

↳ *Instructions for Use Sim.LED 450/500/700 and Sim.LED 5000/7000.*

3.1.2 Camera

Lights with camera preparation can transmit/process the signals of a Sim.CAM SD or Sim.CAM HD TOUCH accordingly, ↳ *Instructions for Use Sim.LED 450/500/700 and Sim.LED 5000/7000.*

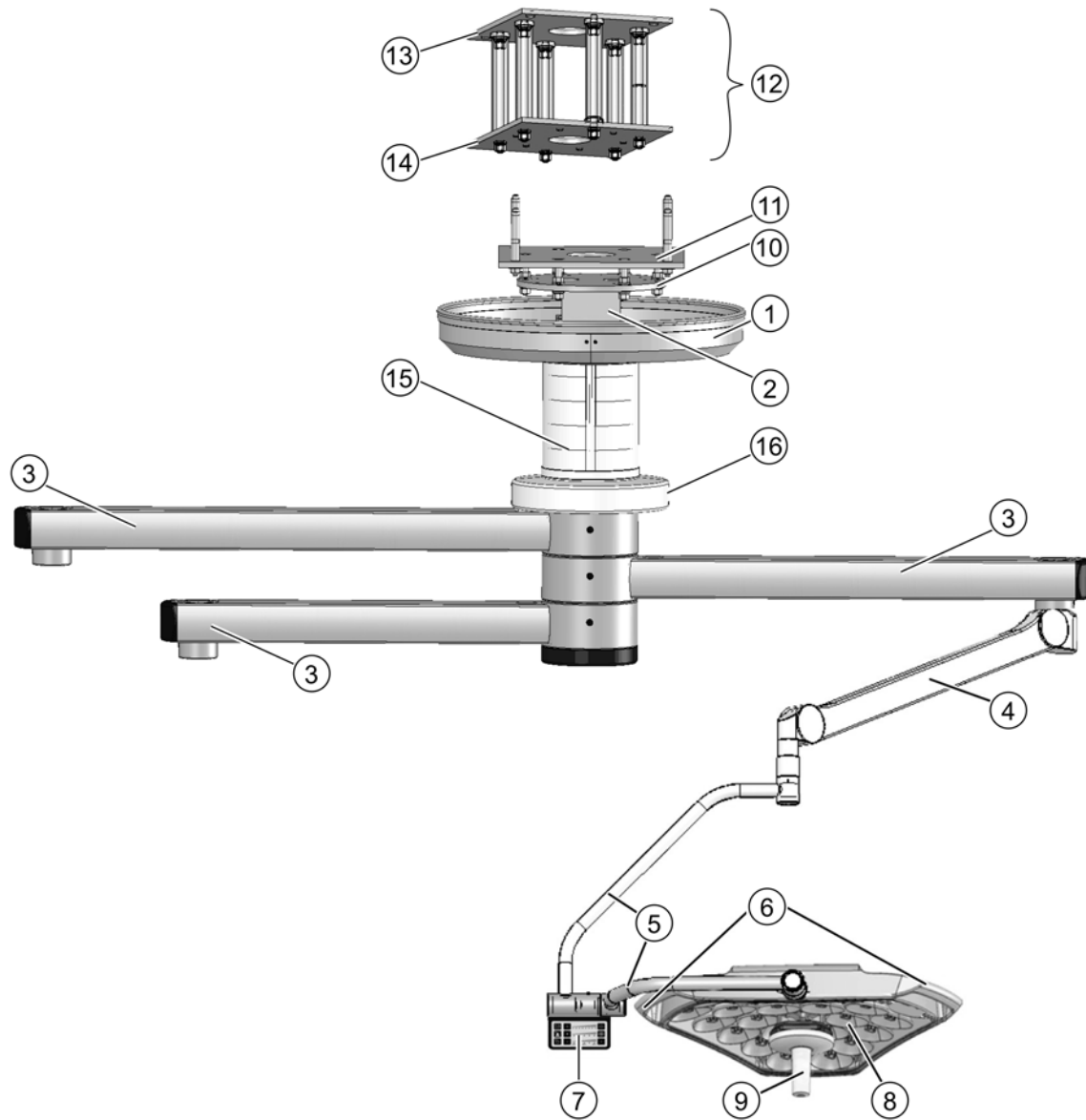
3.1.3 Ceiling variant



- 1 Canopy
- 2 Ceiling tube
- 3 Extension arm (different variants)
- 4 Spring arm
- 5 Cardanic
- 6 Handles
- 7 Light controls

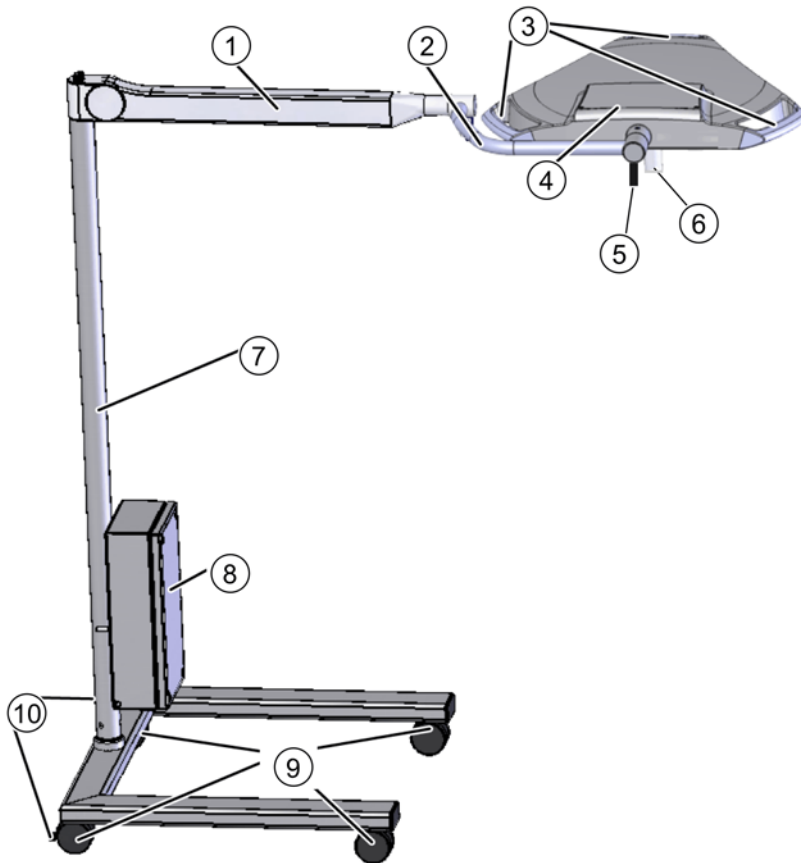
- 8 Light head (here: Sim.LED 5000 MC)
- 9 Sterilisable handle / Sim.CAM
- 10. Ceiling tube flange
- 11 Ceiling anchor plate
- 12 Suspended ceiling fitting (if required)
- 13 Ceiling plate
- 14 Carrier plate

3.1.4 Ceiling variant with Sim.FLEX



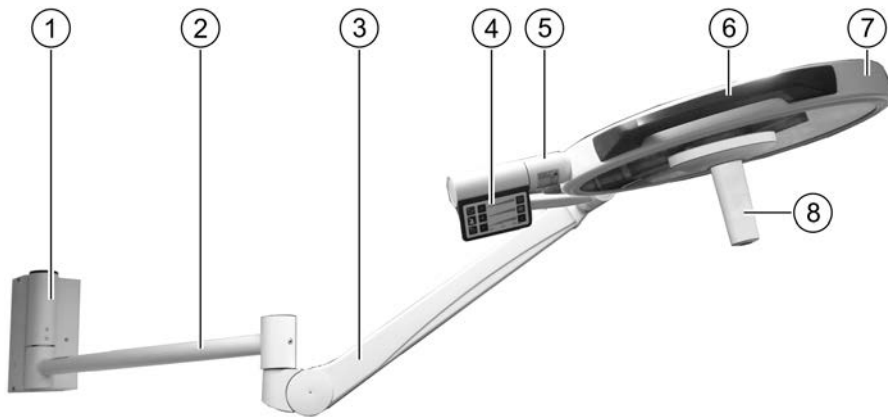
- | | |
|--------------------------------------|--|
| 1 Sim.FLEX canopy | 9 Sterilisable handle / Sim.CAM |
| 2 Sim.FLEX ceiling tube | 10 Ceiling tube flange |
| 3 Sim.FLEX extension arm | 11 Ceiling anchor plate |
| 4 Spring arm | 12 Suspended ceiling fitting (if required) |
| 5 Cardanic | 13 Ceiling plate |
| 6 Handles | 14 Carrier plate |
| 7 Light controls | 15 Sim.FLEX ceiling tube cover |
| 8 Light head (here: Sim.LED 5000 MC) | 16 Sim.FLEX rotating canopy |

3.1.5 Mobile variants (illustration similar)



- | | |
|--|-----------------------|
| 1 Spring arm, straight outlet (illustration similar) | 6 Sterilisable handle |
| 2 Cardanic | 7 Mobile stand |
| 3 Handles | 8 Junction box |
| 4 Light head (Example: Sim.LED 5000 MC) | 9 Casters |
| 5 Light controls | 10. Stop brakes |

3.1.6 Sim.LED 450 wall variant (only available as version with simple cardanic)






- 1 Wall bearing
- 2 Extension arm
- 3 Spring arm, lateral outlet
- 4 Light controls (MC)

- 5 Cardanic
- 6 Handles (non-sterile)
- 7 Light head
- 8 Sterilisable handle

4 Mounting

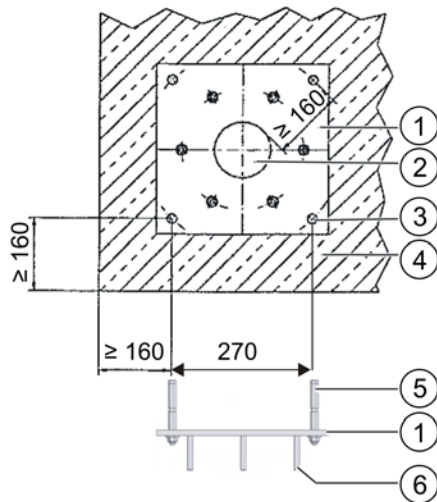
4.1 Ceiling variant

	<p>Risk of injury from failing to follow these Installation Instructions. Installations may only be carried out by trained and authorised qualified personnel.</p> <p>Consumption of alcohol or drugs prior to or during installation are strictly prohibited. The safety, warning and cautionary instructions must be followed!</p>
	<p>Risk of death due to heavy objects!</p> <p>Parts could fall down while the components are being mounted. This could cause severe or even fatal injuries.</p> <ul style="list-style-type: none"> ☞ Never attempt to lift heavy objects by yourself. ☞ If available, use a hoisting platform or a lift. ☞ Mount with at least 2 trained and authorised technicians! ☞ Wear tight-fitting clothing. ☞ Never wear rings, necklaces and other jewellery. ☞ Cover long hair with hairnets.
	<p>Risk of death due to improper fastening of stud bolts! Risk of injury due to reuse of stud bolts!</p> <p>The collapse of the ceiling structure can result in a life-threatening situation. Stud bolts are not suited for multiple uses. Their reuse could thus imperil their bearing capacity and result in injuries to personnel and patients, as well as material damages to the unit.</p> <ul style="list-style-type: none"> ☞ The ceiling must be inspected and approved by a structural engineer prior to installation. ☞ Only use the stud bolts once ☞ Adhere to the specified torque for the stud bolts. ☞ Use only the stud bolts supplied.

4.1.1 Mounting the ceiling anchor plate

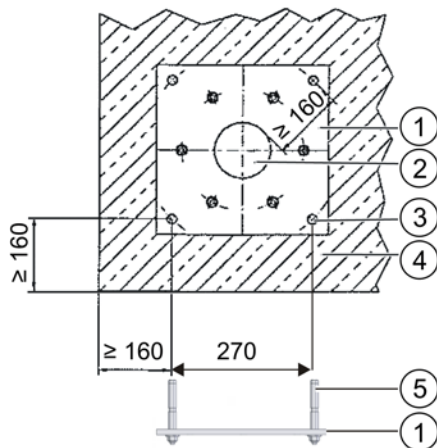
NOTICE

Only mount the ceiling anchor plate on an absolutely horizontal level surface ($< \pm 0.1^\circ$), there may be no offset areas on the ceiling.



- ☞ Have a structural engineer inspect and approve the ceiling, ☞ “Confirmation of static bearing capacity”, page 113. The ceiling must be a flat surface, without any irregularities.
- ☞ Observe the minimum distance to the wall (see illustration).
- ☞ Drill and thoroughly blow out 4 holes (3) in the ceiling (4) for the HSL3G M12 stud bolts (5), in accordance with the attachment bracket manufacturer’s specifications (www.hilti.de).
- ☞ Mount stud bolts (5) accordance with the attachment bracket manufacturer’s specifications.
- ☞ Using stud bolts (5), screw the ceiling anchor plate (1) to the ceiling (4) and tighten each stud bolt with a torque of 60 Nm.

4.1.2 Mounting the suspended ceiling fitting



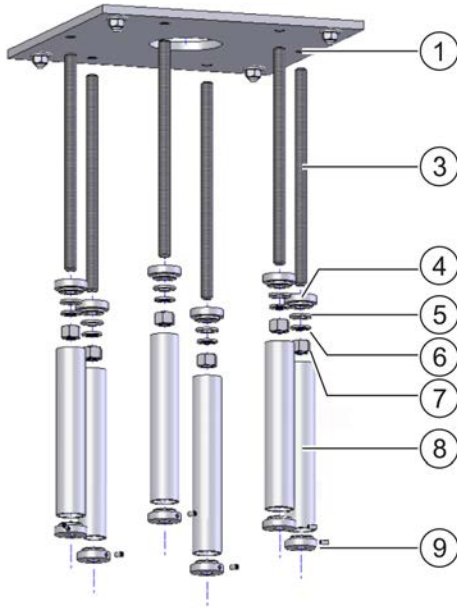
Mounting the ceiling plate

- ☞ Have a structural engineer inspect and approve the ceiling, ☞ “Confirmation of static bearing capacity”, page 113. The ceiling must be a flat surface, without any irregularities.
- ☞ Observe the minimum distance to the wall (see illustration).
- ☞ Drill and thoroughly blow out 4 holes (3) in the ceiling (4) for the HSL3G M12 stud bolts (5), in accordance with the attachment bracket manufacturer’s specifications (www.hilti.de).
- ☞ Mount stud bolts (5) accordance with the attachment bracket manufacturer’s specifications.
- ☞ Using stud bolts (5), screw the ceiling plate (1) to the ceiling (4) and tighten each stud bolt with a torque of 60 Nm.

⚠ WARNING

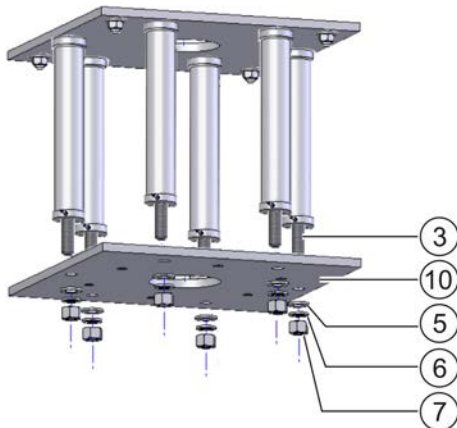
Risk of death due to improper fastening of threaded rods!

If the threaded rods are not screwed in deeply enough into the ceiling plate, the load-bearing capacity of the structure will not be guaranteed and the load-bearing system could collapse! Therefore, always use the entire thickness of the ceiling plate when screwing in the threaded rods!



Mounting the threaded rods for the carrier plate

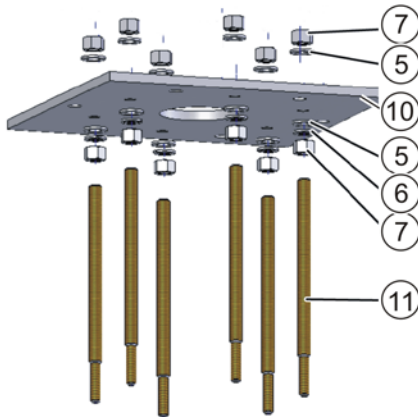
- ☞ Screw in the threaded rods M16 (3) as far as possible into the ceiling plate (1).
- ☞ Slide the piping flange (4) without threaded pin, washer M16 (5) and spring washer M16 (6) onto the threaded rod (3), and fasten with a nut M16 (7).
- ☞ Tighten the nut M16 (7) with 65 Nm.
- ☞ Attach the spacer tube (8).
- ☞ Attach the piping flange (9) and secure against twisting using a threaded pin.
 - ⇒ The spacer tube is thus secured against falling.
- ☞ Mount the remaining threaded rods in the same manner.



Mounting the carrier plate

- ☞ Slide the carrier plate (10) onto the six threaded rods M16 (3) and hold in place.
- ☞ Secure the carrier plate with three nuts (7) to prevent it from falling.
 - ⇒ The carrier plate is thus secured against falling.
- ☞ Slide one washer M16 (5) and one spring washer M16 (6) onto each of the three free threaded rods M16 (3), and secure with a nut M16 (7).
- ☞ Loosen and remove the temporary nuts without washers.
- ☞ Slide one washer M16 (5) and one spring washer M16 (6) onto each of the three remaining threaded rods M16 (3), and secure with a nut M16 (7).
- ☞ Successively tighten all six nuts (7) with 65 Nm.

Mounting



Mounting the threaded rods for the ceiling tube

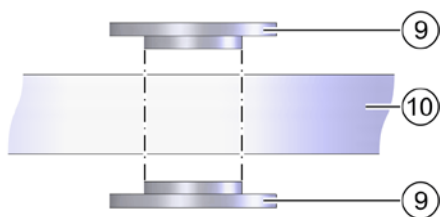
The ceiling tube flange is positioned approximately 200 mm above the intermediate ceiling.

- ☞ Screw the threaded rod M16 (11) through the carrier plate (10) until the beginning of the smaller thread achieves the desired height.
- ☞ Apply a washer M16 (5) to the threaded rod on the top side of the carrier plate and secure with a nut M16 (7).
- ☞ Slide one washer M16 (5) and one spring washer M16 (6) onto the threaded rod (11) on the bottom side of the carrier plate (10), and secure with a nut M16 (7).
- ☞ Mount the remaining threaded rods (11) in the same manner.
- ☞ Tighten the nuts M16 (7) on the bottom side of the carrier plate (10) with 65 Nm; at the same time, tighten the respective nuts M16 (7) on the top.

4.1.3 Mounting the round ceiling tube or Sim.FLEX

The ceiling tube is now mounted onto the threaded rods M12 of the ceiling anchor plate. With an intermediate ceiling construction, the ceiling tube is mounted onto the threaded rods M12 that were screwed into the carrier plate.

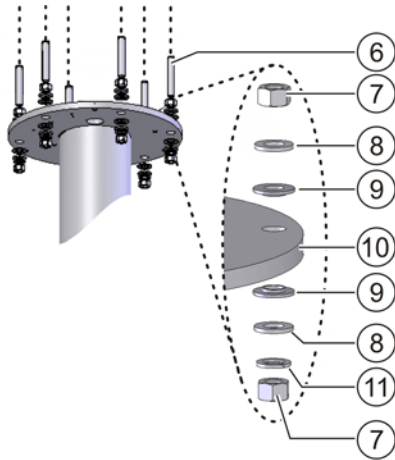
<p>⚠ CAUTION</p>	<p>Danger of injury from falling parts!</p> <p>Since mounting the arms requires overhead work, injuries can be caused by parts falling from above. This is especially the case if not all of an extension arm's six mounting screws are correctly tightened in sequence!</p>
<p>NOTICE</p>	<p>Mount the silicone retaining ring before the extension arms!</p> <p>Before mounting the extension arms, the silicone retaining ring that accommodates the ceiling tube cover must be correctly mounted, ↪ <i>"Mounting the ceiling tube for Sim.FLEX", page 31.</i></p> <p><u>This is no longer possible after mounting the extension arms!</u></p>
<p>NOTICE</p>	<p>If a monitor mount is included in the lighting system, the central axis for the corresponding extension arm is delivered together with a stop piece. When mounting the ceiling tube, it is important to ensure that the range of rotation of this extension arm is as desired. To this end, the ceiling tube can be turned in steps of 60° before mounting. During mounting, the central axis allows additional adjustments of the range of rotation of 120° each, ↪ <i>"Mounting the round central axis", page 33.</i></p>



Mounting the threaded rods for the ceiling tube in insulated form

The threaded rods of the ceiling tube are electrically insulated from the ceiling tube (10) with the help of insulating washers (9). To this end, the insulating washers (9) must be mounted as demonstrated here: Their sleeves are inserted in the holes in the ceiling tube.

Mounting



Mount round ceiling tube

- ☞ Screw a nut (7) onto each of the six threaded rods M12 (6).
- ☞ Align the nuts horizontally using a spirit level.
- ☞ Insert a washer (8) and an insulating washer (9) with the sleeve facing downwards onto each of the six threaded rods M12 (6) and then secure together with the ceiling tube against falling. Here, the sleeves of the insulating washers (9) must slide from above into the holes in the ceiling tube flange without difficulty.
- ☞ Temporarily secure every second threaded rod M12 (6) with a nut M12 (7).

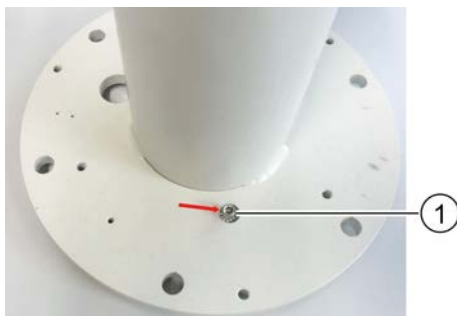
⇒ The ceiling tube (10) is thus secured against falling.

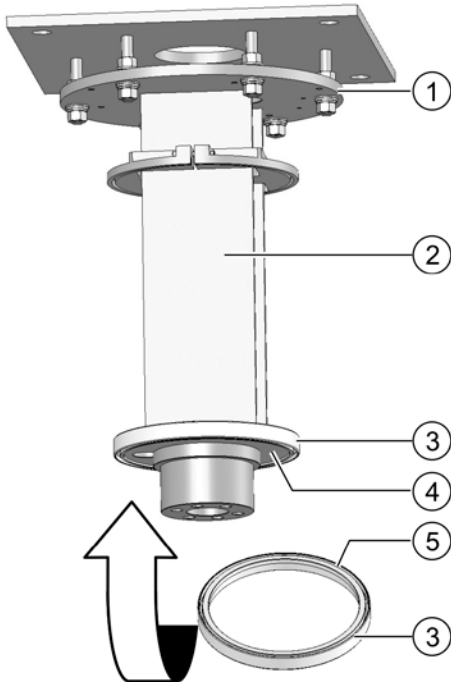
- ☞ Apply one insulating washer (9) with the sleeve facing upwards, one washer (8) and one spring washer (11) onto each of the three free threaded rods, and secure with a nut M12 (7). Here, the sleeves of the insulating washers must slide upwards into the holes in the flange without difficulty.
- ☞ Loosen and remove the temporary nuts without washers.
- ☞ Apply one insulating washer (9) with the sleeve facing upwards, one washer (8) and one spring washer (11) onto each of the three freed threaded rods, and secure with a nut M12 (7). Here, the sleeves of the insulating washers must slide upwards into the flange's boreholes without difficulty.

- ☞ **Check the ceiling tube (10) with the spirit level and realign if necessary.** To do so, readjust the nuts M12 (7) as needed.

- ☞ Alternately tighten the nuts M12 (7) on the bottom side of the ceiling tube (10) crosswise with 45 Nm; at the same time, tighten the respective nuts M12 (7) on the top.

- ☞ **Connect the ceiling tube to the customer-supplied equipotential bonding using the M6 cylinder screw (1) that is supplied for this purpose. Here, use a cable with a cross-section $\geq 6 \text{ mm}^2$. In addition, adhere to the effective regulations for installation in the building (e.g. VDE 0100-710).**





Mounting the ceiling tube for Sim.FLEX

Mount the Sim.FLEX system's ceiling tube flange (1) on the six threaded rods in exactly the same way as described above for the flange of the round ceiling tube Ø 125 mm.

Align the Sim.Flex extension arm vertically on mounting surface using a spirit level.

Slide the silicone retaining ring (3) for the ceiling tube cover onto the flange (4) of the ceiling tube (2) from below, ensuring that the ceiling tube cover's groove (5) points upwards. **This is no longer possible after mounting the extension arms!**

The ceiling tube is now ready to mount the Sim.FLEX extension arms.



The silicone retaining ring (3) seen from above.



The silicone retaining ring (3) seen from below

4.1.4 Fit Sim.FLEX adapter to round ceiling tube

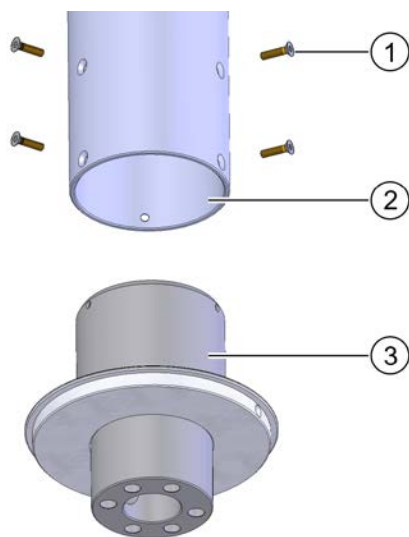
Fit Sim.FLEX adapter to round ceiling tube

The adapter enables the Sim.FLEX system to be mounted on a round ceiling tube.



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above. This is especially the case if not all of an extension arm's six mounting screws are correctly tightened in sequence!



Insert the adapter (3) for the Sim.FLEX system into the round ceiling tube from below, so that its threaded holes are visible through the holes in the ceiling tube for the countersunk screws (1).

Secure the adapter in the ceiling tube using the six socket head countersunk screws (1). Tighten countersunk screws (1) with torque spanner at 7 Nm.

The ceiling tube is now ready to mount the Sim.FLEX extension arms.

The extension arms for the Sim.FLEX system are mounted on the system's ceiling tube one after the other.

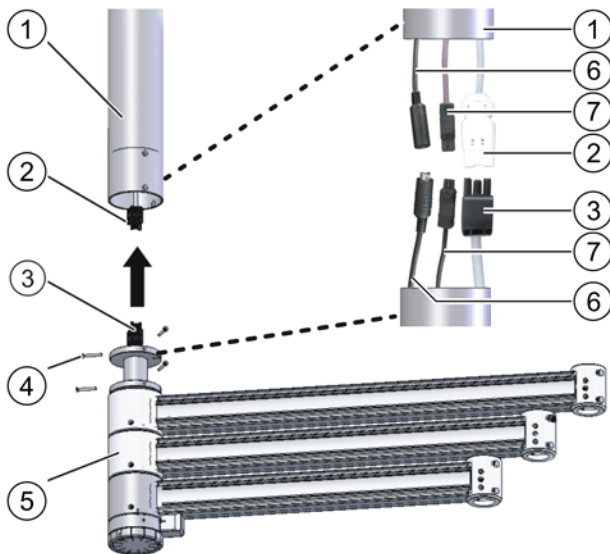
Mounting the extension arm

4.1.5 Mounting the round central axis

CAUTION

Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.



Variant: Power supply unit mounted in the control cabinet, not on the ceiling tube

Power supply: Connect central axis plug (3) to the plug socket (2) of the ceiling tube.

If there are multiple extension arms, the longest cable is for the highest extension arm and the shortest cable is for the lowest extension arm.

If present, connect the purple CAN bus cable (7).

If present, connect the black video signal cable (6).

Variant: Power supply unit mounted onto the ceiling tube

Insert the cable for the central axis upwards through the ceiling tube, and connect it professionally with the power supply unit that is mounted to the ceiling tube and assigned to the respective lights.



If there are multiple extension arms, the longest cable is for the highest extension arm and the shortest cable is for the lowest extension arm.

Both variants

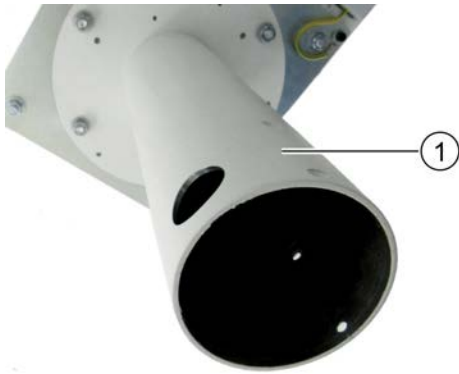
Slide the central shaft (5) into the ceiling tube (1).

Screw in the M6 countersunk screws (4) and, using a spirit level, align the central shaft so that the extension arms are horizontal when extended in every direction.



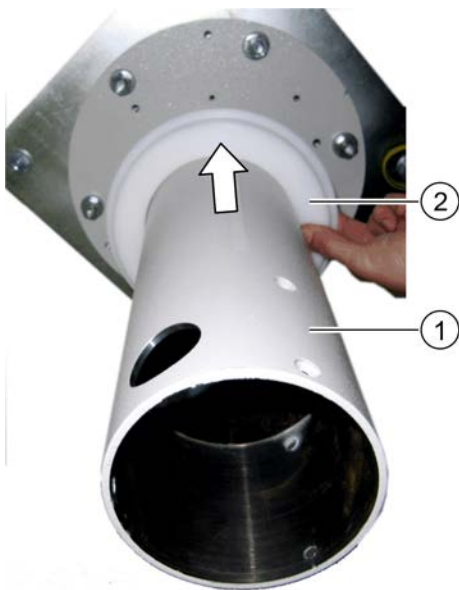
Tighten the M6 countersunk screws (4) by 7 Nm.

Mounting

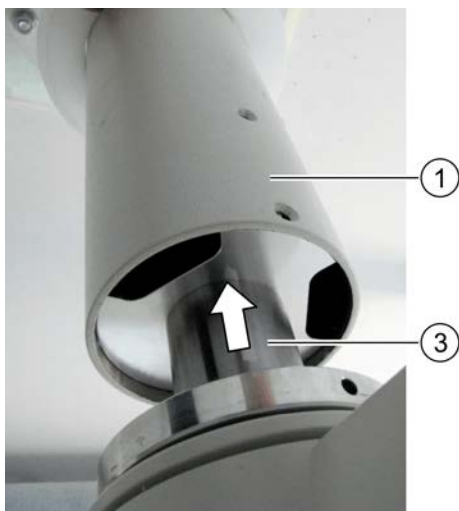


Variant: Ceiling tube for TFT extension arms mounted at the top, and power supply unit mounted to the ceiling tube

Mounting the ceiling tube, *Mounting the round ceiling tube or Sim.FLEX*, page 29.

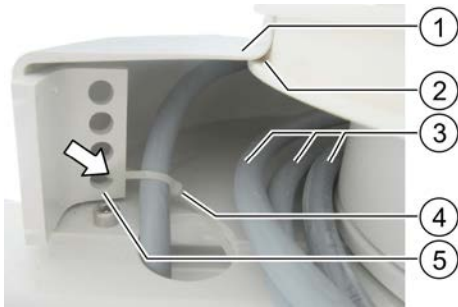


Slide the silicone retaining ring (2) onto the ceiling tube (1) and fasten it to the flange with adhesive tape to prevent it from falling in.



Properly mount the central axis (3),
 Mounting the round central axis, page 33.

PUSHING TECHNOLOGY TO EXCELLENCE



Insert half (1) of the canopy cover into the groove (2) and screw it tight.

Swing the extension arm clockwise until it hits the stop.

Loosely wind the cable around the ceiling tube clockwise in 3 windings (3). Fasten the cables to the perforated strip (5) with cable ties (4).

Note: Choose the cables' direction of rotation so that they cannot be damaged when the extension arm is rotated between the stop position!

Insert the cable for the central axis upwards through the ceiling tube, and connect it professionally with the power supply unit that is mounted to the ceiling tube and assigned to the respective lights.



Remove the adhesive tape from the silicone retaining ring (1) and apply the silicone retaining ring (1) to the canopy (2).



Mount second half of the canopy with the corresponding countersunk screws (3).

4.1.6 Mount Sim.FLEX extension arms

CAUTION

Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above. This is especially the case if not all of an extension arm's six mounting screws are correctly tightened in sequence!

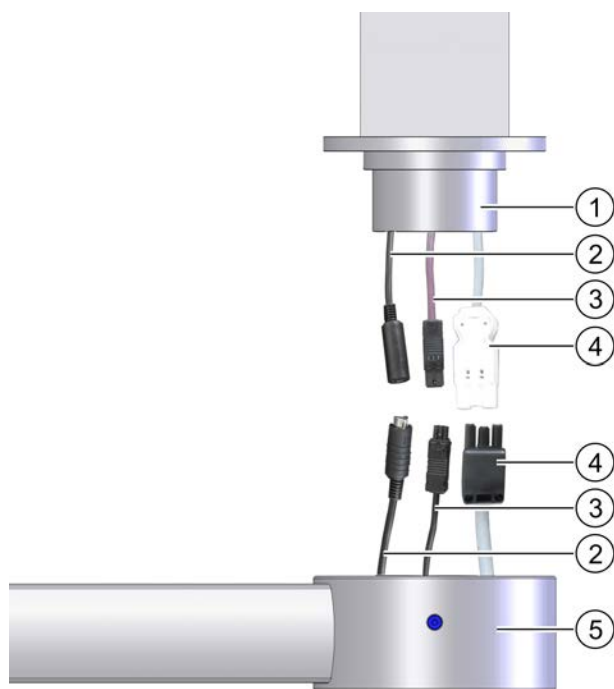
NOTICE

Mount the silicone retaining ring before the extension arms!

Before mounting the extension arms, the silicone retaining ring that accommodates the ceiling tube cover must be correctly mounted, *Mounting the ceiling tube for Sim.FLEX*, page 31.

This is no longer possible after mounting the extension arms!

The extension arms for the Sim.FLEX system are mounted on the system's ceiling tube one after the other. Each extension arm is mounted in the same way:




With the rotating canopy open, position the extension arm (5) below the central shaft (1).

Connect the grey power supply cable (4).

If present, connect the purple CAN bus cable (3).

Connect the black video signal cable (2), if present (Caution: Please observe HD Touch connections)

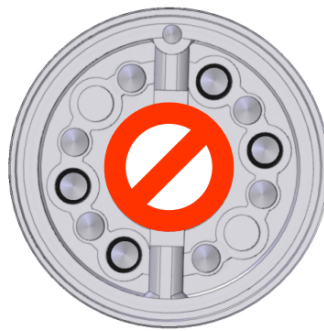
 Connecting the Sim.CAM HD Touch on separate extension arm

NOTICE

Before screwing on the extension arm, ensure that all six M12 screws can be inserted!



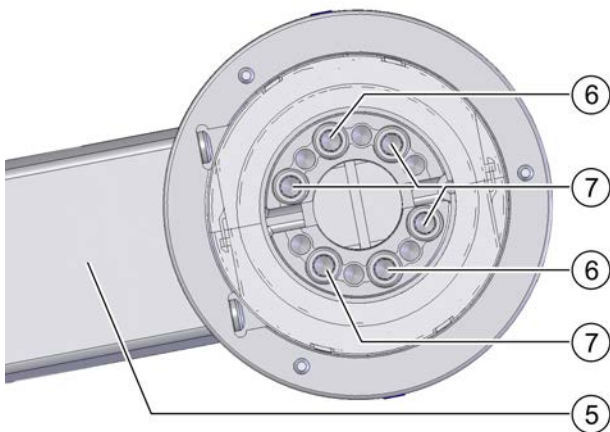
All 6 threaded holes accessible:
Proceed with assembly



Only 4 threaded holes accessible:
Do not proceed with assembly!



Only 2 threaded holes accessible:
Do not proceed with assembly!



Hold the extension arm (5) below the central shaft so that the threaded holes are visible for all six M12 screws (6, 7).

Secure the extension arm using two diametrically opposed M12 screws (6).

Now fit and hand-tighten the remaining M12 screws (7).

Now tighten all six M12 screws (6, 7) using a torque spanner set to 140 Nm.

Mount the remaining extension arms in the same way.

⚠ WARNING

Danger of injury from falling parts!

Errors during assembly can compromise the stability of the lighting system. This can cause the system to collapse, potentially resulting in extremely serious injuries.

Fit and tighten all six M12 mounting screws correctly for each extension arm!

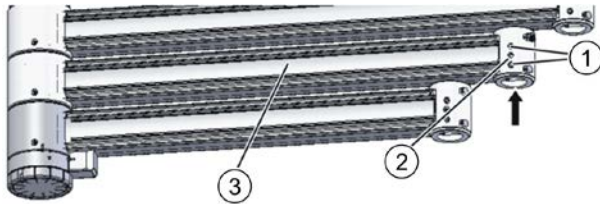
4.1.7 Mounting adapter on spring arm / spring arm on extension arm



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

Supplier variant "Socket mounted on the extension arm"



In this variant, the socket is delivered mounted on the extension arm (3) (see arrow).

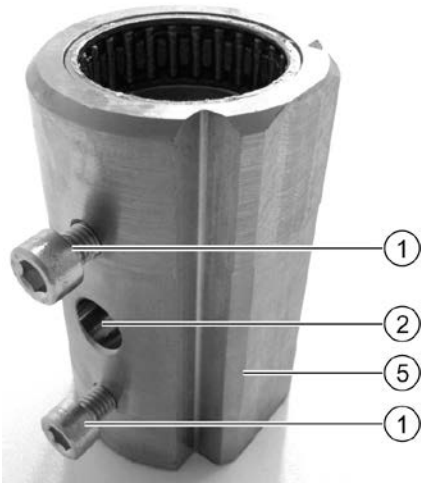
Loosen two cylinder screws M6 (1) from the extension arm (3).

Put your hand under the opening in the socket and secure it to prevent it from falling.

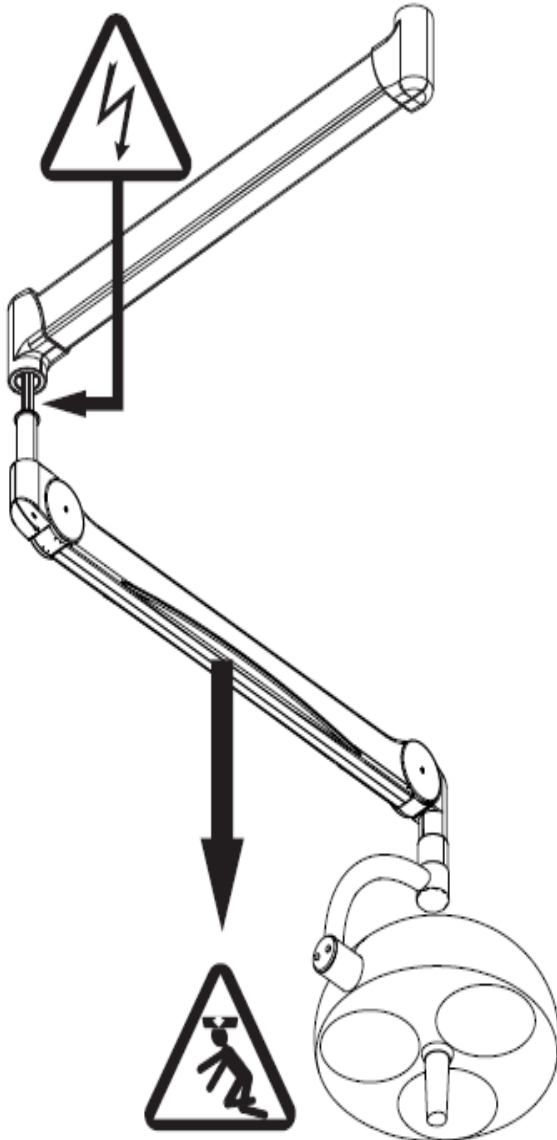
Remove the brake screw (2) from the threaded hole.

Remove the socket (5) downwards from the extension arm and set aside.

Ensure that the needle bearings mounted at the top and bottom of the bushing do not fall out.



⚠ WARNING



Risk of injury due to a collapsing spring arm!

The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!

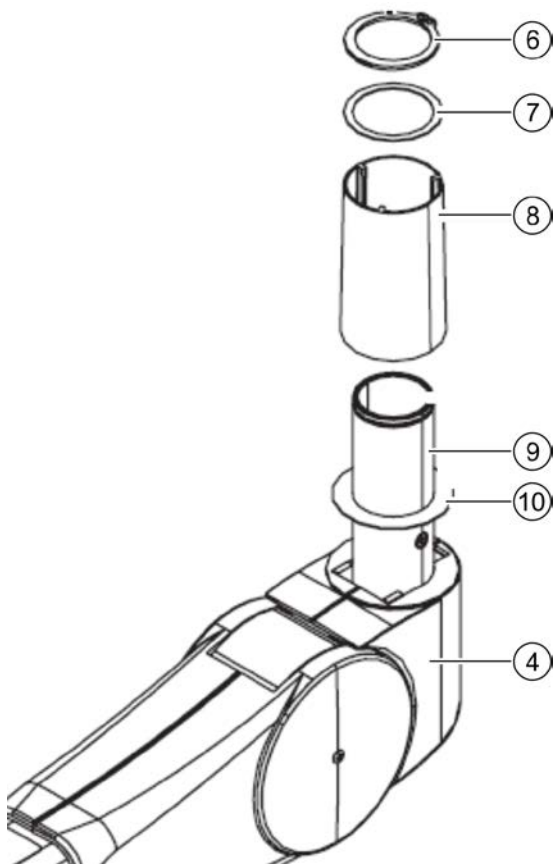
The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!

The spring arm, adapter (e.g. handle) and the end device (e.g. flat screen, surgical lights, etc.) are held in position by a locking ring in the spring arm.

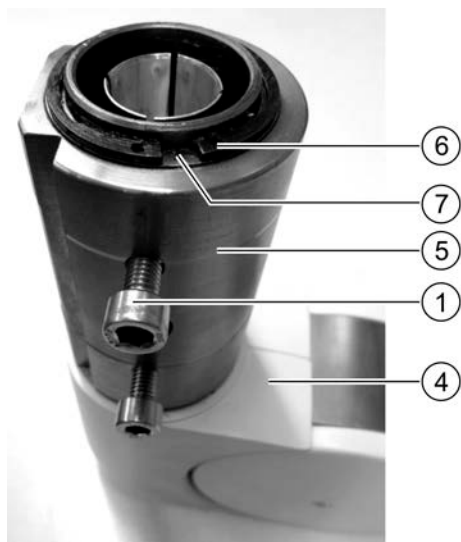
If the locking ring is overexpanded or incorrectly mounted during disassembly or mounting, it will fall out of the groove in the spring arm. As a result, the spring arm, adapter and end device will fall, possibly tearing out internal electrical supply lines. This can cause severe injuries:

- The locking ring may only be installed by trained and authorised qualified personnel.
- Suitable circlip pliers with expansion control must be used.
- The installation instructions and installation order must be complied with.
- Only use the locking ring removed in the initial installation one time, or use a new, unused locking ring.
- In service or maintenance cases, a new, unused locking ring will have to be used.
- Check to make sure the locking ring is seated firmly according to manufacturer specifications!

Mounting



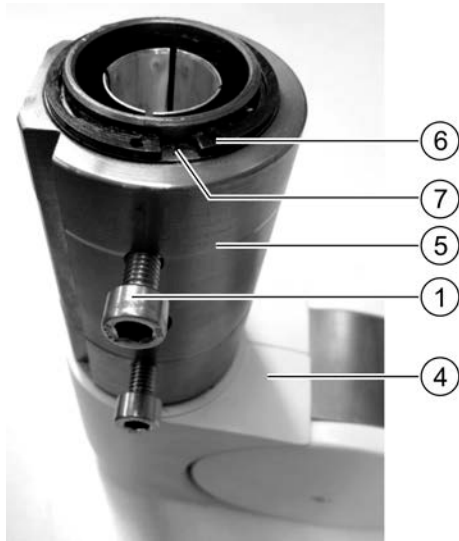
Dismantle locking ring (6), washer (7) and protective sleeve (8) according to manufacturer's assembly instructions.



Insert the sleeve (5) on the pivot (9) of the spring arm (4).

Mount the washers (7) - the pivot groove for the locking ring (6) remains free in the process.

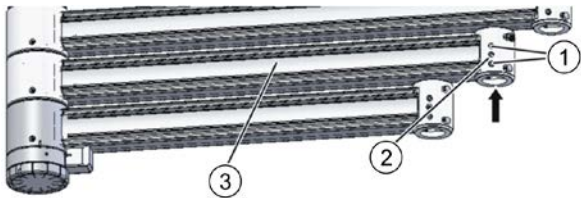
Mount locking ring (6) according to manufacturer's specifications!



☞ Identify the spring arm by the product label (3 pol./5 pol./9 pol./TFT) and allocate the corresponding spring arm of the central axis or Sim.Flex to the installation. **Incorrect allocation may damage the central axis and spring arm!**

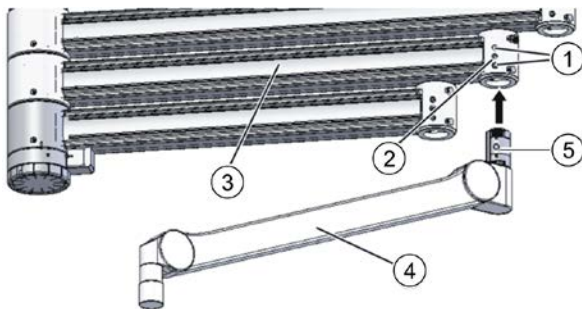
☞ Precisely align the spring arm with sleeve (5) horizontally and vertically and insert into the extension arm as far it will go so that the threaded holes for the cylinder screws (1) are aligned with the boreholes in the extension arm.

☞ Fasten the spring arm with the cylinder screws M6 (1) and tighten with torque spanner at 8 Nm.



☞ Insert and tighten the brake screw (2) for the spring arm ↪ "Setting the braking power", page 112.

Supply variant "Socket pre-mounted on the spring arm"



☞ Remove the brake screw (2) from the end of the extension arm.

☞ Place the spring arm pivot with sleeve (5) in the extension arm (3) in such a manner, that the threaded holes are aligned with the holes (1) in the extension arm.

☞ Tighten the spring arm using the cylinder screws M6 in the holes (1).

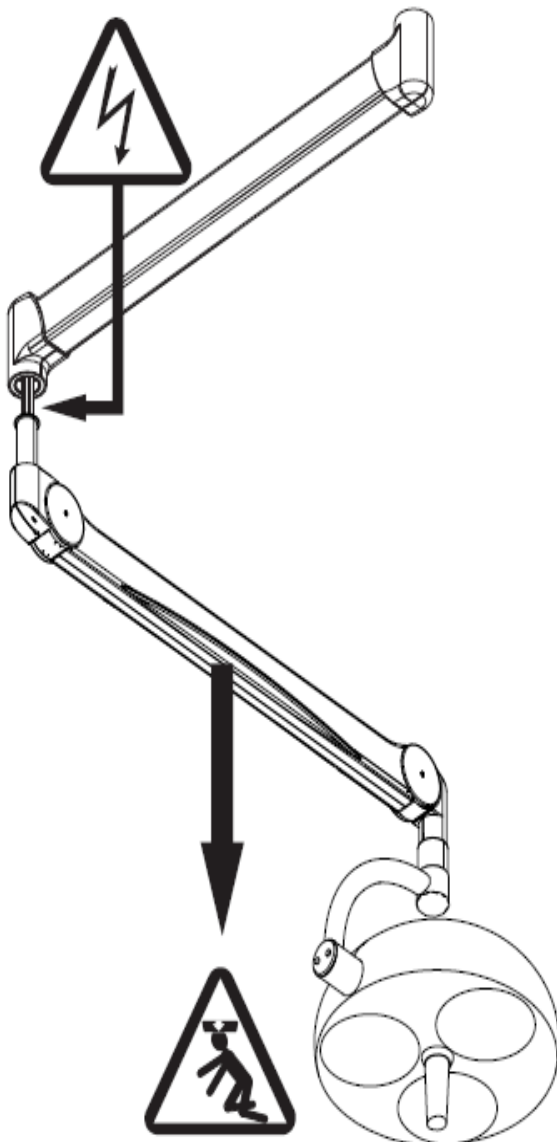
☞ Insert and tighten the brake screw (2) for the spring arm ↪ "Setting the braking power", page 112.

4.1.8 Mounting adapter on spring arm / mounting spring arm on Sim.FLEX extension arm



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.



Risk of injury due to a collapsing spring arm!

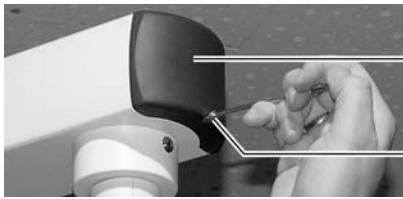
The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!

The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!

The spring arm, adaption (e.g. handle) and the end device (e.g. flat screen, surgical lights, etc.) are held in position by a locking ring in the spring arm.

If the locking ring is overexpanded or incorrectly mounted during disassembly or mounting, it will fall out of the groove in the spring arm. As a result, the spring arm, adaption and end device will fall, possibly tearing out internal electrical supply lines. This can cause severe injuries:

- The locking ring may only be installed by trained and authorised qualified personnel.
- Suitable circlip pliers with expansion control must be used.
- The installation instructions and installation order must be complied with.
- Only use the locking ring removed in the initial installation one time, or use a new, unused locking ring.
- In service or maintenance cases, a new, unused locking ring will have to be used.
- Check to make sure the locking ring is seated firmly according to manufacturer specifications!



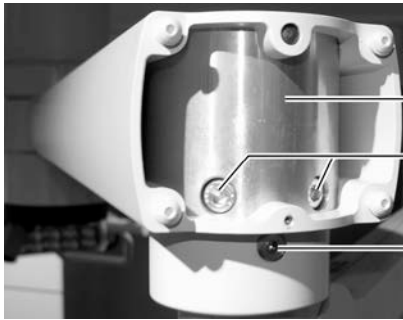
①

The extension arm is supplied with the bushing already fitted.

☞ Use a hexagon spanner to remove the retaining screw (2) from the extension arm cap (1).

②

☞ Lay the cap and screw to one side.



③

☞ Undo two M8 cylinder screws (4) from the socket (3).

☞ Put your hand under the opening in the socket and secure it to prevent it from falling.

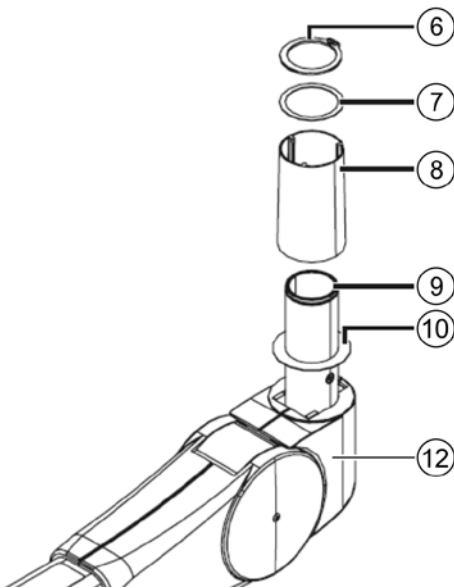
④

☞ Remove the brake screw (5) from the threaded hole.

⑤

☞ Remove the socket (3) downwards from the extension arm and set aside.

Ensure that the needle bearings mounted at the top and bottom of the socket (3) do not fall out.



⑥

☞ Dismantle locking ring (6), washer (7) and protective sleeve (8) according to manufacturer's assembly instructions.

⑦

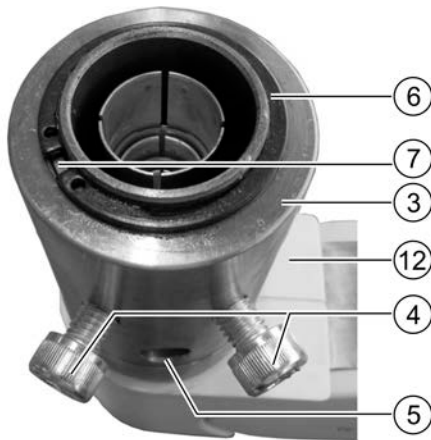
⑧

⑨

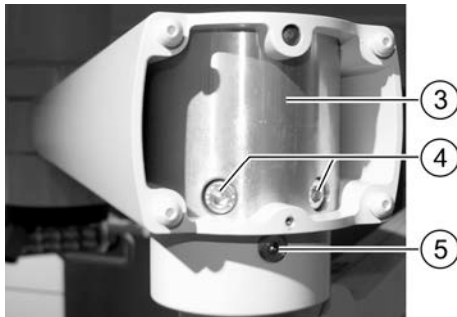
⑩

⑫

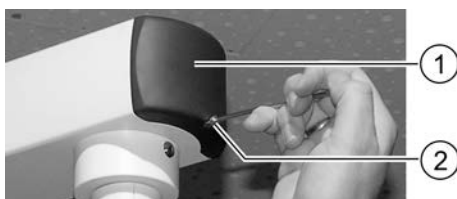
Mounting



- ☞ Insert the sleeve (5) on the pivot of the spring arm (12).
- ☞ Mount the washers (7) - the pivot groove for the locking ring (6) remains free in the process.
- ☞ Mount locking ring (6) according to manufacturer's specifications!



- ☞ **Identify the spring arm by the product label (3 pol./5 pol./9 pol./TFT) and allocate the corresponding Sim.Flex spring arm to the installation. Incorrect allocation may damage the slip ring, Sim.Flex extension arm and spring arm.**
- ☞ Precisely align the spring arm with sleeve (5) horizontally and vertically and insert into the extension arm as far it will go so that the threaded holes for the M8 cylinder screws (4) are aligned with the boreholes in the extension arm.
- ☞ Tighten the spring arm using the M8 cylinder screws (4) in the extension arm, using a torque spanner set to 20 Nm.
- ☞ Insert and tighten the brake screw (5) for the spring arm
☞ *“Setting the braking power”, page 112.*



- ☞ Replace the cap (1).
- ☞ Insert the retaining screw (2) into the extension arm cap (1) and use a hexagon spanner to tighten gently.

4.1.9 Mounting spring arm adapter (optional delivery variant)

⚠ WARNING

Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.



The sleeve is installed in the adapter upon delivery.

- ☞ Identify the adapter by the product label (3 pol./5 pol./9 pol./TFT) and allocate the corresponding spring arm of the central axis or Sim.Flex to the installation. The adapter can be installed with normal central axes as well as the Sim.Flex extension arm. Incorrect allocation may damage the adapter, central axis/Sim.Flex and spring arm.
- ☞ Remove the sleeve installed in the bottom side of the adapter. To do so, remove the mounting screws (marked blue) and brake screws (marked blue). The 2nd brake screw is offset by 180° on the back side. Do not turn the red marked screws!



- ☞ Carefully remove the sleeve installed in the adapter bottom side in the axial direction without using tools. In doing so, make sure not to touch or damage the inner slip ring!

Mounting



- ☞ Align the adapter so that it is absolutely horizontal and vertical and carefully insert it into the extension arm as far as it will go.



- ☞ With a normal central axis, screw in the M6 screws and tighten at 8 Nm with a torque spanner.
- ☞ **Sim.Flex variant:**
Screw in the M8 screws and tighten at 14 Nm with a torque spanner.
- ☞ Screw brake screw in flush accordingly.

Mount sleeve on spring arm according to page 37 and/or 42

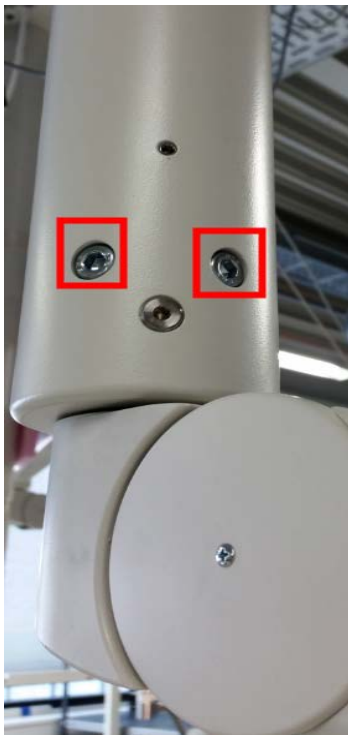


Risk of injury due to a collapsing spring arm!

The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!



- ☞ Align the spring arm with mounted sleeve so that it is absolutely horizontal and vertical and correctly positioned based on the holes and carefully insert into the adapter as far as it will go.



- ☞ Screw in the M8 screws and tighten at 20 Nm with a torque spanner.
- ☞ Screw brake screws in on the front and back side and set brake force as needed. Turn the brake screw in a clockwise direction, using the Allen key, to increase the braking power. Turn the brake screw counterclockwise to decrease it.

⚠ WARNING

Risk of injury due to incorrect mounting!

Incorrect or unsafe mounting of the assembled device may lead to life-threatening situations and cause significant material damage. Thus, please note:

- The adapters are not meant to be attached to one another; instead, only one is to be attached to each central axis extension arm.

Mounting

4.1.10 Mounting the light heads onto the spring arm



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

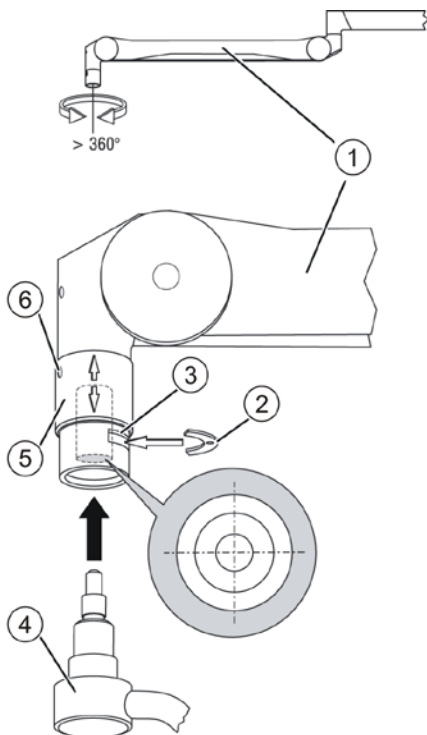
The safety sleeve must be attached and screwed tightly!



Note: When placing the pivot in the spring arm, ensure that the turning connector (5) is not damaged!

☞ For this purpose, remove the turning connector's protective cap only shortly before insertion, and carefully align the pin parallel to the LC spring arm.

A damaged turning connector cannot be used and must be disposed of.



- ☞ Bring the spring arm (1) into position.
- ☞ Loosen and remove the sleeve's retaining screw (6).
- ☞ Slide the safety sleeve (5) upwards and affix.
- ☞ Remove safety piece (2).
- ☞ Insert the cardanic's (4) pins carefully and vertically into the spring arm (1), until the pin's groove can be located in the safety piece's opening (3).
- ☞ Insert the safety piece (2) and slide the safety sleeve (5) downwards.
- ☞ Screw tightly the sleeve's retaining screw (6).
- ⇒ The light head is safely connected to the spring arm (1).

4.1.11 Mounting and connecting the power supply unit for surgical lights to the ceiling tube

⚠ WARNING



Danger of electric shock!

A switch is to be provided on-site as a disconnecter from the mains power supply which disconnects the system from the mains power supply at all poles simultaneously. This switch must meet the creepage and air distance requirements set forth in IEC 61058-1 for a mains voltage peak of 4 kV. The activation device for this switch must meet the requirements of IEC 60447.

If the switch is not visible to the maintenance personnel, it will have to be possible to lock it in the OFF position.

The locking mechanism may be located in the mains power supply switch of the organisation in charge.



- ① The sample image shows a switching power supply mounted on a ceiling tube. The switching power supply can also be mounted externally in a control cabinet.

☞ **Switch off the building's power supply and safeguard against restarting!**

- ☞ Screw in the power supply unit (2) using 2 screws M8 (3), with spring washer and washer on the threaded holes intended for this purpose, to the ceiling tube's (1) flange.

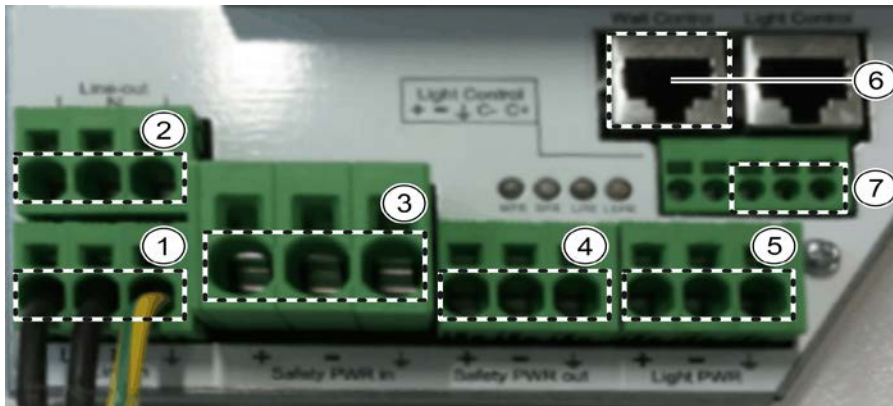
⚠ WARNING

Applied voltage may damage or destroy the components to be installed!

Disconnect the on-site power supply from the mains and secure it to prevent reconnection when

conducting any installation work!

Mounting



- | | |
|---|--|
| 1 Line in 100 – 240 V AC (L, N, PE) | 5 Connection to lights 28V DC (+, -, PE) |
| 2 Line out 100 – 240 V AC (L, N, PE) | 6 Connection to the wall control unit |
| 3 Safety Power in 28 V DC+1% -8% (+, -, PE) | 7 CAN connection to the lights (PE CAN+, CAN-) |
| 4 Safety Power out 28 V DC +1% -8% (+, -, PE) | |

☞ Connect a Ø 2.5mm² cable to **Line in** (1) of the on-site power supply:

☞ **Caution: “Safety Power in” is not controlled. High voltages outside of the tolerance will lead to defects or destroy the connected devices!**

Line in	L	Phase
Line out	N	Neutral conductor
	PE	Grounding conductor

Approved cable lengths for 28V DC direct-current voltage from power supply to central axis (max. voltage drop 5%):

Ambient temperature for approved cable lengths: max. 50° Celsius

Maximum power: 130 watts

Cable length:

≤ 18 metres

> 18 metres and ≤ 30 metres

> 30 metres and ≤ 45 metres

Cable cross-section:

2.5mm²

4.0mm²

6.0mm²

⚠ CAUTION

Risk of injury due to light/camera malfunction!

In order to safeguard against the possibility of a lighting system outage, every switching power supply on site must be powered by a separate feed line!

Each light must be supplied with a separate switching power supply.

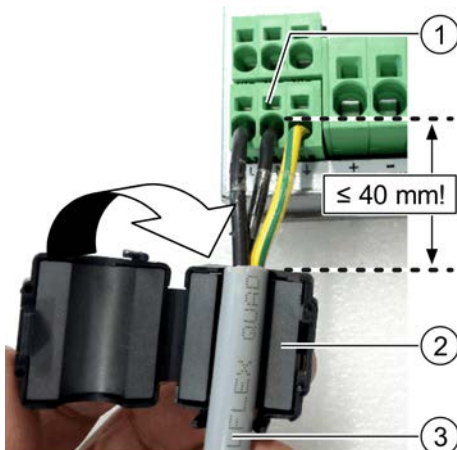
Each camera on a separate arm must be supplied with a separate switching power supply.

The **Line out** outputs (2) are only used to supply an optional, medically approved display (with 100 – 240V AC, if possessing country- / region-specific approval).

⚠ CAUTION

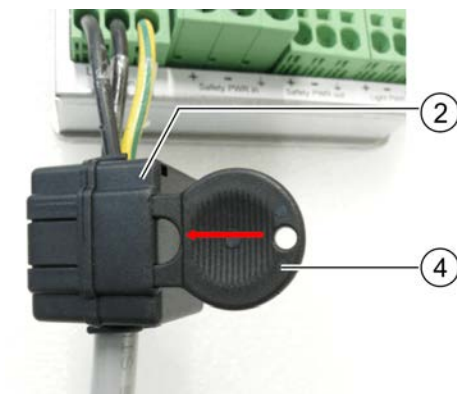
Risk of injury due to voltage fluctuations!

The mains power supply must satisfy overvoltage category II in terms of the mains transients. Voltages above 110 % or below 90 % of the voltage's nominal value may not arise between arbitrary conductors of the system or between one of these conductors and earth. The client must also offer Simeon products protection against excessively high start-up currents.



☞ Next, affix the ferrite core (2) to the **Line in** (1) mains supply line. To do so, place the ferrite core around the cable and allow the ferrite core's snap lock to snap into place. If the cable is not securely clamped by the ferrite core, secure the ferrite core in position (3) against sliding using a cable tie.

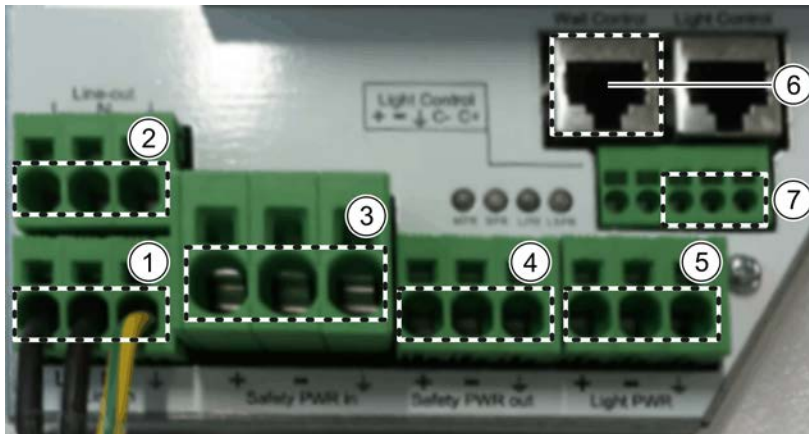
☞ Make sure that the ferrite core is not mounted at a distance greater than 40 mm from the terminal (1).



☞ The ferrite core (2) can be dismantled and readjusted using a specific key (4).

Mounting

Function test



- | | |
|---|--|
| 1 Line in 100 – 240 V AC (L, N, PE) | 5 Connection to lights 28V DC (+, -, PE) |
| 2 Line out 100 – 240 V (L, N, PE) | 6 Connection to the wall control unit |
| 3 Safety Power in 24 – 28 V DC +1% -8% (+, -, PE) | 7 CAN connection to the lights (PE CAN+, CAN-) |
| 4 Safety Power out 24 – 28 V DC +1% -8% (+, -, PE) | |

- ☞ Switch on-site power supply on and check whether the LED **MPR** above the **Safety Power out** (4) lights up.
 - If it does not, then check whether the on-site power supply is correctly connected to the **Line in** (1).
 - If it is, then use a voltmeter to check at **Line in** (1) whether the on-site power supply is correctly connected.
 - If this is the case, then the power supply is defective.
- ☞ Switch off the building's power supply and safeguard against restarting.
- ☞ If necessary, replace the power supply and repeat the function test.

After a successful function check, switch off the building's power supply and safeguard against restarting!

Without voltage on power supply

- ☞ Connect 3-wire cable (colour: grey) from the central axis to the lighting supply to **Light Power** (5) (+, -, PE):

+	Lighting supply + 28 VDC, "1", SW
-	Lighting supply - 2", SW
PE	Lighting supply grounding conductor GNYE

The black wires of the lighting voltage + and - are stamped with "1" and "2."

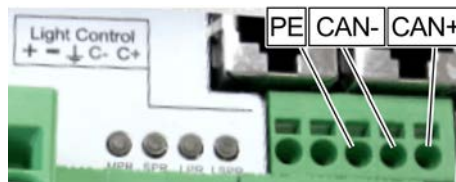
- ☞ Optional: Connect existing emergency power supply to **Safety Power in** (3).

+	Input + 24 – VDC
-	Input - (0 V)
PE	Grounding conductor

If **Safety Power in** (3) is not supplied with power, **Safety Power out** (4) will also have no power.

- ☞ Connect the purple cable from the central axis to the terminal block (7) for CAN communication with the light:



Brown: CAN+
 White: CAN-
 Black: Grounding shield



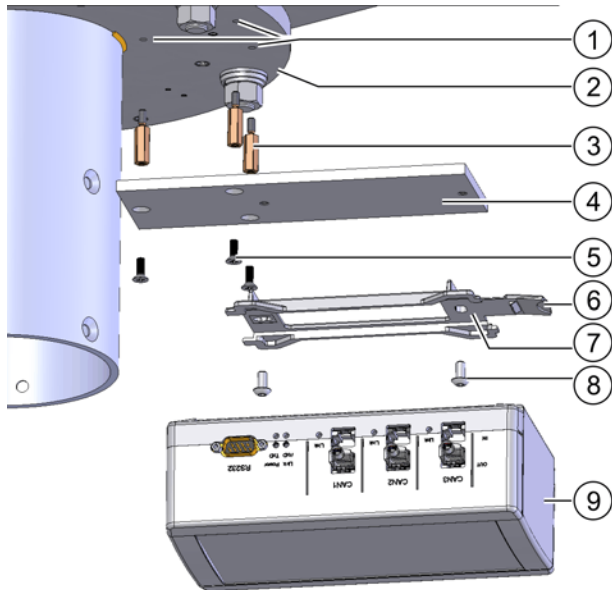
- ☞ Connect the RJ45 patch cable from the wall control unit to **Wall Control** (6) for communication with the wall control unit.

4.1.12 Installing the Sim.INTERFACE

The Sim.INTERFACE requires 1 installation place on the ceiling tube.

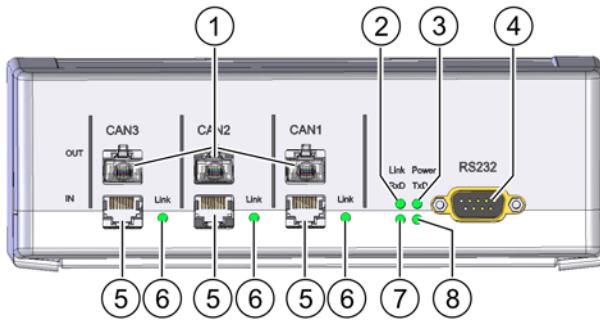
	<p>Danger of injury from falling parts!</p> <p>Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.</p> <p>The safety sleeve must be attached and screwed tightly!</p>
	<p>Danger of electric shock!</p> <p>The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.</p>

Mounting



- ☞ Screw the three M4 x 20 mm spacer bolts (3) into the threaded holes (1) in the ceiling tube flange (2).
- ☞ Screw the retainer (4) onto the spacer bolts (3) with the three countersunk head screw M4 x 15 mm (5).
- ☞ Screw the Sim.INTERFACE wall bracket (7) to the retainer (4) with the two Allen screws (8).
- ☞ Slide the Sim.INTERFACE (9) onto the wall bracket (7) until it snaps into place.
- ☞ In order to release the snap connection, push up on the lever (6) slightly until the Sim.INTERFACE (9) can be slid out.

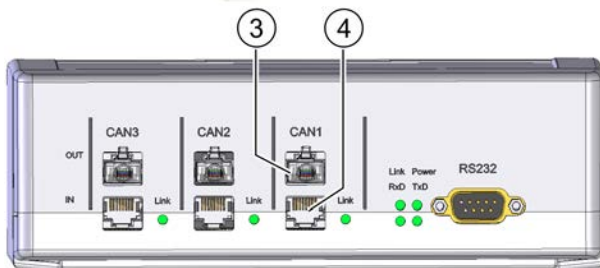
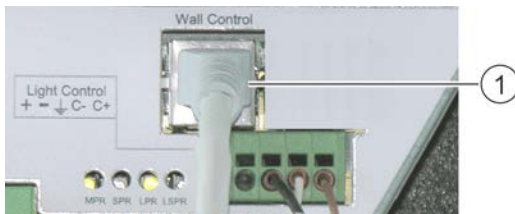
4.1.13 Connecting the Sim.INTERFACE



Connections of the Sim.INTERFACE

- | | | |
|---|-----|--|
| 1 | OUT | outputs (wall control units) CAN1 to CAN3 |
| 2 | | LED display RS232 Link (link status) |
| 3 | | LED display Power |
| 4 | | Connection RS232 |
| 5 | IN | inputs (power supplies for lights) CAN1 to 3 |
| 6 | | LED displays for link status CAN1 to 3 |
| 7 | | LED display RS232 Rx/D |
| 8 | | LED display RS232 Tx/D |

Power supply and wall controls are connected to the CAN1, CAN2 or CAN3 of the Sim.INTERFACE by one connection cable each. The interface is connected to an interface card such as OR1 with its RS232 interface (4) in an integrated OR. This integrated OR is then used to control the surgical lights and cameras.



Connecting the Sim.INTERFACE

- ☞ Plug the patch cable (2) on the power supply into the RJ45 socket **Wall Control** (1).
- ☞ Plug the patch cable (2) on Sim.INTERFACE into the RJ45 socket **CAN1 In** (4). Make sure that the correct CAN connection is assigned to CAN1! CAN2 and CAN3 are intended for additional lights.
- ☞ Plug the patch cable for wall control of light 1 on Sim.INTERFACE into the RJ45 socket **CAN1 Out** (3). CAN2 and CAN3 are intended for additional lights.
- ☞ If a wall control is not present, close the slot with a dummy plug and only plug in the cable for the light.
- ☞ Connect the OR server at the RS232 slot.

If further surgical lights are connected, repeat the steps described above. The connection lines must be plugged into CAN2 and/or CAN3 at the Sim.INTERFACE.

4.1.14 Mounting the wall controls

⚠ WARNING

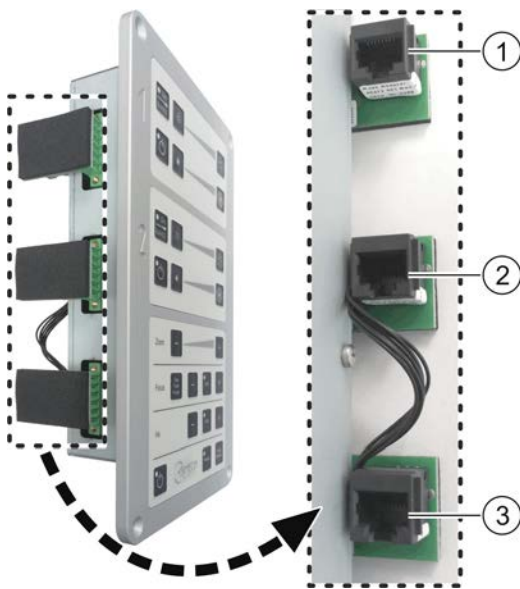


Danger of electric shock!

The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.

NOTICE

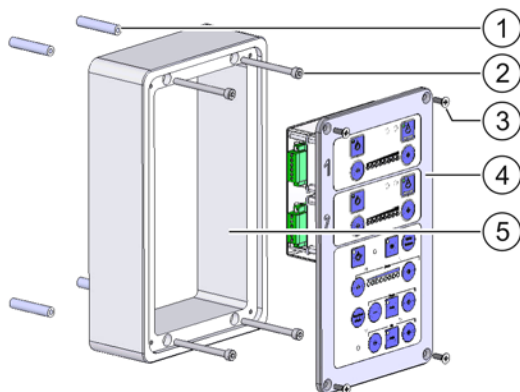
If the wall controls are configured for multiple lights, the camera must be positioned on light 2; otherwise, camera control will not be possible!



One power supply will be needed for each light head. In this example, 2 of them are connected to the wall controls.

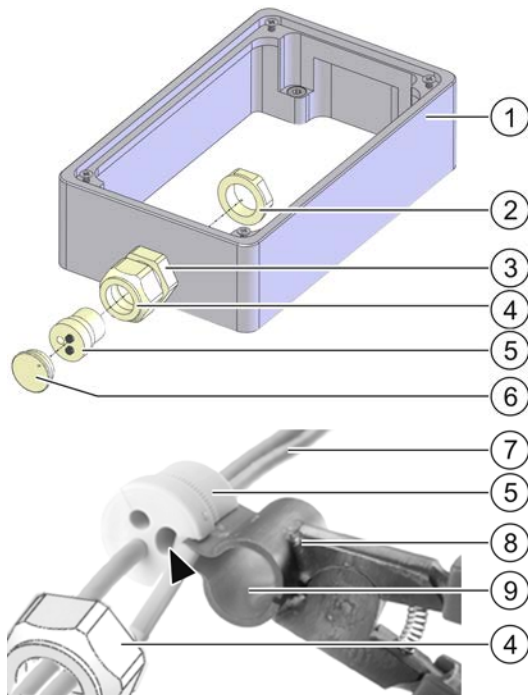
- ☞ Disconnect the on-site supply line from the mains and safeguard against reconnection.
- ☞ Observe the minimum installation depth of 60 mm!
- ☞ Ensure that the supply line remains disconnected from the mains until the wall controls have been mounted.
- ☞ Pull the patch cable from the Sim.INTERFACE and/or from power supply of light 1 at the wall controls' installation point and plug into the RJ45 socket (1) of the light.

Note: If more than one light is connected, then plug the patch cable of the other lights into their RJ45 sockets (2). The CAN connection which is not allocated to any light (3) remains empty.



Surface mounting

- ☞ Fasten the housing (5, illustration similar) to the base with four screws (2) and, if necessary, distance sleeves (1) so that the connection cables (RJ45) end in the housing. Borehole spacing: 80 x 210 mm
- ☞ Connect connection cables to the correct RJ45 socket; see above.
- ☞ Fasten the wall control unit (4) to the housing with four countersunk screws (3).



If the cables are run to the housing externally, they can be run to the housing through the cable feedthrough (3):

- ☞ Unscrew the nut (4) and remove the cover (6).
- ☞ Tighten counter nut (3).
- ☞ Place nut (4) back on.
- ☞ First, run the cable with the RJ45 plugs into the housing (1) without strain relief (5).
- ☞ Unscrew nut (4) of cable feedthrough (3) and slide it a bit away from the housing (1) on the cable.
- ☞ Open pliers (8).
- ☞ Insert cable (7) between nut (4) and cable feedthrough (3) into the large opening (9) in the pliers (8).
- ☞ Close pliers (8) and plug their tip into the feedthrough intended for the cable (see arrow).
- ☞ Open pliers (8) wide enough for the cable to be pushed into the feedthrough of the strain relief (5).
- ☞ Push cable into the feedthrough of the strain relief (5), see arrow.
- ☞ Slide strain relief (5) on the cable into the cable feedthrough (3).
- ☞ Guide nut (4) back and tighten it until the strain relief is active.

4.1.15 Mounting canopy to ceiling tube



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

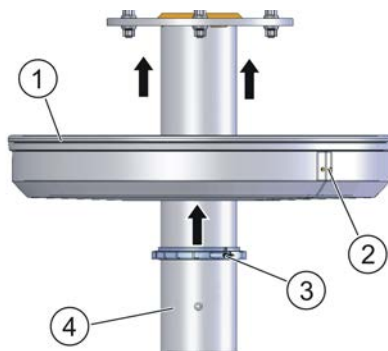
- ☞ Wear a protective helmet.
- ☞ Wear safety boots.



Risk of injury due to pinching!

Multiple parts must be assembled together or mounted onto one another. As a result, injuries may occur due to pinching.

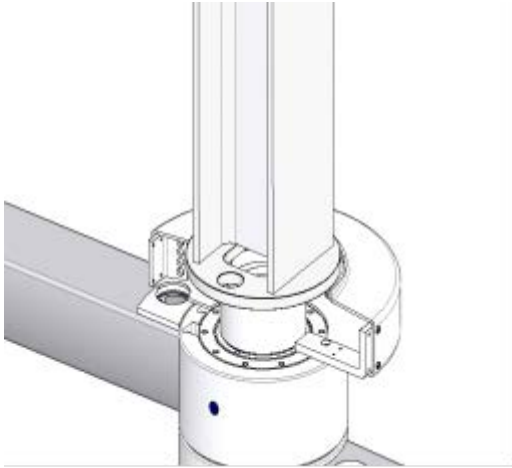
- ☞ Proceed cautiously during assembly.
- ☞ Wear safety boots



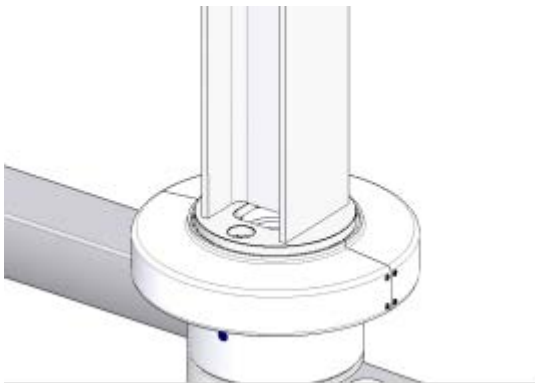
The figure shows the canopy on a round ceiling tube. The Sim.FLEX system's canopy has a larger central aperture of 200 mm and is mounted onto the ceiling tube cover.

- ☞ Attach retaining ring (3) to ceiling tube (4).
- ☞ Mount the two half-shells of the canopy (2).
- ☞ Attach silicone seal (1).
- ☞ Slide canopy upwards and fasten it with retaining ring (3) (Torx TX20).

4.1.16 Mount rotating canopy to Sim.Flex extension arm and normal central axis



- ☞ Secure on the first half-shell of the rotating canopy with two Allen screws.
- ☞ Insert the cable for the central axis upwards through the ceiling tube, and connect it professionally with the power supply unit that is mounted to the ceiling tube and assigned to the respective lights.
- ☞ Place the cable around the ceiling tube in three windings to ensure enough reserve cabling for the extension arm's rotational range. Choose the cables' direction of rotation so that they cannot be damaged when the extension arm is rotated between the stop position!



- ☞ Secure the rotating canopy's second half-shell (7) to the bracket and the first half-shell, using two Phillips head screws (6) in each case.

4.1.17 Mounting the Sim.FLEX ceiling tube cover

WARNING

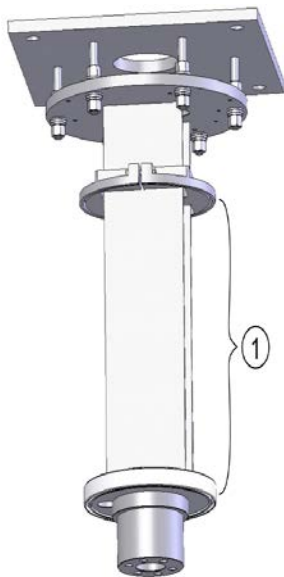


Risk of fatal cutting and pinching injuries!

Skin and body parts could be pinched during mounting of the components. This could cause anything from cutting injuries to death.

Mount with at least 2 trained and authorised technicians!

Wear safety boots



Mounting the Sim.FLEX ceiling tube cover

Measure the distance (1) between the holding flange (top) and the silicone retaining ring (below).

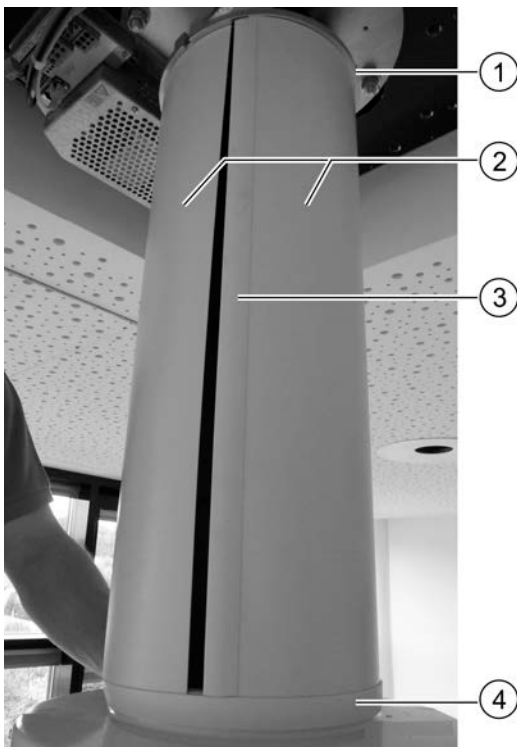


Cut the appropriate segment for the ceiling tube cover in such a manner that the end reaches inside the canopy.

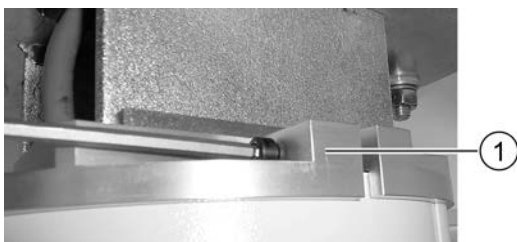
Accurately cut the 2 halves of the ceiling tube cover against this segment.



- ✎ Cut the closing strips of the ceiling tube cover to the appropriate length. Two strips are required.



- ✎ Insert both halves (2) of the ceiling tube cover into the groove of the holding flange (1) above.
- ✎ Insert both halves (2) of the ceiling tube cover into the groove of the silicone retaining ring (4) below.
- ✎ Attach both closing strips.



- ✎ Using a hexagon spanner, fix the holding flange (1) in such a manner that the ceiling tube cover is clamped but not deformed.

4.2 Connecting the Sim.CAM HD Touch on separate extension arm

4.2.1 Mount Sim.CAM HD TOUCH camera mount onto spring arm



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

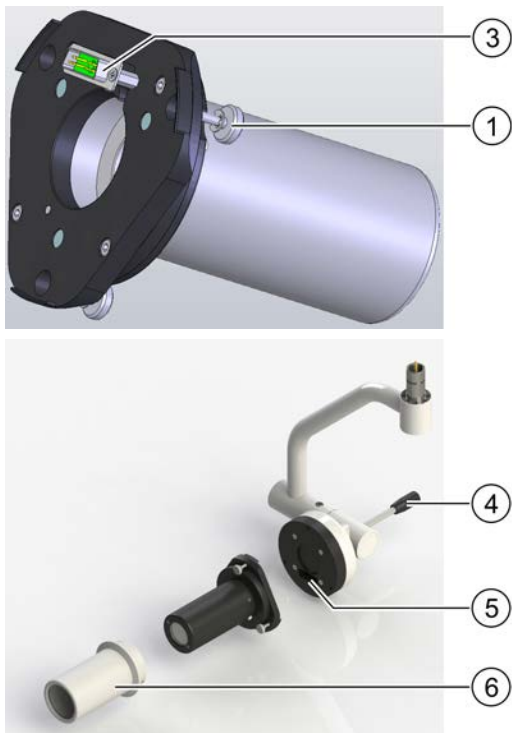
- ☞ Wear a protective helmet.
- ☞ Wear safety boots.



Camera mount with cardanic




- ☞ The cardanic for the camera mount is mounted the same way as the cardanic for the light head,
 - ☞ Mounting the light heads onto the spring arm

4.2.2 Mounting the Sim.CAM HD TOUCH onto the camera mount

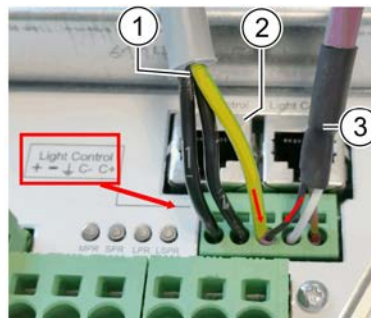
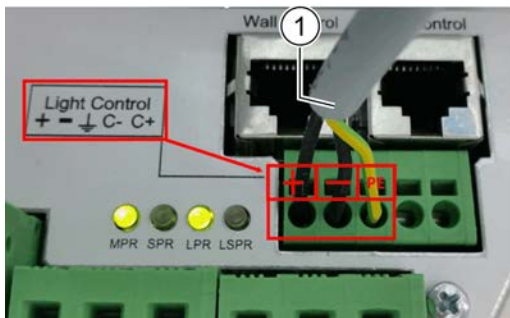


- ☞ Disconnect the power supply.
- ☞ **Do not touch the sub-D plug (3) in order to protect from electrostatic discharge!**
- ☞ Plug the D-sub connector (3) found on the rear of the camera unit into the socket (5) on the camera mount. In doing so, press in the entire unit firmly and uniformly.
- ☞ Tighten the camera unit with the knurled screws (1). To do so, turn the knurled screws in a clockwise direction. When the knurled screws have been tightened, the position of the unit must be checked by uniformly pressing on it once again.
- ☞ Slide the sterilisable handle (6) onto the camera unit and turn until the safety snaps audibly into position.
 - ⇒ The camera unit is ready to use.
 - ⇒ Unsterile positioning may be performed using the handle (4) on the back side of the bracket, while sterile positioning can be performed using the sterilisable handle (6). Changing the sterilisable handle, ↪ *Sim.LED Instructions for Use*.
- ☞ Switch on the power supply once again.

4.2.3 Connecting the Sim.CAM HD TOUCH

	<p>Danger of electric shock!</p>
	<p>The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.</p>
	<p>Damage or destruction from overvoltage!</p>
	<p>The contract unit of the HD Touch may exclusively be connected and operated with 28 V DC at the specified "Light Control" of the terminal of the switching power supply. A 100-240 V connection will immediately destroy the device!</p>


Connecting the power supply, Sim.CAM HD Touch in light head



☞ Connect the power supply cable (1) of the camera's control unit to the power supply, as shown at left:

- 1: +
- 2: -
- GNYE: PE

- ☞ Connect the control lines (3) of the light to the right. In this case, the PE terminal must be used for control lines (3, grounding shield) and camera control unit (1, GNYE) together, as shown in the photo on the right.
- ☞ If wall controls are present, they are to be connected to the RJ45 socket,
 - ☞ "Mounting and connecting the power supply unit for surgical lights to the ceiling tube", page 49.

	<p>Damage or destruction due to incorrect connection!</p>
	<p>The control device of the HD Touch may only be connected and operated with the switching power supply which is also connected to the associated light with video camera and corresponding video line from the central axis!</p>

Connecting the power supply, Sim.CAM HD Touch on separate arm

The Sim.CAM HD Touch on separate arm is always to be connected to a separate switching power supply!



- ☞ Connect power supply for Sim.CAM HD TOUCH to power supply 1 (1, on the left of the photo).
- ☞ Connect power supply for HD TOUCH control unit to power supply 2 (5, on the right of the photo).

- ☞ Connect the control lines (3) of the light to the right. In this case, the PE terminal must be used for control lines (3, grounding shield) and HD TOUCH control unit (5, GNYE) together, as shown in the photo on the right.
- ☞ Connect power supply for the light to power supply 2 (6, on the right of the photo).
- ☞ Connect wall controls (if present) to RJ45 socket (2).
- ☞ In order to avoid potential communication interference, connect the negative pole of the power supplies of the Sim.CAM HD TOUCH (on the left of the photo) and the HD TOUCH control unit (on the right of the photo) with a black cable (4). This cable may be a maximum of 1.5 m long. This will suffice on the ceiling tube; with other mounting types, ensure that the two power supplies are suitably close to one another!

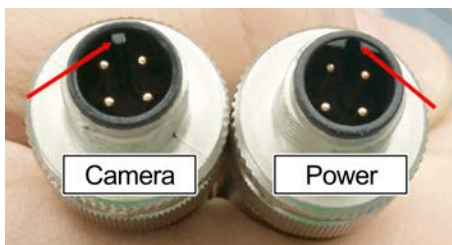
⚠ WARNING

Damage or destruction due to incorrect connection!

The control device of the HD Touch may only be connected and operated with the switching power supply which is also connected to the associated light with video camera and corresponding video line from the central axis!

Mounting

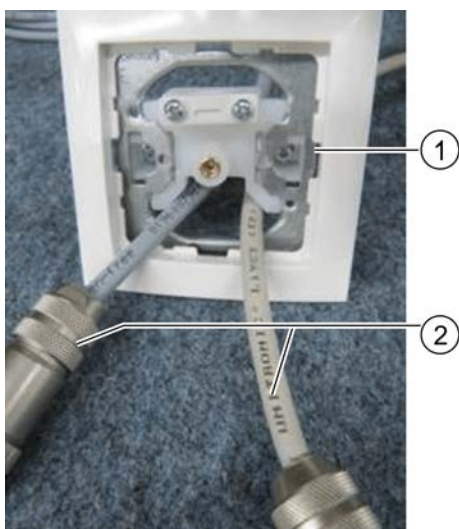
Connecting the HD Touch control unit



NOTICE

Avoid confusing the cable connections!

- ☞ Connect the power cable to the power socket (3).
- ☞ Connect the camera cable to the camera socket (1).
- ☞ Connect the video output signal to HD-SDI Out (1 or 2) or DVI Out.
- ☞ Mount the ferrite core (1) to the power cable and secure with a cable tie (2).



Flush mounting the cable

- ☞ Pull the cable (2) through the cable cover (1).
- ☞ Screw on the cable cover's (1) lid.

4.3 Mounting the Sim.CAM HD (Sim.LED 5000/7000 only)

The camera is an optional accessory and can be installed on the light head of ceiling variants in place of the sterile handle or the handle unit.



Camera on a separate arm

- ☞ Disconnect the power supply.
- ☞ Ensure that both latching tabs (1) are fully open. The red surfaces must be visible!
 - ⇒ The connector base (2) is encoded. A turning out of position is not possible.
- ☞ Slide the camera module into the socket (3).
 - ⇒ The camera must sit fully in the socket.

Lock module

- ☞ Press down on both latching tabs (1) until the red markings can no longer be seen.



Mount sterilisable handle

- ☞ Slide the sterile handle onto the handle unit and turn until the release button (4) snaps audibly into position.
- ☞ Switch on the power supply at the control unit.
 - ⇒ The camera is ready for operation.

Remove sterilisable handle again if necessary

- ☞ Press release button (4).
- ☞ Pull off sterilisable handle.

Mounting



Camera on the lighting handle

- ☞ Remove sterilisable handle. To do so, press the release button (4).
- ☞ Pull off sterilisable handle.
- ☞ Inspect the sterile handle for wear and damage, dispose of and replace it if necessary.



- ☞ Hold handle firmly.
- ☞ Open latching tabs (1). The red surfaces must be visible!
- ☞ Remove the handle unit.



- ☞ Install the camera on the lighting handle identically as with the camera on a separate arm,
 ☞ *“Camera on a separate arm”, page 67.*

4.3.1 Sim.CAM HD terminal board

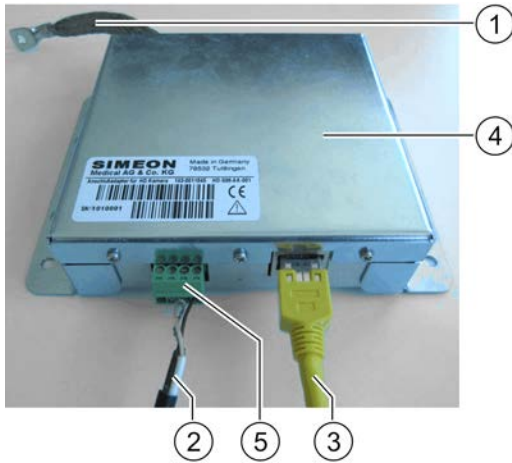
⚠ WARNING



Danger of electric shock!

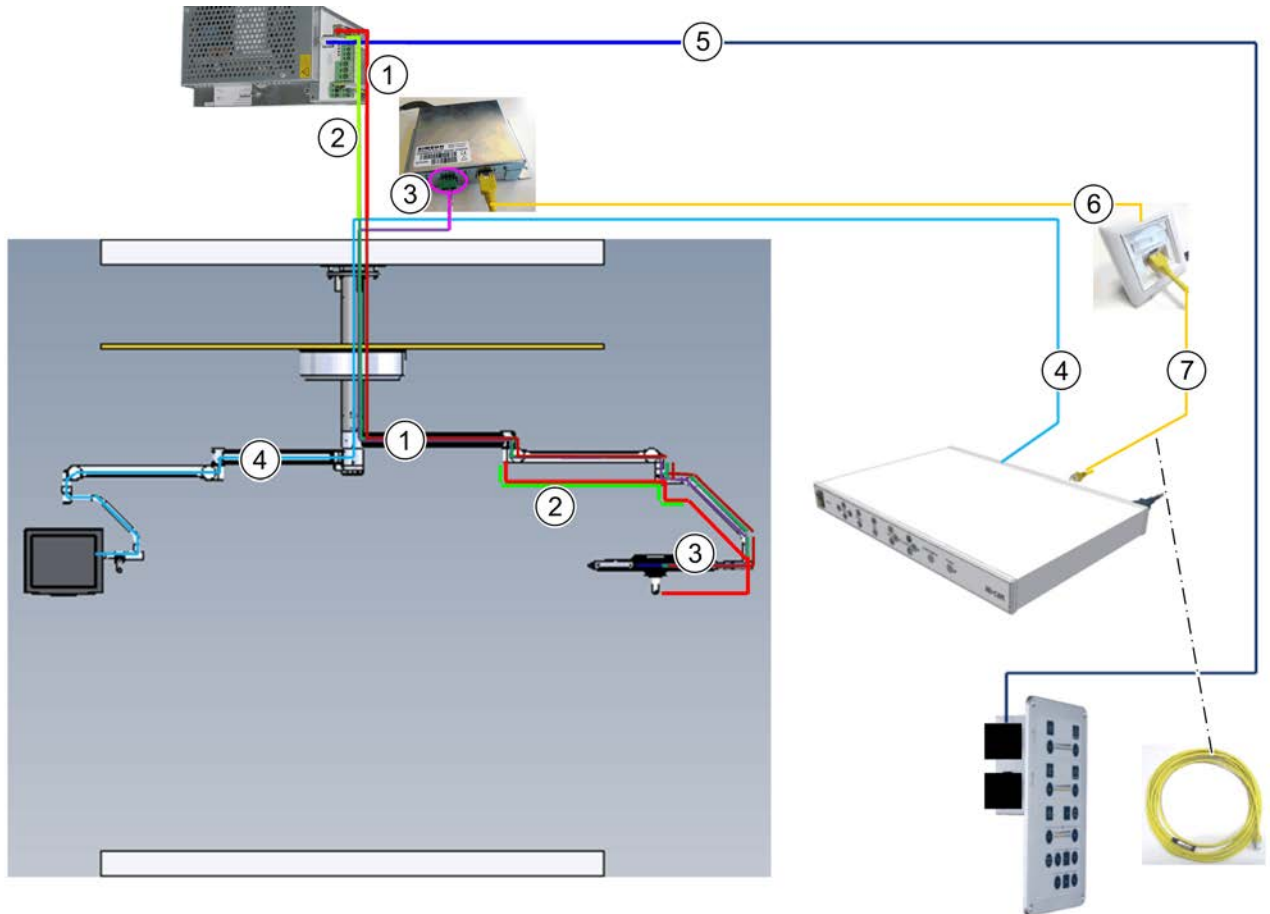
The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.

The terminal board for the Sim.CAM HD is normally mounted in the ceiling flange. If the terminal board is found outside of the laminar flow ceiling, a longer earth wire (braided mains cable, minimum cross-section 10 mm²) must be used.

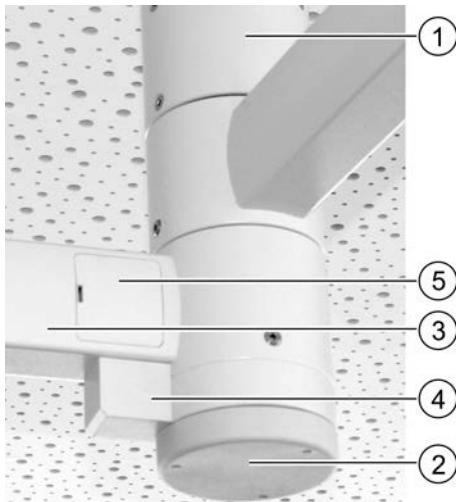


- ☞ Electrically connect the metal housing of the terminal board (4) with the metal housing of the ceiling flange, in an HF-compatible manner. To do so, use the enclosed, flexible braided mains cable (1). The braided mains cable must have a minimum cross-section of 10 mm².
- ☞ Connect the yellow 20 m patch cable (3) (video input signal), to the control unit for the Sim.CAM HD.
- ☞ Connect the other end of the patch cable (3) to the terminal board (as shown in the image).
- ☞ Plug the cable with the Phoenix connector (5) into the terminal board and plug the other end (S-video connector) into the S-video socket in the central axis.
- ☞ The plug-in connection (2) and S-video socket of the central axis must be secured against tensile strain!

4.3.2 Example: Sim.CAM HD wiring diagram



- 1 CAN connection from power supply to light / camera
- 2 Power supply for light
- 3 Video signal and control unit for Sim.CAM HD
- 4 HDSDI cable from the control unit's output to the monitor input
- 5 RJ45 patch cable between the power supply and wall controls (for wall controls)
- 6 20 m RJ45 patch cable between adapter and wall socket
- 7 5 m connecting cable between wall socket and control unit



- ☞ Remove cap (2).
- ☞ Connect video cable in the central axis with the black connection cable. Pull cable through ceiling tube and extension arm.
- ☞ The plug-in connection and S-video socket of the central axis must be secured against tensile strain!
- ☞ Remove cover (5).
- ☞ Guide the cables through the extension arm (3) without placing them under mechanical strain, so they are not damaged during rotational movement.
- ☞ Push back approx. 5 cm of cable reserve into the extension arm.
- ☞ Pull video cable and then power cable through the extension arm and spring arm,
- ☞ ↪ Mount rotating canopy to Sim.Flex extension arm and normal central axis
- ☞ Connect the Sim.CAM HD according to the *Instructions for Use 100-0010175*.

4.3.3 Connecting the Sim.STREAM



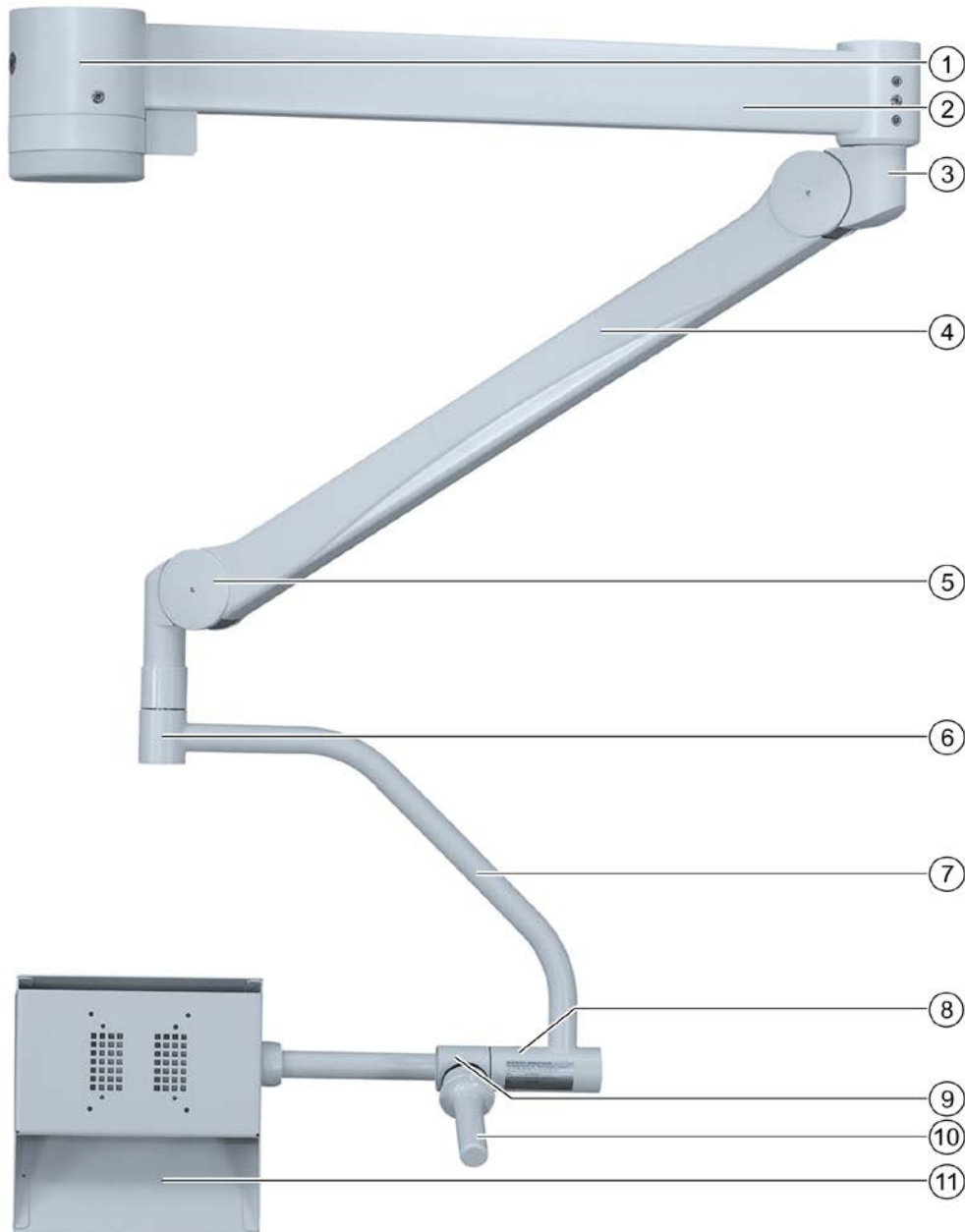
- ☞ Use the cold lead to connect Sim.STREAM (2) to the connection (6) with the Schuko socket.
- ☞ Connect BNC cable to the BNC socket (3, HD-SDI) of the HD control unit (1) and connect it with the BNC socket (4, SDI-IN) of the Sim.STREAM (2).
- ☞ Use the cold lead to connect the HD control unit (1) to the connection (7) with the Schuko socket.

4.4 Mounting the Sim.SCREEN monitor suspension

NOTICE

Before mounting, check that the stop pieces at the central axis are correctly positioned.
 ↳ "Mounting the round central axis", page 33.

4.4.1 Overview



- 1 Extension arm/central axis end
- 2 Extension arm
- 3 Spring arm joint
- 4 Spring arm

- 5 Spring arm joint
- 6 Cardanic pivot for spring arm
- 7 Cardanic tube
- 8 Cardanic pivot for monitor

- 9 Joint on sterilisable handle
- 10. Sterilisable handle
- 11 Monitor mount

4.4.2 Mounting the extension arm

↳ “Mounting the round central axis“, page33.

4.4.3 Mounting adapter to AC3000/OSP spring arm

The adapter for the AC3000/OSP Ondal spring arm is mounted before the AC3000/OSP spring arm is mounted to the central axis.

⚠ CAUTION



Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

- ☞ Wear a protective helmet.
- ☞ Wear safety boots.
- ☞ Wear protective gloves.

⚠ WARNING



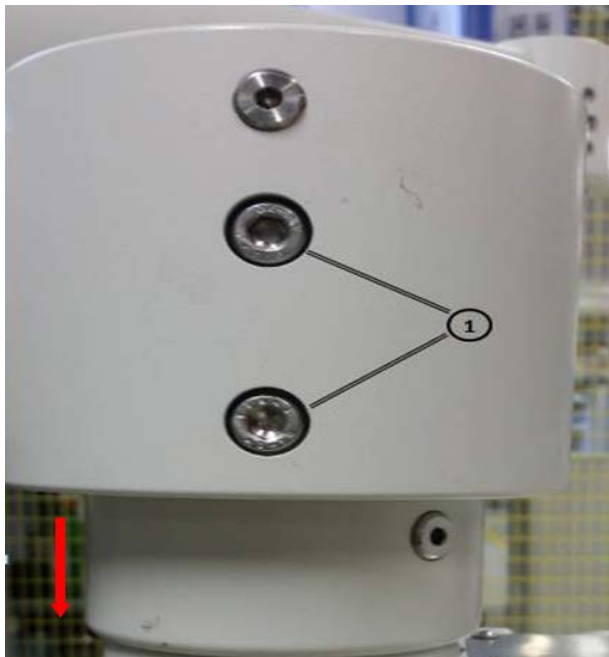
Risk of injury due to a collapsing spring arm!

The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts! Only mount locking ring once.



- ☞ Dismantle locking ring (1), washer (2) and protective sleeve according to manufacturer's assembly instructions.

Mounting



In this variant, the adapter is delivered mounted on the extension arm or the extension arm.

- ☞ Put your hand under the opening in the socket and secure it to prevent it from falling.
- ☞ Loosen the two M8 cylinder screws (1) on extension arm.
- ☞ Remove the brake screw (2) from the threaded hole.
- ☞ Remove adapter downwards from the extension arm (see red arrow)



- ☞ Insert the socket (5) on the pivot (9) of the spring arm (4) and make sure that the grounding conductor is not pinched (photo at left)
- ☞ Mount the washer (7) - the pivot groove for the locking ring (6) remains free in the process (photo at right)

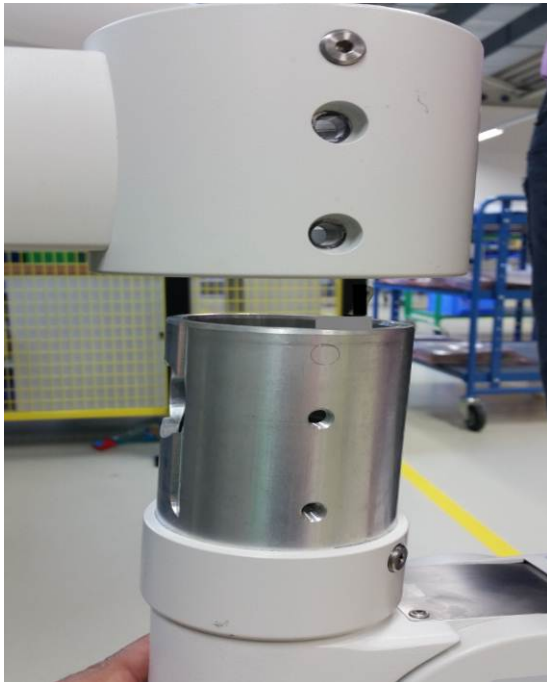


- ☞ Mount locking ring (6) according to manufacturer's specifications (similar to photo at left).



- ☞ Mount grounding conductor to adapter with enclosed M4 screw.
2 Nm torque.

4.4.4 Mounting the AC3000/OSP spring arm



- ☞ Align the spring arm with adapter vertically and horizontally and place it in the extension arm as far as it will go so that the threaded holes for the cylinder screws are aligned with the holes in the extension arm.



- ☞ Mount the spring arm with both cylinder screws (1) M8.
16 Nm torque.
- ☞ The cable insertion, final assembly and settings are to be conducted according to the installation instructions of the company Ondal Medical Systems OndaSpace.

4.4.5 Mounting the Sim.SCREEN monitor mount to the AC3000/OSP spring arm

CAUTION

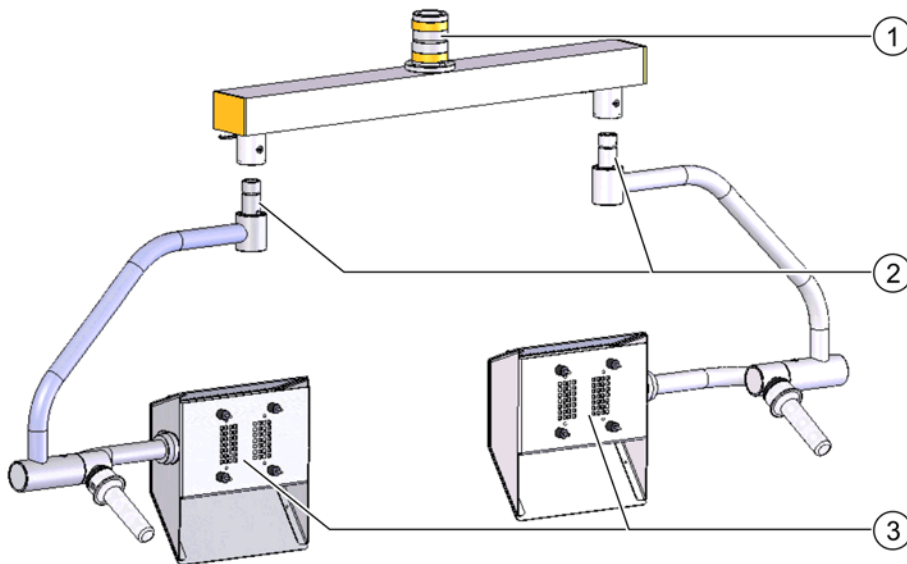


Danger of injury from falling parts!

Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.

- ☞ Wear a protective helmet.
- ☞ Wear protective gloves.

The Sim.SCREEN dual monitor mount (1) is mounted according to the installation instructions of the company Ondal Medical Systems OndaSpace.





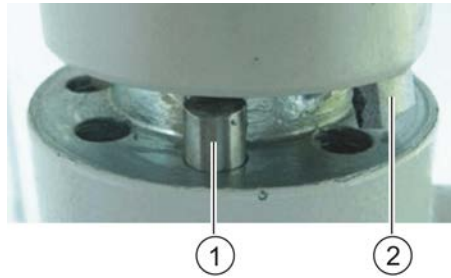
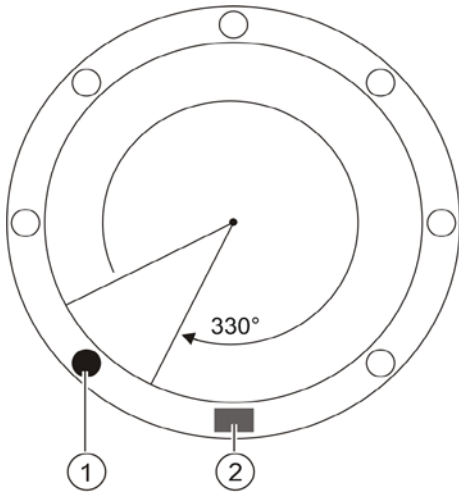
When mounting a dual monitor bridge, two different interfaces must be installed:

- Monitor cardanic at the bridge (2): Mounting is similar to the mounting of the light head to the spring arm, but without a turning connector,
 - ☞ Mounting the extension arm

4.4.6 Sim.SCREEN monitor mount: Positioning the lateral stop pieces

An extension arm for a monitor mount can be provided for at the lowermost or uppermost position of the central axis. Since the monitor is connected in wired form, this extension arm must be secured against overtwisting using at least one stop piece at each joint, to prevent the overextension and breaking of the cables.

<p>▲WARNING</p> 	<p>Danger of electric shock!</p> <p>If a stop piece is forgotten during assembly of a monitor mount, this may result in a short circuit or, in an extreme case, in electric shock during operation of the monitor.</p>
<p>▲CAUTION</p> 	<p>Danger of injury from falling parts!</p> <p>Since mounting the arms requires overhead work, injuries can be caused by parts falling from above.</p> <ul style="list-style-type: none"> ☞ Wear a protective helmet. ☞ Wear protective gloves.



The stop piece (2) is firmly mounted at the spring arm joint. The stop pins (1) may be variably used in the monitor mount. A stop pin is an integral component of the mounting materials that are included with every monitor mount ↪ *“mounting materials”, page 84.*

☞ Disconnect the power supply.

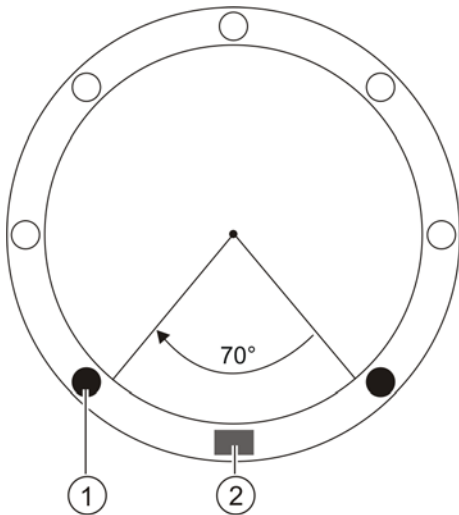
☞ Place the stop pin (1) on the desired position.

Note: The stop pin must be inserted entirely into the opening; otherwise, the attachment at the spring arm will be problematic.

⇒ When using only one stop pin, the swing equals approx. 330°.

⇒ With two stop pins, the movement radius for the monitor mount can be limited; the minimum angle is 45°.

☞ When turning the extension arm, check whether the desired range of rotation has been achieved. Otherwise, adjust the stops.



4.4.7 Connect monitor suspension cabling

⚠ WARNING

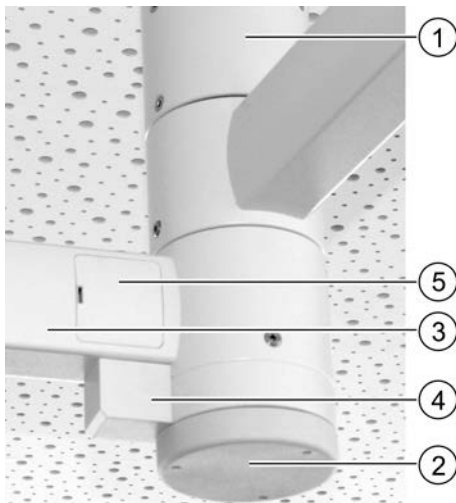


Danger of electric shock!

Chafed cables may produce an electric shock! Lay the cabling without placing it under mechanical strain and use a bending radius large enough to avoid damage during canopy rotation.

Only use original parts from the manufacturer!

Round ceiling tube: Cabling to spring arm



☞ Remove the cap (2).



☞ Pull cable with video output signal through ceiling tube (1) and extension arm (3, 4): Black video cable for Sim.CAM SD; cable for HD control unit for Sim.CAM HD.

☞ Remove cover (5).

☞ Pull cable through ceiling tube and extension arm. Guide the cables through the extension arm without placing them under mechanical strain, so they are not damaged during rotational movement.

☞ Push back approx. 5 cm of cable reserve into the extension arm (3).

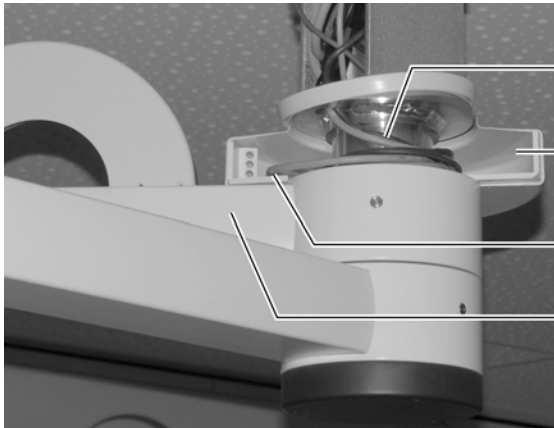
☞ Insert the cables carefully into the joint (6) of the spring arm.

☞ Insert the cabling without placing it under mechanical strain and use a bending radius large enough to avoid damage during rotational movements.



Note: If the cable plugs do not fit into the opening between the extension arm and the spring arm adapter, undo the installation socket and remove cables from the extension arm.

Sim.FLEX ceiling tube: Cabling to spring arm



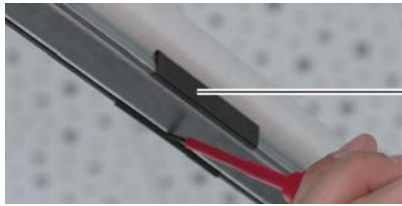
- ☞ With the rotating canopy open (2, ☞ *“Mounting canopy to ceiling tube”, page 58*), wind the cables (1) around the ceiling tube in 3 windings to ensure enough reserve cabling for the extension arm's rotational range.
- ☞ Choose the direction of rotation so that the cable cannot be damaged when the extension arm is rotated from stop to stop. To do so, it must be exposed without tensile strain in every position of the extension arm.
- ☞ Insert the cables into the aperture (3) on the extension arm (4) and push through until the cabling is visible at the front end of the arm.



- ☞ Insert the cables carefully into the joint (7) of the spring arm.
 - ☞ Insert the cabling without placing it under mechanical strain and use a bending radius large enough to avoid damage during rotational movements.
- Note:** If the cable plugs do not fit into the opening between the extension arm and the spring arm adapter, undo the installation bushing and remove cables from the extension arm.
- ☞ Fit the cover (6) using 2 countersunk screws (5).

Mounting

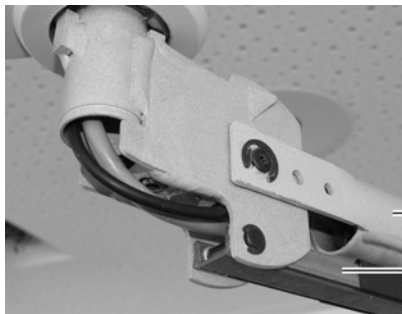
Cabling from the spring arm



7

- ☞ Carefully loosen the clamps (7) on both sides with a screwdriver and slide upwards.

Note: The panelling for the spring arm is disassembled for delivery.



8

9

- ☞ Insert the cabling through the spring arm's (8) cable inlet without placing it under mechanical strain, and use a bending radius large enough to avoid damage during rotational movements.

Note: Lay the cabling without any crossover.

- ☞ Slide the clamps (9) downwards and allow to snap into place. In the process, make sure that the cables are not pinched.

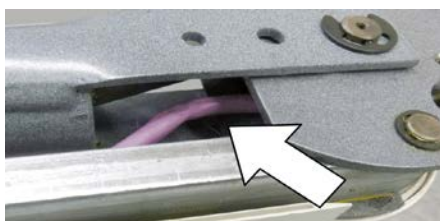


1

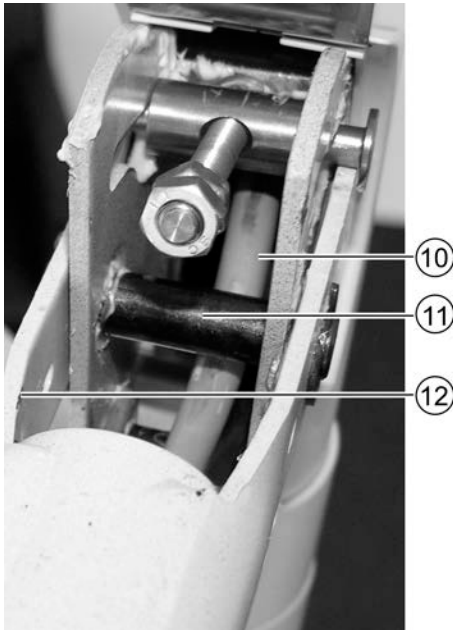


1

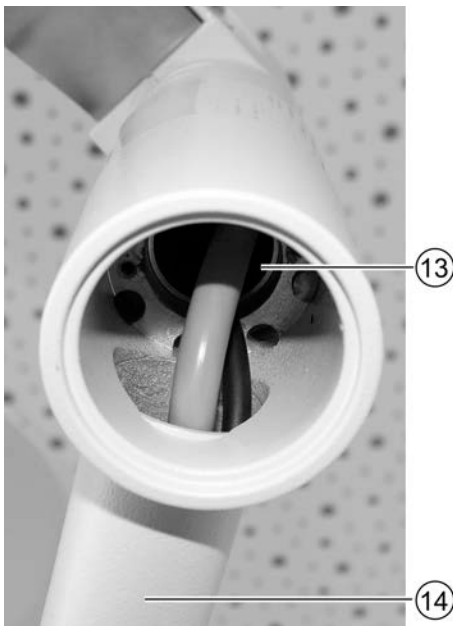
- ☞ In addition, secure the cables with cable ties (1) so that they cannot escape from the cable inlet even when the spring arm moves.



Note: Cables escaping from the cable inlet can be pinched and become damaged when the spring arm moves. A CAN cable that is damaged in this manner may result in a malfunction, for example.



- ☞ Guide the cable (10) located at the spring arm's joint (12) below the screw connection (11), downwards through the spring arm's head, in the direction of the cardanic pivot (13, image below).
- ☞ Insert the cabling without placing it under mechanical strain and use a bending radius large enough to avoid damage during rotational movements.

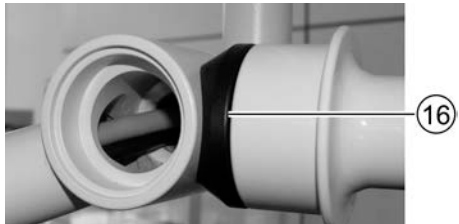


- ☞ Insert the cabling through the cardanic pivot (13) into the cardanic tube (14) without placing it under mechanical strain, and use a bending radius large enough to avoid damage during rotational movements.

Mounting



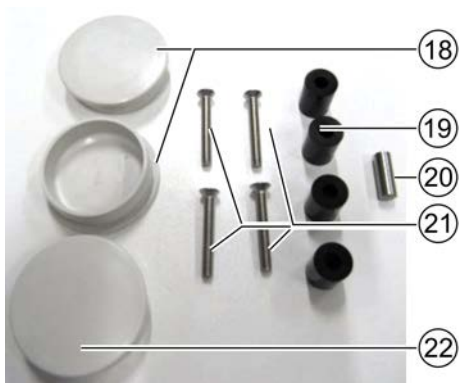
- ☞ Starting at the cardanic tube (14), thread the cabling through the monitor joint (15) without placing it under mechanical strain, and use a bending radius large enough to avoid damage during rotational movements.



- ☞ Insert the cabling through the joint at the sterilisable handle (16) without placing it under mechanical strain, and use a bending radius large enough to avoid damage during rotational movements.



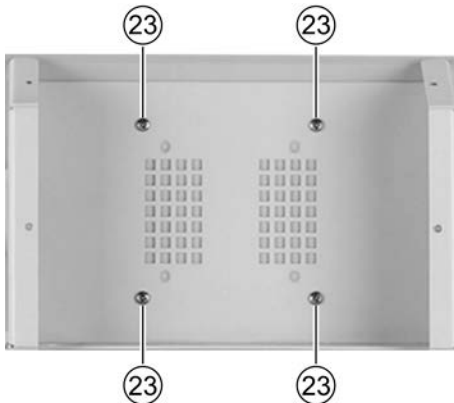
- ☞ Carefully pull the cable at the monitor mount (17).
- ☞ Mount angled mains connector (SCHURTER article 4785) according to instructions from the company Schurter (www.schurter.com).



Note: These mounting materials are included with every Sim.SCREEN monitor mount:

- 2 x Kapsto covers (18) for cardanic pivots, monitor
- 1 x Kapsto cover (22) for cardanic pivots, spring arm
- 4 x mounting screws (21) long, for mounting with distance sleeves
- 4 x distance sleeves (19)
- 1 x stop pin (20)

- ☞ Mount the Kapsto cover.



- ☞ Mount monitor: Screw four screws into the corresponding threaded holes VESA100 (23) of the monitor.
- ☞ If the monitor mount covers aerating slots on the monitor, the use of distance sleeves (19, ☞ *“mounting materials“*, page 84) in combination with longer screws (21, ☞ *„mounting materials“*, page 84) will create a distance between the aerating slots and the monitor mount that will allow for ventilation of the monitor.
- ☞ Connect the monitor to the power supply unit and signalling cable.

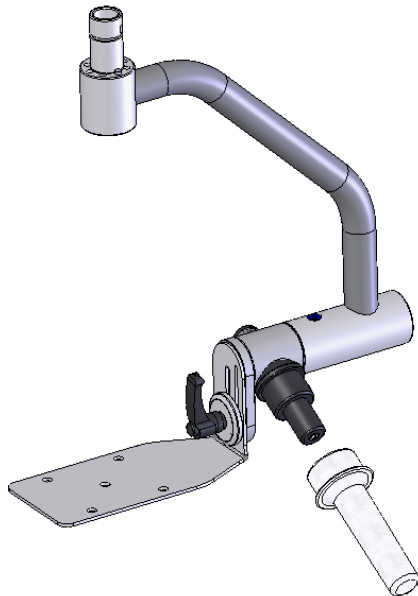


- ☞ Cabling the monitor:
 - 23: DVI in / HDMI in for HD cameras, SVIDEO in for SD cameras
 - 24: Power cable



- ☞ Screw the cover sheet (25) onto the monitor mount, using washers and flat head screws.
- ☞ Mount the casing for the spring arm.
 - ☞ *“Mount the spring arm shells on the spring arm (ceiling variant only)“*, page 107.

4.4.8 Mount GTP8 and GTP14



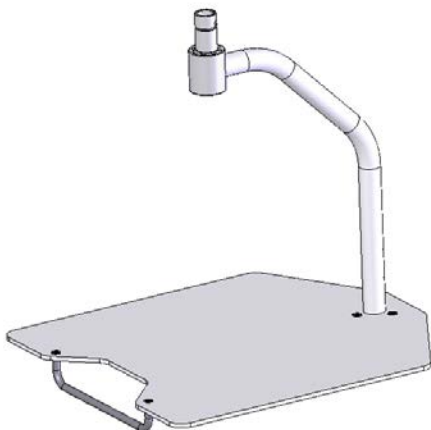
Mounting is similar to the mounting of the light head to the spring arm,

↳ Mounting the light heads onto the spring arm, but without a turning connector.

The lateral stops are adjusted as described in ↳ Sim.SCREEN monitor mount: Positioning the lateral stop pieces

Instructions for mounting of devices,

↳ *Instructions for Use Sim.LED 450/500/700 and Sim.LED 5000/7000.*



Mounting is similar to the mounting of the light head to the spring arm, ↳ Mounting the light heads onto the spring arm,




but without a turning connector.

The lateral stops are adjusted as described in ↳ Sim.SCREEN monitor mount: Positioning the lateral stop pieces

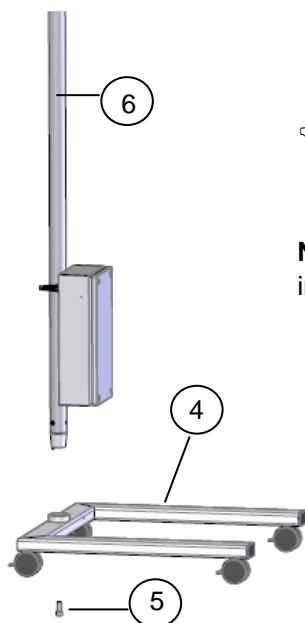
Instructions for mounting of devices,

↳ *Instructions for Use Sim.LED 450/500/700 and Sim.LED 5000/7000.*

4.5 Mounting the mobile variants (illustration similar)

	<p>Risk of injury due to pinching!</p> <p>Multiple parts must be assembled together or mounted onto one another. As a result, injuries may occur due to pinching.</p> <ul style="list-style-type: none"> ☞ Proceed cautiously during assembly. ☞ Mount with at least 2 trained and authorised technicians!
	<ul style="list-style-type: none"> ☞ Identify the spring arm by the product label and mount exclusively with the approve lights. Incorrect allocation may damage the spring arm and the light.
	<p>Danger of injury from falling parts!</p> <p>Incorrect allocation may damage the spring arm and the light and/or errors during assembly can compromise the stability of the lighting system, which can cause the system to collapse, potentially resulting in extremely serious injuries!</p>

4.5.1 Installation of mobile variants report



- ☞ Insert the conical end of the stand tube (6) into the cart (4) so that it is correctly positioned and tighten with the included screw (5) at a torque of 30 Nm.

Note: A rivet is integrated into the base. Insert the rivet into the hole in the tube. This prevents an incorrect assembly!

Mounting



First, mount the washer and place the sleeve on the spring arm.

Remove the pre-installed countersunk screws.



Tighten sleeve with cylinder head screw at a torque of 4 Nm.



Mount angle plate until stop and screw in.
Tighten brake screw.



Insert the pin of the mobile stand connector into the corresponding groove of the sleeve and screw together until it stops.



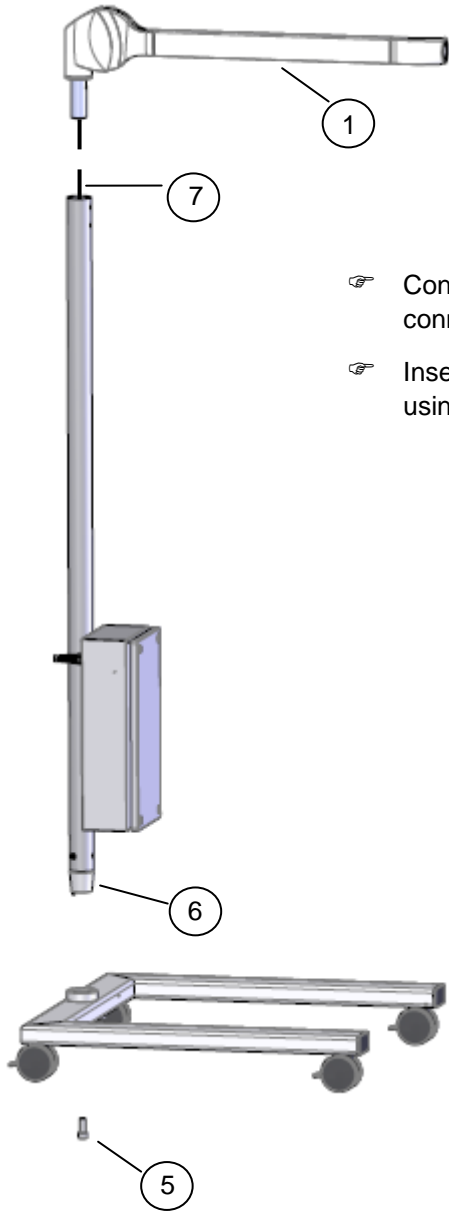
Then remove the cable tie on the stand tube without letting it fall into the stand tube.



The connector combination is inserted into the stand tube and the threaded holes in the adapter sleeve are aligned exactly vertically with the holes of the stand tube.

After that, the spring arm is inserted into the stand tube as far as it will go.

Mounting



- ☞ Connect the plug (7) pertaining to the static tube (6) to the cable connection for the LC spring arm (1).
- ☞ Insert the LC spring arm (1) into the static tube and secure using the two Phillips screws (4).

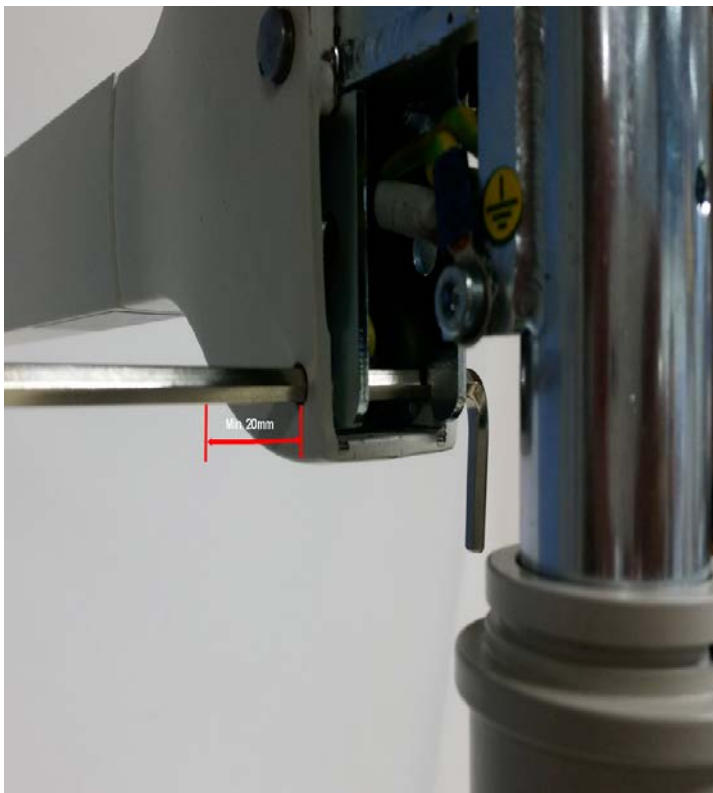
4.5.2 Mount spring arm on stand (Module variant only)



Fix all brakes of the mobile stand.

Press spring arm downwards into the horizontal position so that the holes align with the slots.

When aligning, insert the SW 5mm Allen key so that it is completely inserted and overlaps by at least 20 mm on both sides!



⚠ WARNING



Spring arm snapping up

The installed Allen key must not be moved or removed before the final assembly of the lights!

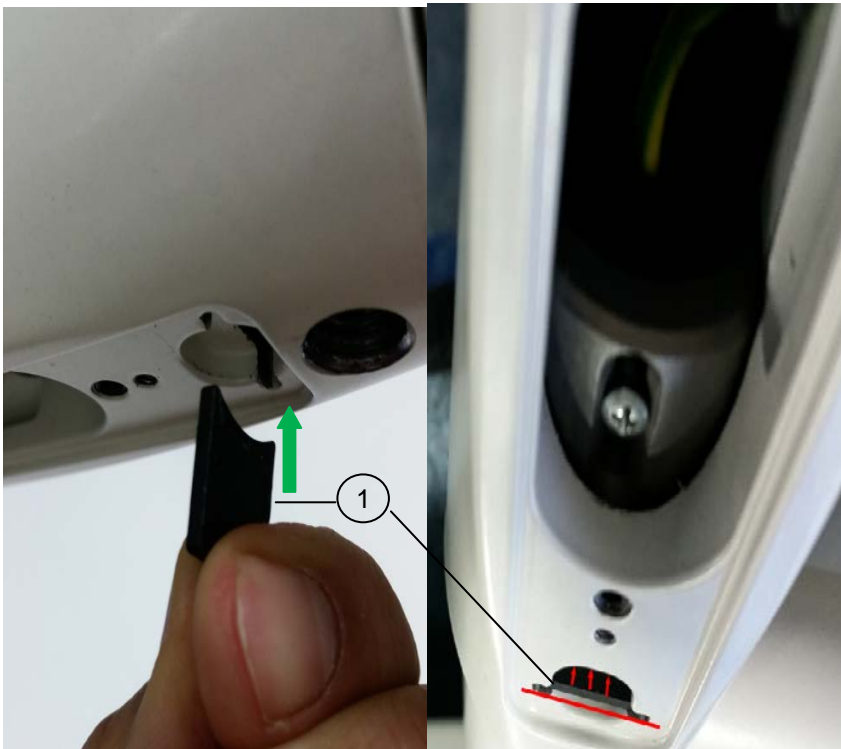


Align the bearing pin of the light horizontally and vertically on the mount and insert as far as it will go.



Remove the angle plate (red arrow) and simultaneously slide the locking plate (1) in the correct position into the corresponding groove as far as it will go (green arrow).

You must be 100% certain that the locking plate (1) is mounted as far as it will go!



⚠ WARNING

If the locking plate (1) is not mounted as far as it will go, the light can fall down!

Spring arm snapping up

If the locking plate (1) is not mounted as far as it will go, the light can fall down and the spring arm can snap up!

No one may stand beneath the components of the spring arm during the mounting process.

It must then be ensured that the locking plate (1) is mounted as far as it will go and has not moved out before the cover (2) for the locking plate (1) is mounted.

After that, screw on the cover (2) and make sure that it is fitted flush with the adjacent areas.

Mount brake screw and adjust spring force as necessary.



4.5.3 Adjust spring force on spring arm (mobile variant only)

CAUTION



Risk of injury due to pinching!

Multiple parts must be assembled together or mounted onto one another. As a result, injuries may occur due to pinching.

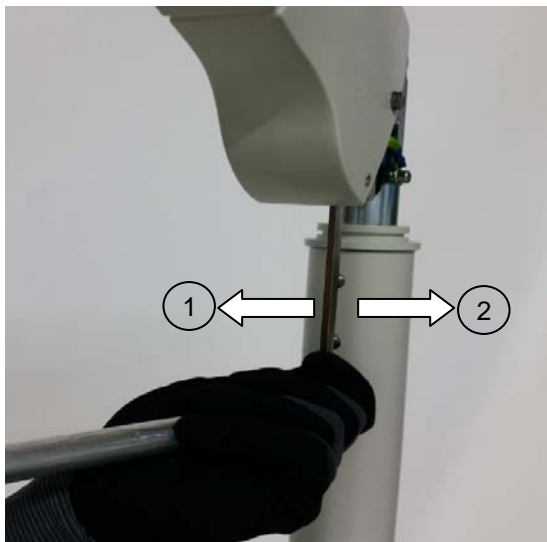
- ☞ Proceed cautiously during assembly.
- ☞ Mount with at least 2 trained and authorised technicians!



Remove SW 5mm Allen key (red arrow) while moving the light slightly.

Move light upward until it stops and hold in horizontal position.

Insert SW 6mm Allen key into the intended opening as far as it will go.



Place the enclosed tube on completely and use to turn. Wear protective gloves.

Insert SW 6mm Allen key into the intended opening as far as it will go.

Turn Allen key to the left (1) -> spring force will increase.

Turn Allen key to the right (2) -> spring force will be reduced.

Remove tube and Allen key after setting the spring force.

4.5.4 Mounting covers on mobile variant

CAUTION



Risk of injury due to pinching!

Multiple parts must be assembled together or mounted onto one another. As a result, injuries may occur due to pinching.

- ☞ Proceed cautiously during assembly.
- ☞ Mount with at least 2 trained and authorised technicians!



First, bring the front covers together in the correct position and mount them.

After that, mount the locking rings on both sides according to manufacturer's specifications.



Bring the rear covers together in the correct position and mount them.

Pay attention to make sure that the studs audibly click into place with the counterpart on the inside and make sure that the cover is completely closed all the way around.

4.5.5 Establishing power supply for mobile variant

The mobile variant is equipped with commercially-available Schuko plugs.

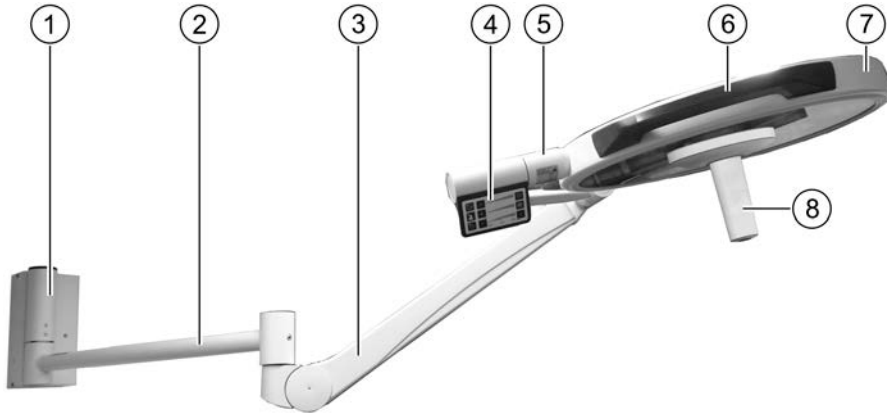
⚠ WARNING



Danger of electric shock!

The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.

4.6 Mounting the Sim.LED 450 wall variant



- | | |
|----------------------------------|-------------------------|
| 1 Wall bearing | 5 Cardanic |
| 2 Extension arm | 6 Handles (non-sterile) |
| 3 Spring arm with lateral outlet | 7 Light head |
| 4 Light controls (MC) | 8 Sterilisable handle |



Risk of injury due to falling objects!

- ☞ Do not hang any objects on the load-bearing system or fasten them to it!



Risk of injury due to pinching!

Multiple parts must be assembled together or mounted onto one another. As a result, injuries may occur due to pinching.

- ☞ Proceed cautiously during assembly.
- ☞ Mount with at least 2 trained and authorised technicians!

4.6.1 Mounting the wall bearing

Special tools

- Spirit level
- Torque spanner
- Circlip pliers with expansion control



Danger of electric shock!

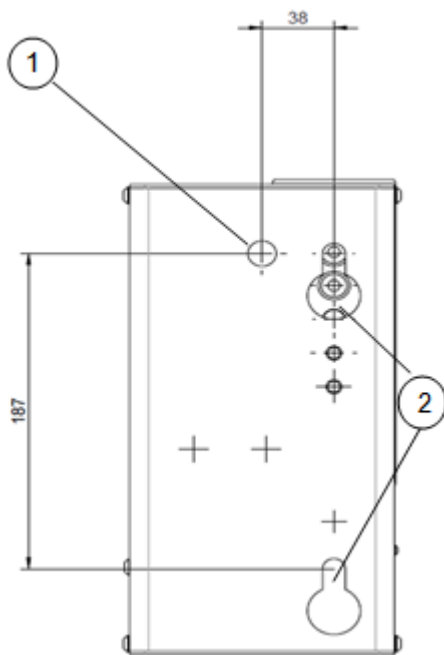
The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.



Risk of death due to heavy objects!

Parts could fall down while the components are being mounted. This could cause severe or even fatal injuries.

- ☞ Never attempt to lift heavy objects by yourself.



- ☞ Allow a structural engineer to inspect and approve the wall, ☞ *"Confirmation of static bearing capacity"*, page 113.
- ☞ Ensure that the wall surface intended for mounting the wall bearing is even.
- ☞ There may be no offset areas in the wall.
- ☞ Disconnect the on-site supply line (1) from the mains and safeguard against reconnection.
- ☞ Ensure that the supply line remains de-energised until mounting of the light head is completed.
- ☞ Drill holes (2) into the wall for the stud bolts HSL3G M10/20 in accordance with the specifications of the manufacturer of the attachment bracket (www.hilti.de) and blow them out thoroughly.

⚠ WARNING

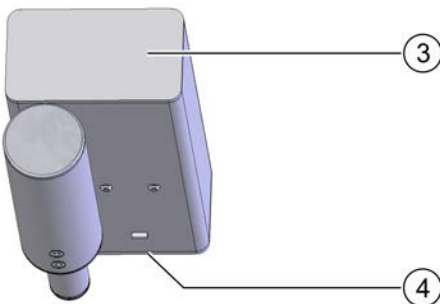
Risk of death due to improper fastening of stud bolts!

The collapse of the wall structure can result in a life-threatening situation.

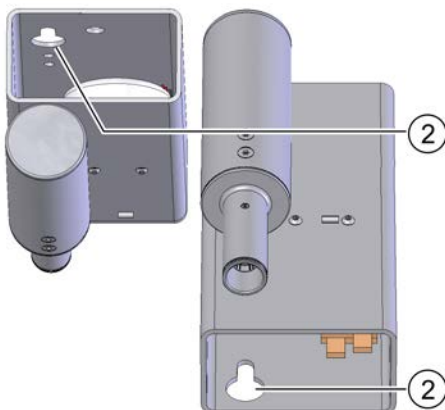
In order to mount the wall bearing with through-bolts or stud bolts, an "Individual case approval" by the competent regional building authority is mandatorily required.

In the case of unstable, lightweight partition walls, the installation of a metal rail structure will be absolutely required.

- ☞ Have the static bearing capacity of the structure tested and approved by a structural engineer.
- ☞ Adhere to the specified torque for the stud bolts.
- ☞ Dispose of used stud bolts.
- ☞ Do not reuse any used stud bolts.

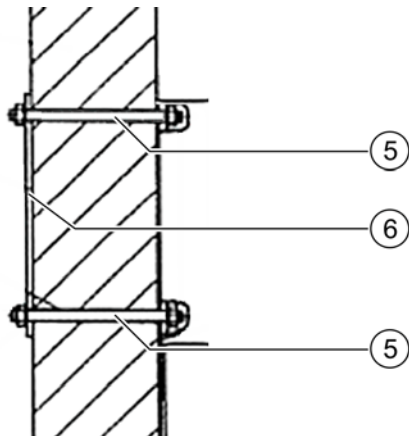


- ☞ Unscrew the covers (3, 4) from the wall bearing.



- ☞ Mount the stud bolts in accordance with the specifications of the manufacturer of the attachment bracket (www.hilti.de).
- ☞ Hook the wall bearing's slotted hole (2) onto the stud bolt.
- ☞ Straighten the wall bearing vertically using a spirit level.
- ☞ Tighten the nuts for the stud bolts with a 35 Nm torque.

Mounting



- ☞ If the bearing capacity of this wall does not allow for mounting with stud bolts, the mounting may be performed using through-bolts M8 or threaded rods M8 (5) and a counterplate (6).

4.6.2 Electrical connection

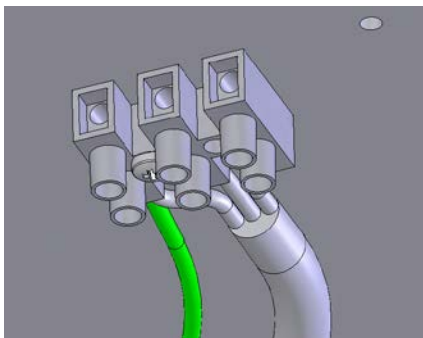
⚠ WARNING



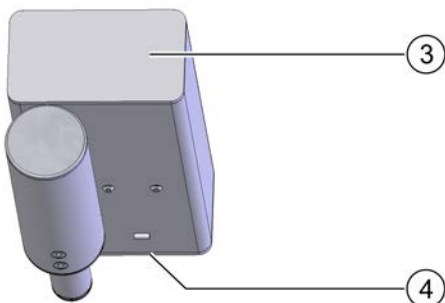
Danger of electric shock!

The on-site supply line must be disconnected from the mains on site before further work may be performed! The supply line must be secured to prevent reconnection.

- ☞ The power supply for the wall variant must be affixed and connected in a separate control cabinet.
- ☞ see Chapter 4.1.11



- ☞ Connect the supply line to the lustre terminal provided.



- ☞ Screw the covers (3, 4) back on again.

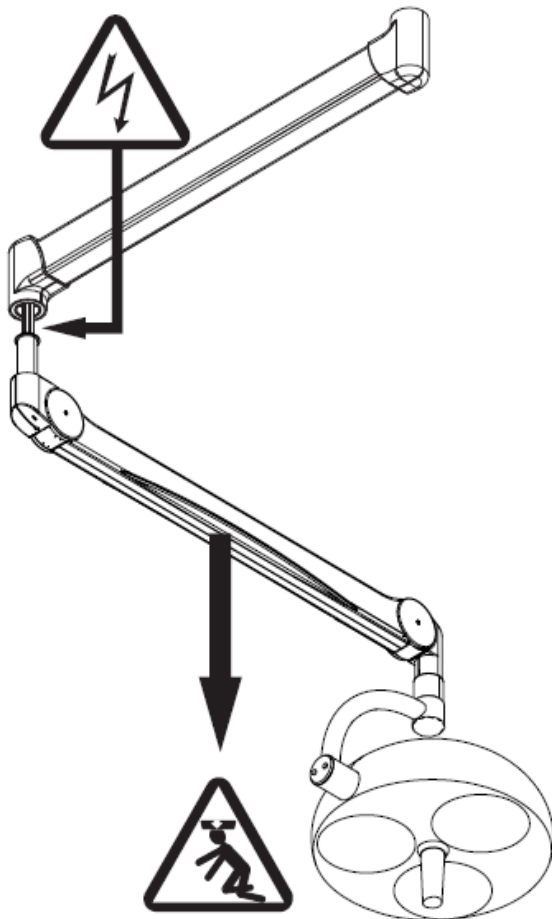
4.6.3 Mount extension arm and wall bearing, correct locking ring disassembly and mounting

Special tools

Crosshead screwdriver, circlip pliers with expansion control

⚠ WARNING

⚠ WARNING



Risk of death due to heavy objects!

Parts could fall down while the components are being mounted. This could cause severe or even fatal injuries.

- ☞ Never attempt to lift heavy objects by yourself.

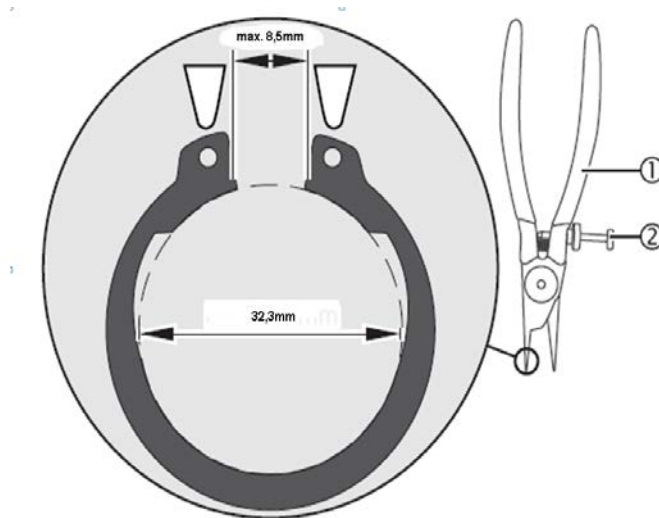
Risk of injury due to a collapsing spring arm!

The locking ring may not be overstretched and must properly snap into the groove when mounted! Otherwise, injuries may be caused by falling parts!

The spring arm is held in position by a locking ring in the spring arm. If the locking ring is overexpanded or incorrectly mounted during disassembly or mounting, it will fall out of the groove in the spring arm. As a result, the spring arm, adaption and end device will fall, possibly tearing out internal electrical supply lines. **This can cause severe injuries:**

- The locking ring may only be installed by trained and authorised qualified personnel.
- Suitable circlip pliers with expansion control must be used.
- The installation instructions and installation order must be complied with.
- Only use the locking ring removed in the initial installation one time, or use a new, unused locking ring.
- In service or maintenance cases, a new, unused locking ring will have to be used.

Illustration: Use of circlip pliers with expansion control:



The illustration shows an example of circlip pliers with expansion control ①.

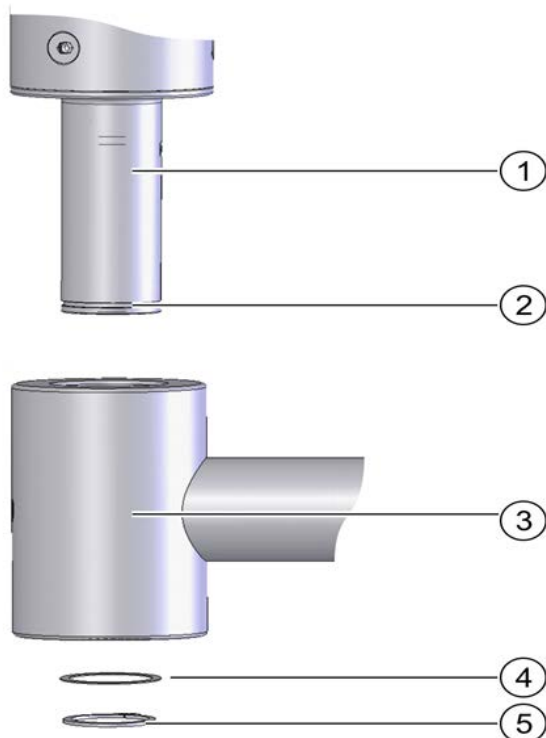
The expansion control prevents the locking ring from being overexpanded.

The locking ring may not be disassembled without circlip pliers with expansion control ①.

1. Turn the adjusting ring ② of the circlip pliers ① as far as it takes to provide an expansion control of the locking ring according to the illustration

of max. 8.5mm.

- This corresponds to an expansion of the locking ring inside diameter of 32.3mm.



☞ Push the extension arm (3) onto the mount (1) of the ceiling tube from below.

☞ Tighten brake screws.

Place a washer (4) over the support. The mounting process on the extension arm of the central axis is identical. Check to make sure that the washer (4) bearing pin (1) is mounted.

Only use the locking ring removed in the initial installation one time, or use a new, unused locking ring. In service or maintenance cases, a new, unused locking ring will have to be used.

Insert circlip pliers with expansion control into the eyes of the locking ring (5). Carefully check for the correct positioning of the locking ring (5).

☞ Loosen brake screw

⇒ With it, the extension arm will be affixed to the ceiling tube.

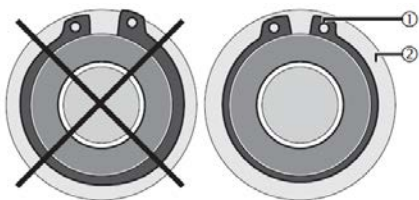
⚠ WARNING



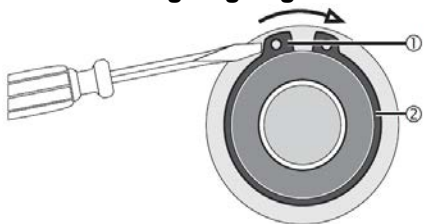
Acoustic test



Visual inspection



Check locking ring in groove



Collapse of bearer arm system:

An over-expanded locking ring can cause the bearer arm system to collapse:

- Carefully spread the locking ring (5) just as wide as it takes so that it can just be guided through the bearing pin (1).
- To do so, spread the locking ring (5) up to an inside diameter of 32.3mm. This corresponds to an internal dimension of max. 8.5mm between the eyes.
- The locking ring (5) must audibly click into the groove on the pivot (1) of the spring arm.

Check to make sure the locking ring is seated securely.

The locking ring must be positioned completely straight in the groove intended for it. This is done by taking the following steps:

Acoustic test:

- The locking ring must audibly click into the groove on the pivot of the spring arm.

Visual inspection:

The locking ring must not be uncircular.

The spacing of the two eyelets in a locking ring must correspond to the spacing in relaxed condition. If the distance is greater, it indicates that the locking ring is not mounted correctly.

Check locking ring in groove:

Place a small, fitting screwdriver on the eyelet of the locking ring and carefully turn the locking ring in the direction of the arrow.

- Make sure not to expand the locking ring or push it out of the groove.

Correct seating

- If the locking ring can be rotated in its groove, then the locking ring is mounted correctly.

Incorrect seating

- If the locking ring cannot turn, the locking ring must be removed and a new locking ring must be mounted in accordance with Chapter 4.6.3

4.6.4 Mounting the spring arm to the extension arm Sim.LED 450

Special tools

Crosshead screwdriver

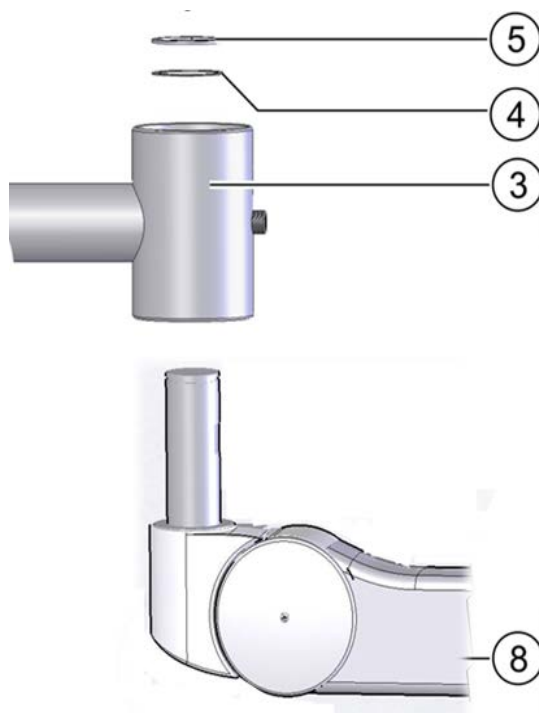
Circlip pliers with expansion control

⚠ WARNING

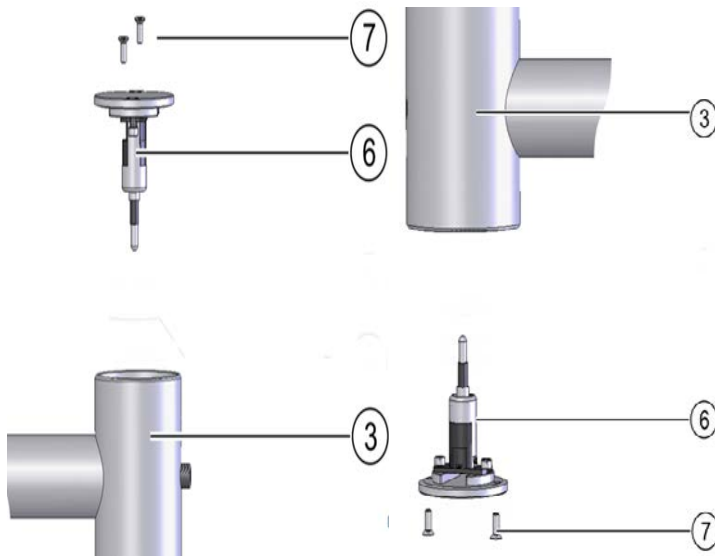
Risk of death due to heavy objects!

Parts could fall down while the components are being mounted. This could cause severe or even fatal injuries.

- ☞ Never attempt to lift heavy objects by yourself.
- ☞ Every time that you are done working on the spring arm, make sure that the locking ring (5) is undamaged and properly positioned.
- ☞ Do not reuse overstretched locking rings!



- ☞ **Dismantle locking ring (5) and washer (4) according to manufacturer's assembly instructions.**
- ☞ Insert the spring arm (8) into the extension arm (3) from below.
- ☞ Tighten brake screws
- ☞ **Dismantle locking ring (5) and washer (4) according to manufacturer's assembly instructions.**
- ☞ **Check locking ring (5) for correct seating according to manufacturer's assembly instructions.**
- ☞ Loosen brake screw
 - ⇒ Here, the spring arm will be affixed to the extension arm.
- ☞ Carefully slide the cover (6) with slip ring into the spring arm (8), and attach it to the extension arm (3) from above using 2 Phillips screws.
- ☞ Set the brake screws for the extension arm,
 - ☞ *Instructions for use of this lighting.*



☞ Carefully slide the cover (6) with slip ring into the spring arm (8), and attach it to the extension arm (3) from above using 2 Phillips screws.

☞ Set the brake screws for the extension arm,
☞ *Instructions for use of this lighting.*

Mounting

4.6.5 Mount light head on LC spring arm (wall and ceiling variant only)



Note: When placing the pivot in the LC spring arm, ensure that the turning connector (5) is not damaged!

For this purpose, remove the turning connector's protective cap only shortly before insertion, and carefully align the pin parallel to the LC spring arm.

A damaged turning connector cannot be used and must be disposed of.

Turn the assembly opening (4) in the sleeve downwards.

Unscrew the brake screw (3) on the underside of the sleeve (1).

Turn the sleeve (1) 90° and loosen up the first retaining screw (2).

Turn the sleeve (1) 180° and loosen up the second retaining screw (2).

Carefully align the pivot on the light head's cardanic (9, previous page) and insert in the spring arm.

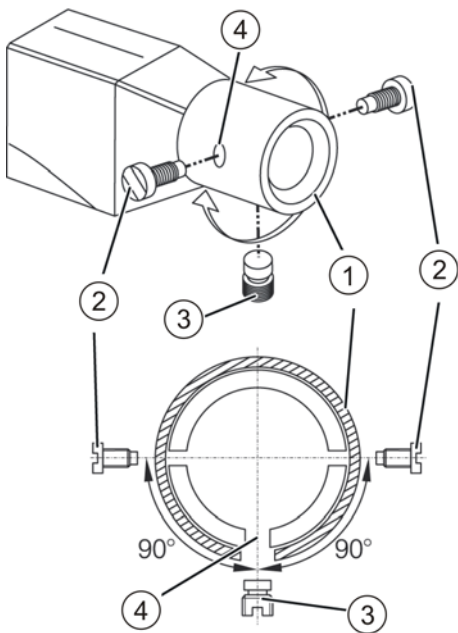
Tighten the sleeve's retaining screw (2).

Turn the sleeve (1) 180° and tighten the second retaining screw (2).

Turn the sleeve (1) 90° and screw in the brake screw (3). Adjust brake force according to manufacturer's specified.

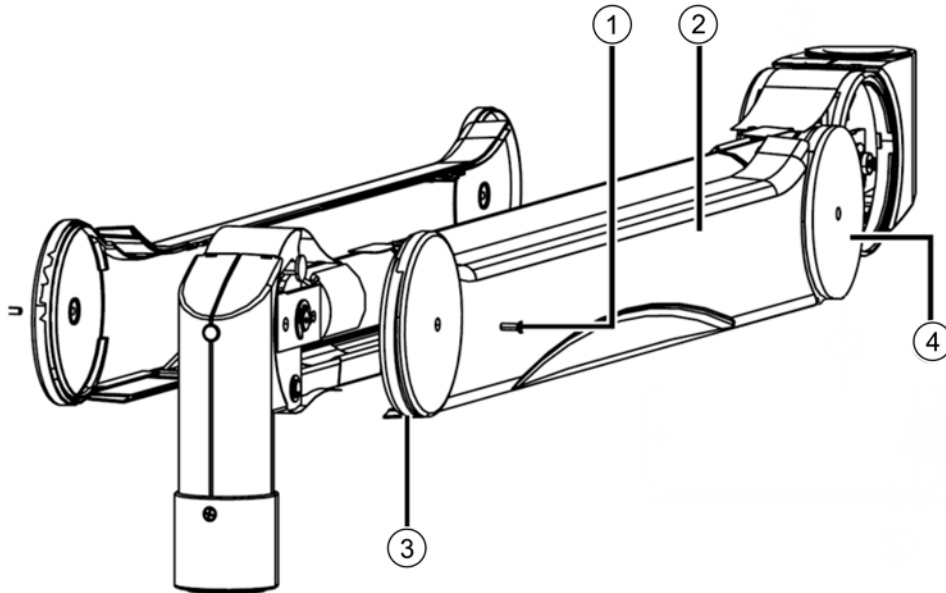
Setting the vertical stop:

☞ Setting the height limit: LC spring arm (ceiling and wall variant only)



5 Adjustments

5.1 Mount the spring arm shells on the spring arm (ceiling variant only)



The spring arm shell (2) has one flatter and one thicker decorative cap. During assembly, the thicker decorative cap (4) must be mounted at the rear joint, while the flatter decorative cap (3) must be mounted at the front joint.

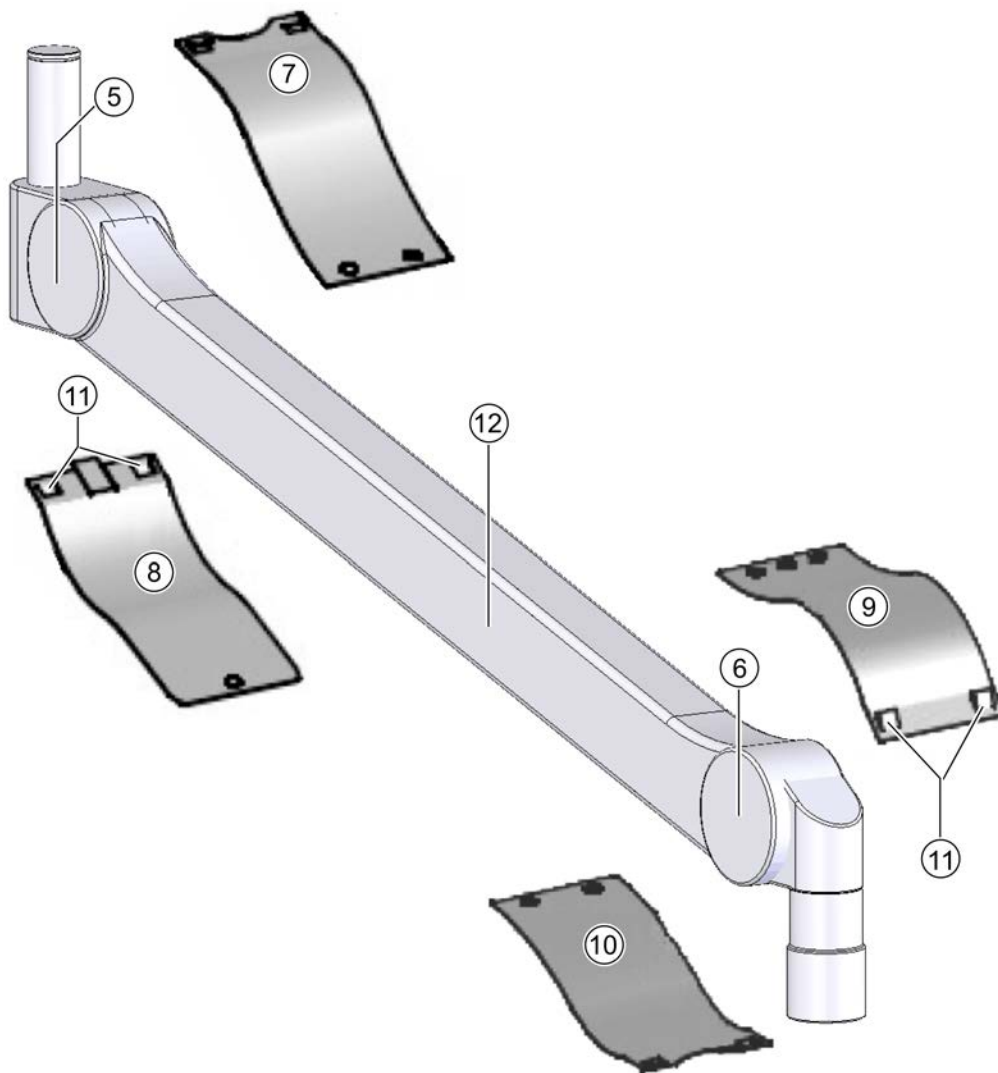
- ☞ Place one spring arm shell (2) on each spring arm side, lock them together, and screw on using two crosshead countersunk screws with M3 x 10 mm (1).
- ☞ Check the spring arm shells (2) for a secure fit.

Adjustments

5.1.1 Mounting the cover sheets

Cover sheets (7 - 10) must be fitted on both spring arm joints (5, 6).

There are 3 different cover sheets (7 - 10). Of these, (7) and (10) are identical; each fits perfectly into its intended position. The notches (11) on each sheet must always point toward their corresponding joint (5, 6); they must point away from the spring arm (12).



⚠ WARNING



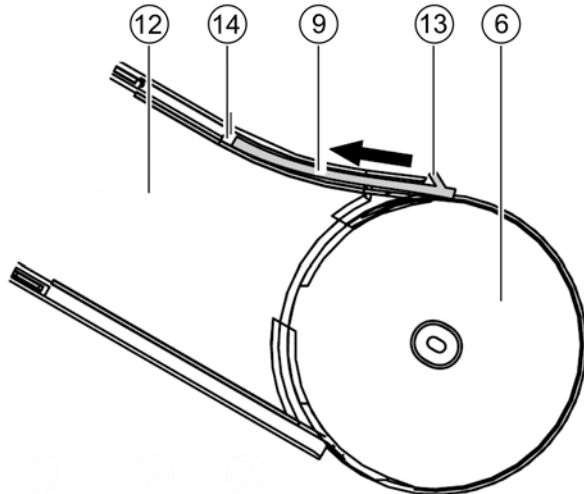
Risk of injury from a snapping-up spring arm

If the spring arm is not affixed, it could snap up and cause severe injuries!

☞ In order to mount sheets (7) and (10), place the spring arm in the position shown in the illustration. The spring arm must be affixed in this position if the end device has not yet been mounted. If the end device is present, the spring arm will automatically remain in the forward-inclined position.

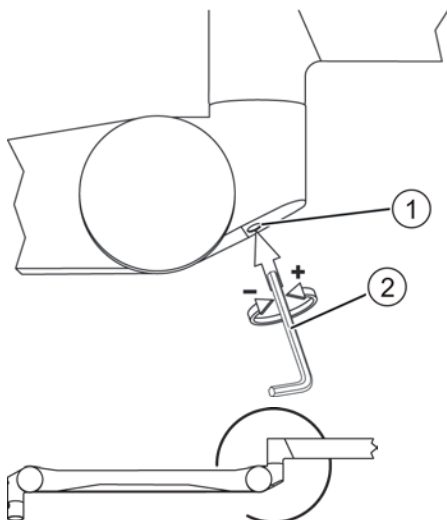
NOTICE

If the cover sheet is not positioned correctly, it could be heavily bent and destroyed as a result.



- ☞ First, insert the side of the cover sheet (9) that has no notches (13), in the direction of the arrow into the spring arm's (12) guide (14).
- ☞ Then, slide the other side with notches (13) into the joint's (6) guide, until the notches snap audibly in place.

5.2 Setting the spring force: Ceiling variant



The spring arm is equipped with an adjustable spring in order to balance the weight of the light head. If the spring arm moves out of its set position after positioning, the spring force must be readjusted.

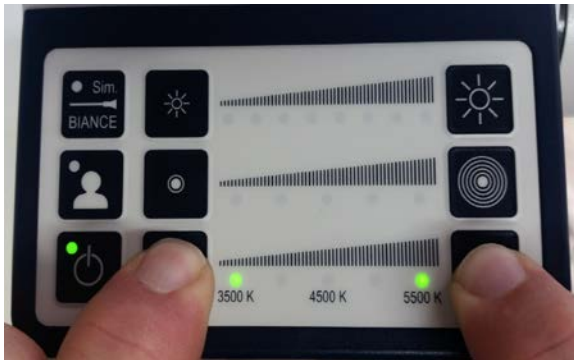
- ☞ Insert the Allen key SW 5 (2) into the adjustment opening (1) on the spring arm.
- ☞ Place the spring arm in the middle position.
- ☞ Release the spring arm.
- ☞ If the spring arm drops, the spring force has been set too low. In this case, turn the Allen key SW 5 in the direction of the plus symbol. If the spring arm rises, the spring force has been set too high. In this case, turn the Allen key in the direction of the minus symbol.
- ☞ Adjust the spring force by turning the Allen key SW 5 (2) in the plus or minus direction.

Adjustments

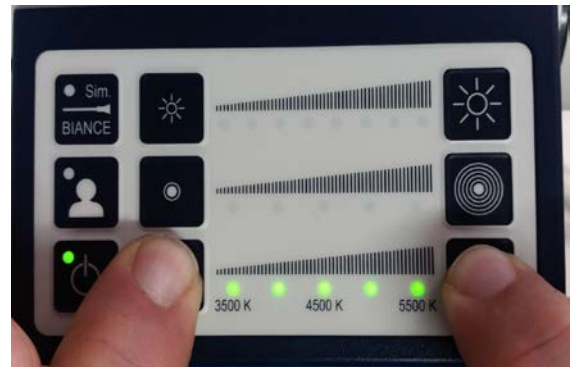
5.3 Synchronisation of colour temperature and Sim.Bianche (for Sim.Interface, for MC lights only)

Synchronisation status:

- Push the plus and minus buttons simultaneously



2 LEDs flashing – synchronisation is deactivated



5 LEDs flashing – synchronisation is activated

Activating/deactivating synchronisation:



Deactivating synchronisation:

Push the colour temperature plus and minus buttons simultaneously with the intensity plus minus

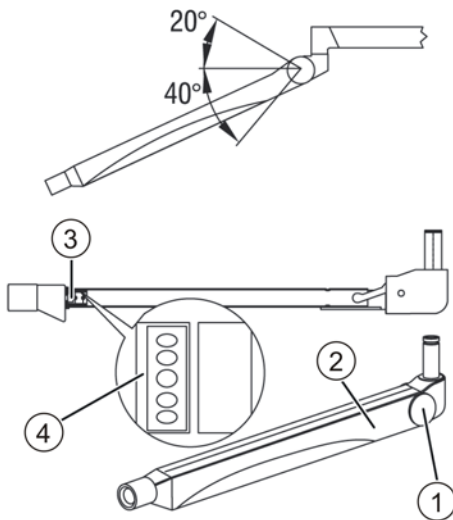


Activating synchronisation:

Push the colour temperature plus and minus buttons simultaneously with the intensity plus button

For synchronising the colour temperature, all relevant lights (MC only) must be activated in order to use this function.

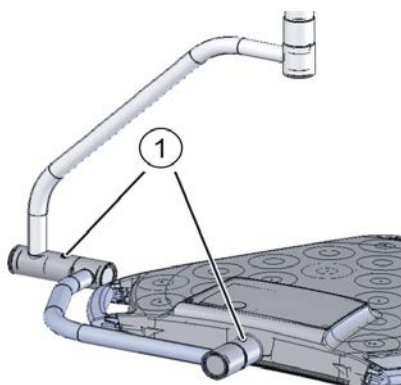
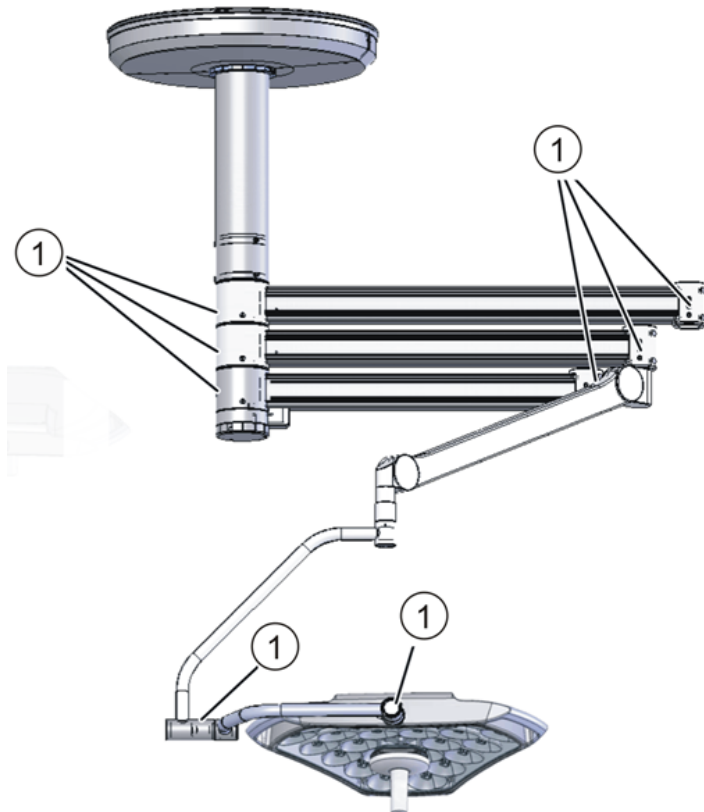
5.4 Setting the height limit: LC spring arm (ceiling and wall variant only)



- ☞ Disconnect the power supply.
- ☞ Unscrew the Phillips screws (1) on the two opposing sides.
- ☞ Remove the panelling (2).
 - ⇒ The height limit can be restricted up to a horizontal position.
 - ⇒ In order to set the height limit using the hole matrix, move the spring arm toward the floor until the hole matrix becomes visible.
- ☞ Using the enclosed metal pin, insert adjusting nuts (4) through the adjustment opening (3) in such a manner that the spring arm achieves the desired height limit.
- ☞ Mount the panelling □(2).
- ☞ Screw in the 2 Phillips screws (1) on the two opposing sides.
- ☞ Check the panelling (2) for a secure fit.

5.5 Setting the braking power

The component's joints possess brake screws (1) for setting the braking force. If the unit is too tight or too loose when moved into different positions, the braking power needs to be readjusted. Readjustment is also necessary if the extension arm needs to be extended from a resting position.



- ☞ Insert the SW4 Allen key into the adjustment opening (1) of the brake screw to be adjusted.
- ☞ Turn the brake screw in a clockwise direction, using the Allen key, to increase the braking power. Turn the brake screw counterclockwise to decrease it.
- ☞ Remove the Allen key from the adjustment opening.

6 Confirmation of static bearing capacity

Executing company or structural engineer (name and address):

Construction project (address and treatment room):

Surgical light/light combination/wall bracket/OP room:

Fastening of surgical lights:

According to construction drawing no.:	
Concrete strength class:	
Alternative material ceiling/wall:	
Thickness of ceiling/wall in cm:	

Stud bolts or alternative product according to structural engineer's specifications:

Manufacturer:	
Description:	
Size/dimensions:	
Approval number:	
Permissible load for tensile zone in N:	
Required axis centre distance in mm: (Consider reduction in load according to approval!)	
Tightening torque in Nm:	
Minimum borehole depth in mm:	
Minimum anchoring depth in mm:	
Quantity:	

Confirmation of static bearing capacity



PUSHING TECHNOLOGY TO EXCELLENCE

Date	Customer	Date	Installer



PUSHING TECHNOLOGY TO EXCELLENCE

7 Installation report

Surgical lights:

Room / OR No.:	Serial numbers, product:
Customer:	Company:

Ceiling structure	OK	Not OK	N/A
Visual inspection			
Inspect ceiling construction			
Torque, stud bolts	Nm		
Torque, suspended ceiling construction	Nm		
Ceiling tube screw connection	Nm		
Check locking element Spring arms and lights			
Completeness of surgical lights			
Inspect the electrical cables, connections and power supply connectors			

Electrical inspection of fixed installation according to DIN EN 62353:2008-08		measured	OK, not OK, N/A
Grounding conductor resistance light combination	< 0.300 Ω Brazil: < 0.100 Ω	Ω	
Touch current on protection class 2	< 500 μA	μA	

Electrical inspection of mobile installation according to DIN EN 62353:2008-08		measured	OK, not OK, N/A
Ground connection resistance light combination	< 0.300 Ω Brazil: < 0.100 Ω	Ω	
Unit leakage current	< 100 μA	μA	
Touch current on protection class 2	< 500 μA	μA	

Mobile light stand		OK	Not OK	N/A
All screws				
Connection light/spring arm and spring arm/central axis		OK	Not OK	N/A
Safety piece locked with screw				
Check the locking rings for safe positioning				
Light		OK	Not OK	N/A
Function control in accordance with Instructions for Use				
Illuminated field				
MC: Colour selection				
MC: Synchronisation				
Illumination intensity	Target:	Actual:		
Lighting voltage under no-load conditions	Target:	Actual:		
Lighting voltage at rated load	Target:	Actual:		

Installation report

O.K.	<input type="checkbox"/>	No faults. The surgical light may be operated further.
Not O.K.	<input type="checkbox"/>	The surgical light may not be further operated.
Not O.K.	<input type="checkbox"/>	The surgical light may be further operated despite the fault. A deadline to rectify the fault has been agreed upon.

Testing equipment used (ID No.)

Note

Date	Customer	Date	Installer

8 Technical data

8.1 Technical data Sim.LED 5000 SC

Data 5000 SC	Description	Values
General information	Weight of the light head [kg]	15
	Lamp lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 42
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 – 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Current consumption, maximum [A]	5.4
	Current consumption, average [A]	2.5
	Rated power [W]	66
Technical light values	Illumination intensity EC at distance of 1 meter [klx]	140
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 280
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	100
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen, reference to EC [%]	66
	Residual illumination intensity with shading from 2 screen, reference to EC [%]	60
	Residual illumination intensity in standardised lens barrel, reference to EC [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	65
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	61

Technical data

Data 5000 SC	Description	Values
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) [mm]	1,200
	Total illumination strength at 100,000 lx [W/m^2]	400
	Colour temperature [K]	4,500
	Illumination strength/illumination intensity [lm/W]	290
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.2 Technical data Sim.LED 7000 SC

Data 7000 SC	Description	Values
General information	Weight of the light head [kg]	18
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 42
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 – 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Current consumption, maximum [A]	5.4
	Current consumption, average [A]	2.5
	Rated power [W]	66
Technical light values		
	Illumination intensity EC at distance of 1 meter [klx]	160
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 300

Data 7000 SC	Description	Values
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	100
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen, reference to EC [%]	81
	Residual illumination intensity with shading from 2 screens, reference to EC [%]	65
	Residual illumination intensity in standardised lens barrel, Reference to EC [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	80
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	64
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) [mm]	1,100
	Total illumination strength at 100,000 lx [W/m^2]	515
	Colour temperature [K]	4,500
	Illumination strength/illumination intensity [lm/W]	290
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.3 Technical data Sim.LED 5000 MC

5000 MC data	Description	Values
General information		
	Weight of the light head [kg]	15
	Lamp lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 42
Connection values		
	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 – 60

Technical data

5000 MC data	Description	Values
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Current consumption, maximum [A]	5.4
	Current consumption, average [A]	2.5
	Rated power [W]	50
Technical light values		
	Illumination intensity EC at distance of 1 meter [klx]	140
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 280
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	100
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen, reference to EC [%]	66
	Residual illumination intensity with shading from 2 screens, reference to EC [%]	60
	Residual illumination intensity in standardised lens barrel, reference to EC [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	65
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	61
	Colour rendering index R_a	96
	Red rendering index	94
	Illumination depth (L1/L2) [mm]	1,200
	Total illumination strength at 100,000 lx [W/m^2]	400
Colour temperature [K]	3,500, 4,000, 4,500, 5,000, 5,500	
Illumination strength/illumination intensity [lm/W]	290	
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

Technical data

8.4 Technical data Sim.LED 7000 MC

7000 MC data	Description/designation	Values
General information	Weight of the light head [kg]	18
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 42
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 – 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Current consumption, maximum [A]	5.4
	Current consumption, average [A]	2.5
	Rated power [W]	60
Technical light values	Illumination intensity EC at distance of 1 meter [klx]	160
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 300
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	100
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen, reference to EC [%]	81
	Residual illumination intensity with shading from 2 screens, reference to EC [%]	65
	Residual illumination intensity in standardised lens barrel, reference to EC [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	80
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	64
	Colour rendering index R _a	96
	Red rendering index	94

7000 MC data	Description/designation	Values
	Illumination depth (L1/L2) [mm]	1,100
	Total illumination strength at 100,000 lx [W/m^2]	515
	Colour temperature [K]	3,500, 4,000, 4,500, 5,000, 5,500
	Illumination strength/illumination intensity [lm/W]	290
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.1 Technical data Sim.LED 450 SC

450 SC data	Description	Values
General information	Weight of the light head [kg]	13
	Lamp lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Rated power [W]	45
	Protection class acc. to IEC 60601	I
Technical light values	Illumination intensity EC at distance of 1 metre [klux]	120
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	160 – 250
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	84
	Field adjustment	yes

Technical data

450 SC data	Description	Values
	Residual illumination intensity with shading from 1 screen [%]	32
	Residual illumination intensity with shading from 2 screens [%]	42
	Residual illumination intensity in standardised lens barrel [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	33
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	42
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) at 20 % intensity [mm]	975
	Illumination depth (L1/L2) at 60 % intensity [mm]	470
	Total illumination strength [W/m^2]	268
	Colour temperature [K]	4,500
	Illumination strength/illumination intensity [lm/W]	511
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.2 Technical data Sim.LED 500 SC

500 SC data	Description/designation	Values
General information	Weight of the light head [kg]	15
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Rated power [W]	53
	Protection class acc. to IEC 60601	I

500 SC data	Description/designation	Values
Technical light values	Illumination intensity EC at distance of 1 meter [klux]	140
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 290
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	98
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen [%]	69
	Residual illumination intensity with shading from 2 screens [%]	42
	Residual illumination intensity in standardised lens barrel [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	68
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	42
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) at 20 % intensity [mm]	930
	Illumination depth (L1/L2) at 60 % intensity [mm]	460
	Total illumination strength [W/m^2]	268
	Colour temperature [K]	4,500
	Illumination strength/illumination intensity [lm/W]	519
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.3 Technical data Sim.LED 700 SC

Data 700 SC	Description/designation	Values
General information	Weight of the light head [kg]	18
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52

Technical data

Data 700 SC	Description/designation	Values
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Rated power [W]	622
	Protection class acc. to IEC 60601	I
	Technical light values	Illumination intensity EC at distance of 1 meter [klux]
Electronic brightness regulation [%]		30 – 100
d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]		180 – 300
d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]		101
Field adjustment		yes
Residual illumination intensity with shading from 1 screen [%]		67
Residual illumination intensity with shading from 2 screen [%]		47
Residual illumination intensity in standardised lens barrel [%]		97
Residual illumination intensity with 1 lens barrel and 1 screen [%]		64
Residual illumination intensity with 1 lens barrel and 2 screens [%]		45
Colour rendering index R_a		96
Red rendering index		96
Illumination depth (L1/L2) at 20 % intensity [mm]		875
Illumination depth (L1/L2) at 60 % intensity [mm]		420
Total illumination strength [W/m^2]		312
Colour temperature [K]		4,500
Illumination strength/illumination intensity [lm/W]		516
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.4 Technical data Sim.LED 450 MC

Data 450 MC	Description	Values
General information	Weight of the light head [kg]	13
	Lamp lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52
Connection values	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Rated power [W]	51
	Protection class acc. to IEC 60601	I
Technical light values	Illumination intensity EC at distance of 1 metre [klux]	120
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	160 – 230
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	88
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen [%]	36
	Residual illumination intensity with shading from 2 screen [%]	37
	Residual illumination intensity in standardised lens barrel [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	35
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	44
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) at 20 % intensity [mm]	925

Technical data

Data 450 MC	Description	Values
	Illumination depth (L1/L2) at 60 % intensity [mm]	510
	Total illumination strength [W/m ²]	230
	Colour temperature [K]	3,500, 4,000, 4,500, 5,000, 5,500
	Illumination strength/illumination intensity [lm/W]	517
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.5 Technical data Sim.LED 500 MC

Data 500 MC	Description/designation	Values
General information		
	Weight of the light head [kg]	15
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52
Connection values		
	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24
	Rated power [W]	622
Protection class acc. to IEC 60601	I	
Technical light values		
	Illumination intensity EC at distance of 1 meter [klux]	140
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 290
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	105
	Field adjustment	yes

Data 500 MC	Description/designation	Values
	Residual illumination intensity with shading from 1 screen [%]	65
	Residual illumination intensity with shading from 2 screen [%]	44
	Residual illumination intensity in standardised lens barrel [%]	100
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	65
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	44
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) at 20 % intensity [mm]	945
	Illumination depth (L1/L2) at 60 % intensity [mm]	495
	Total illumination strength [W/m ²]	274
	Colour temperature [K]	3,500, 4,000, 4,500, 5,000, 5,500
	Illumination strength/illumination intensity [lm/W]	518
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

8.6 Technical data Sim.LED 700 MC

Data 700 MC	Description/designation	Values
General information		
	Weight of the light head [kg]	18
	Lifespan [h]	> 50,000
	Protection class acc. to IEC 60529-1 (light head)	IP 52
Connection values		
	Power supply unit, ceiling variant/mobile variant	
	Supply voltage AC [V]	100 – 240
	Mains frequency [Hz]	50 / 60
	Power consumption [VA]	140
	Light head	
	Voltage DC [V]	24

Technical data



Data 700 MC	Description/designation	Values
	Rated power [W]	66
	Protection class acc. to IEC 60601	I

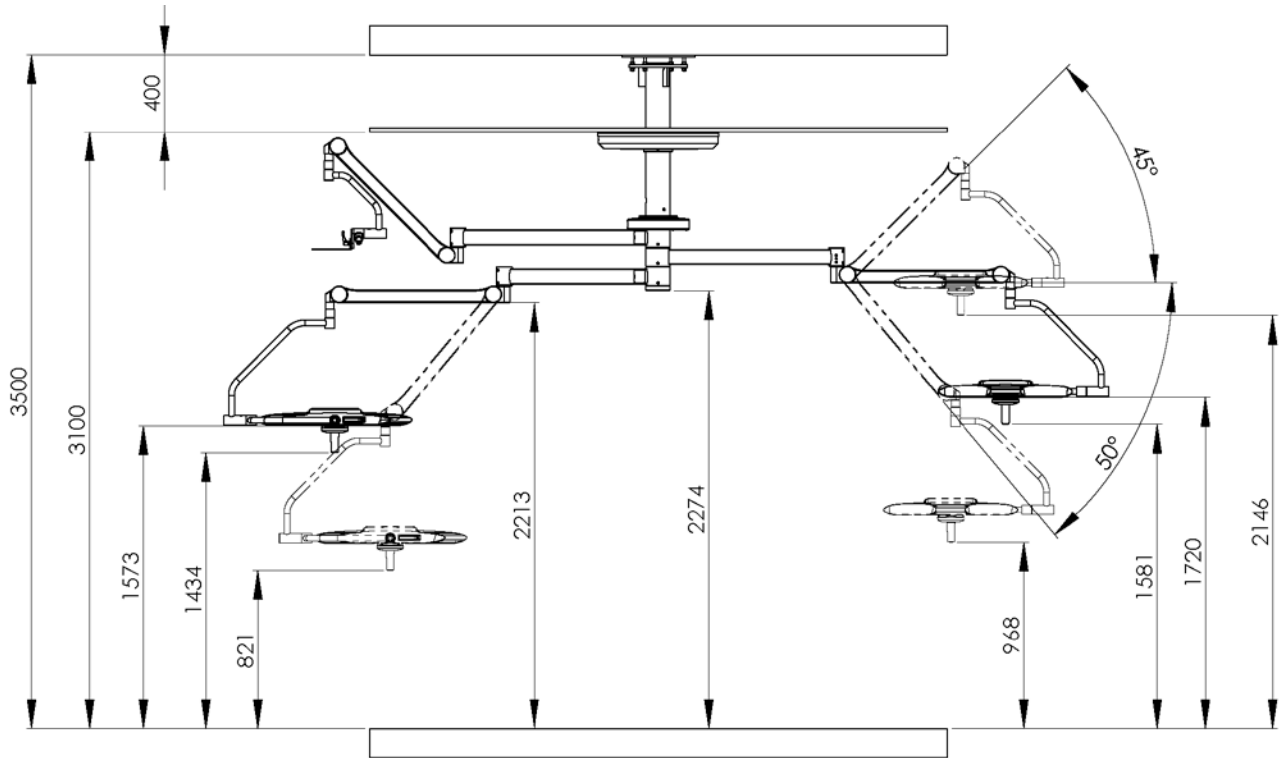
Data 700 MC	Description/designation	Values
Technical light values	Illumination intensity EC at distance of 1 meter [klux]	160
	Electronic brightness regulation [%]	30 – 100
	d10: Light field diameter at 10 % of max. illumination intensity at distance of 1 m [mm]	180 – 300
	d50: Light field diameter at 50 % of max. illumination intensity at distance of 1 m [mm]	106
	Field adjustment	yes
	Residual illumination intensity with shading from 1 screen [%]	65
	Residual illumination intensity with shading from 2 screen [%]	47
	Residual illumination intensity in standardised lens barrel [%]	97
	Residual illumination intensity with 1 lens barrel and 1 screen [%]	622
	Residual illumination intensity with 1 lens barrel and 2 screens [%]	45
	Colour rendering index R_a	96
	Red rendering index	96
	Illumination depth (L1/L2) at 20 % intensity [mm]	915
	Illumination depth (L1/L2) at 60 % intensity [mm]	450
	Total illumination strength [W/m^2]	316
	Colour temperature [K]	3,500, 4,000, 4,500, 5,000, 5,500
Illumination strength/illumination intensity [lm/W]	511	
Operating conditions	Air pressure [hPa]	700 – 1,060
	Temperature range [°C]	5 – 40
	Relative air humidity, maximum [%]	95

We reserve the right to make technical changes; tolerance $\pm 10\%$

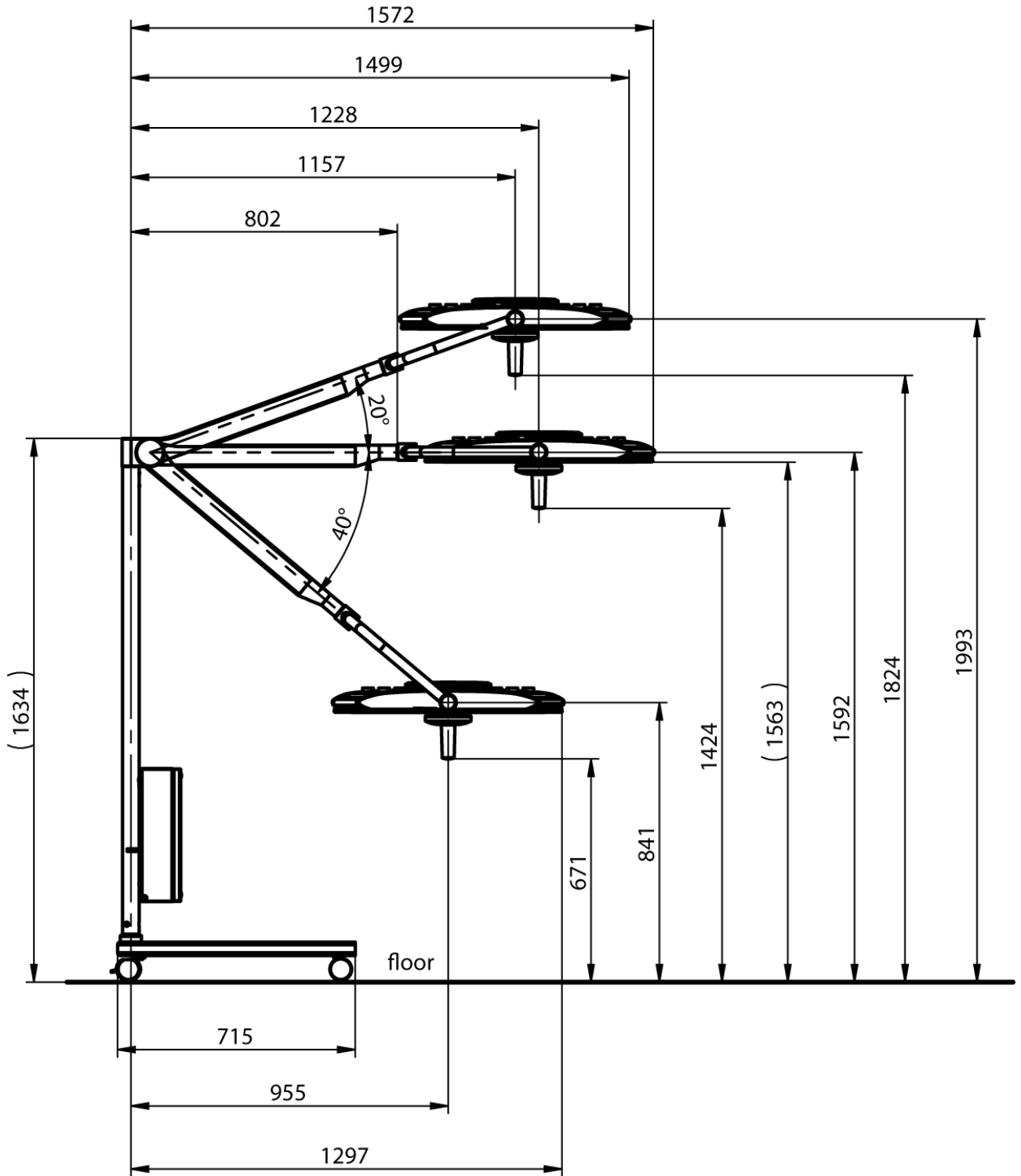
8.7 Dimension sheets

8.7.1 Sim.LED 5000/7000 ceiling variant

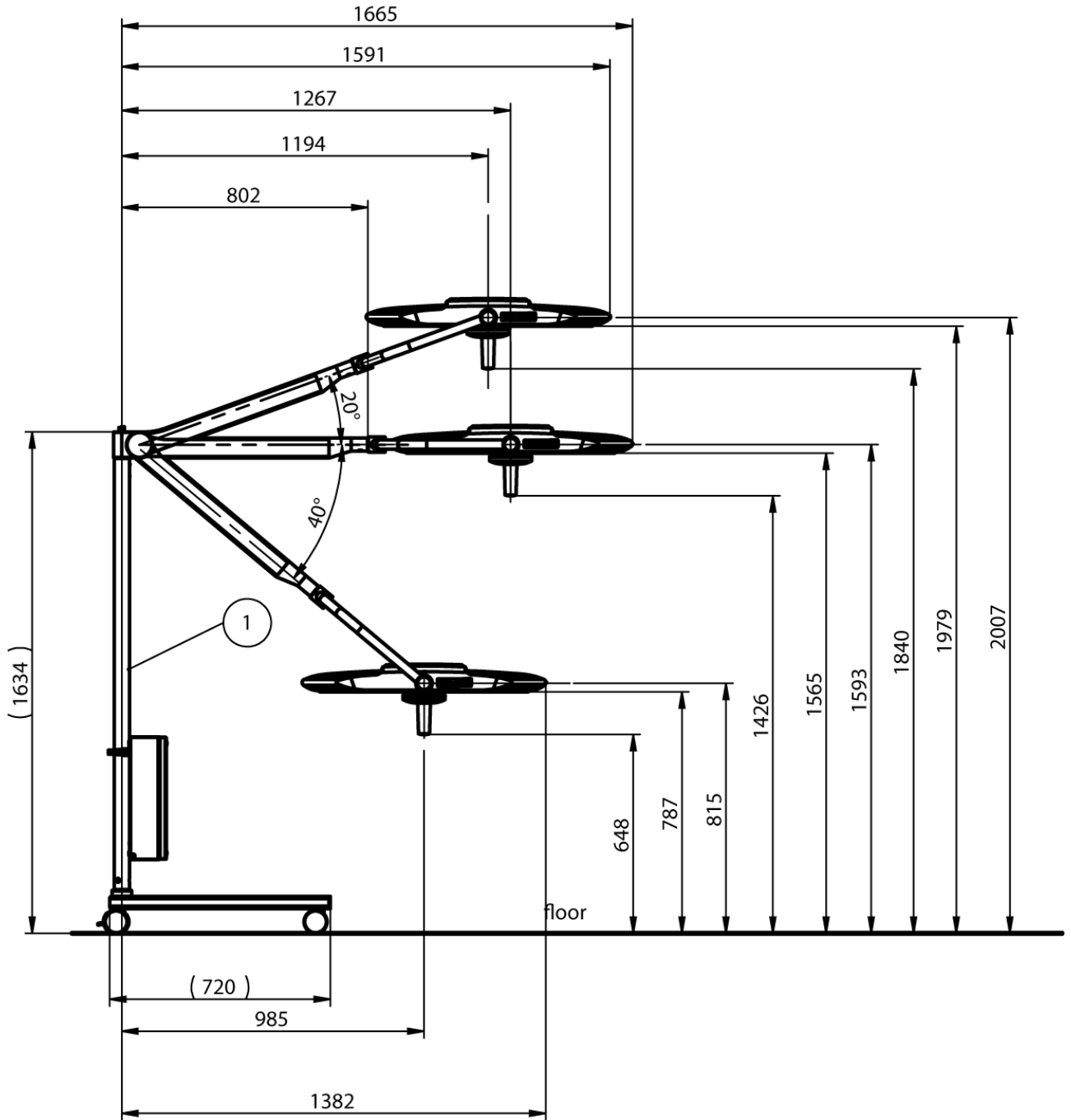
The Sim.LED 5000 and 7000 are identical in construction, the only difference is in the size of the light head.



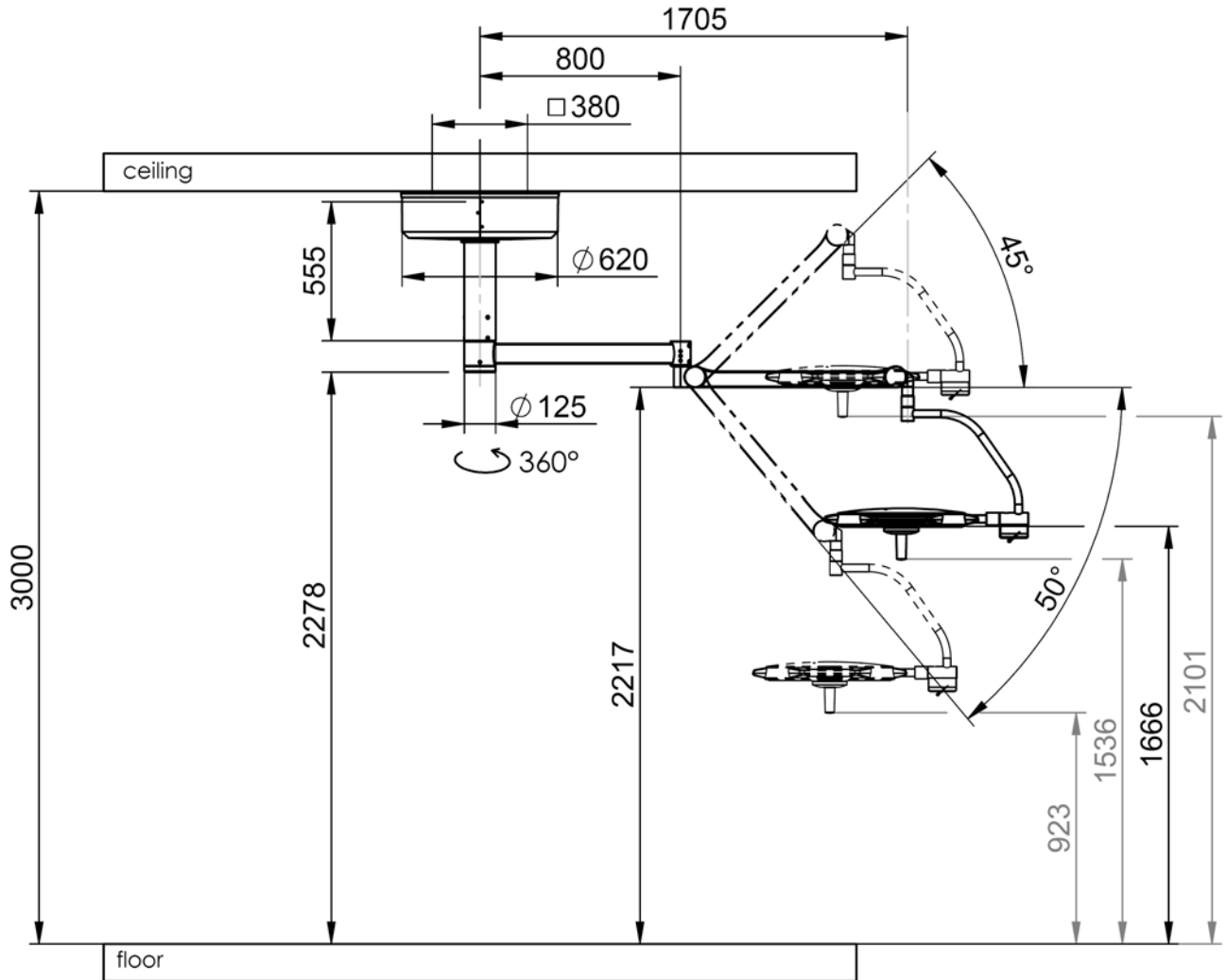
8.7.2 Sim.LED 5000 mobile variant



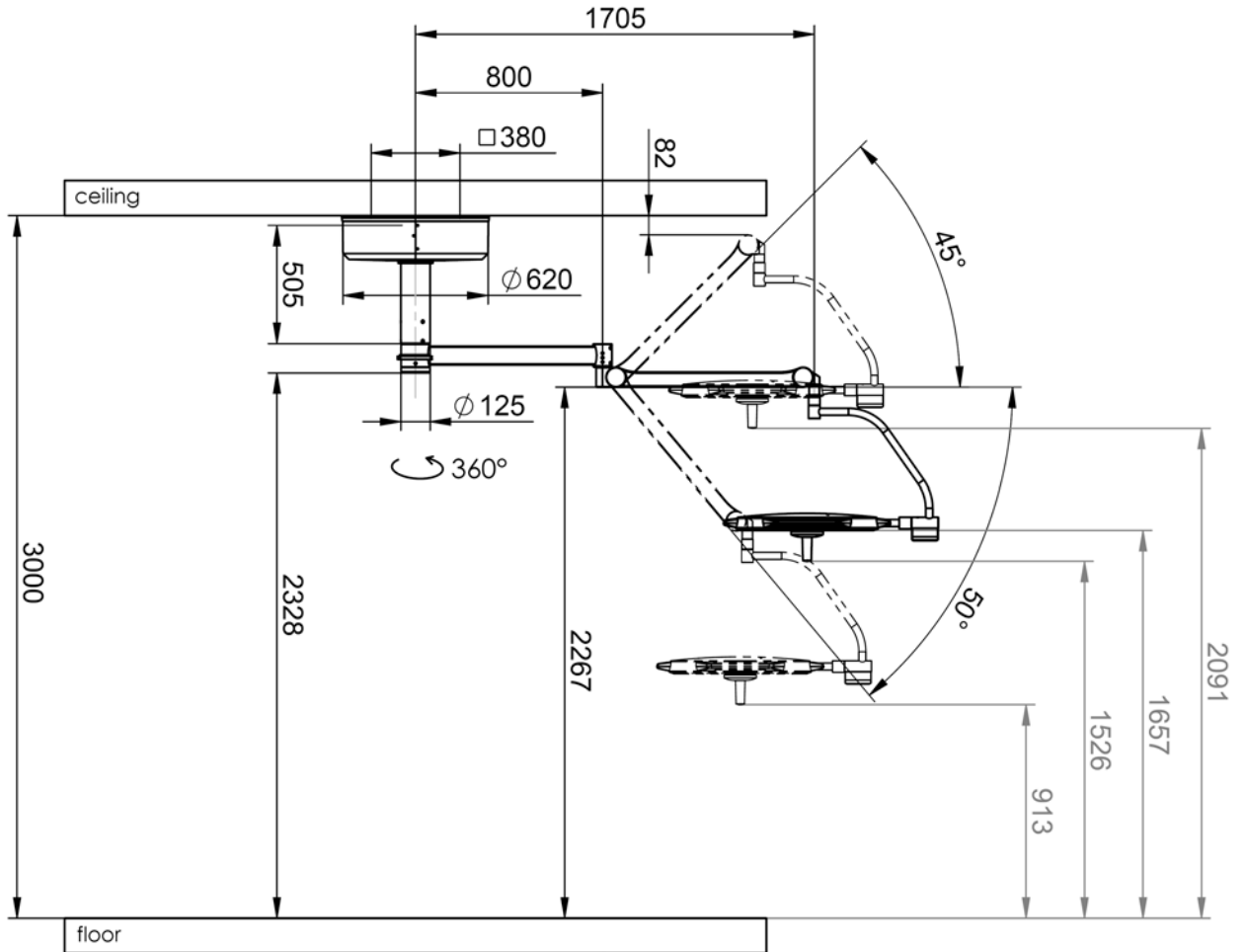
8.7.3 Sim.LED 7000 mobile variant



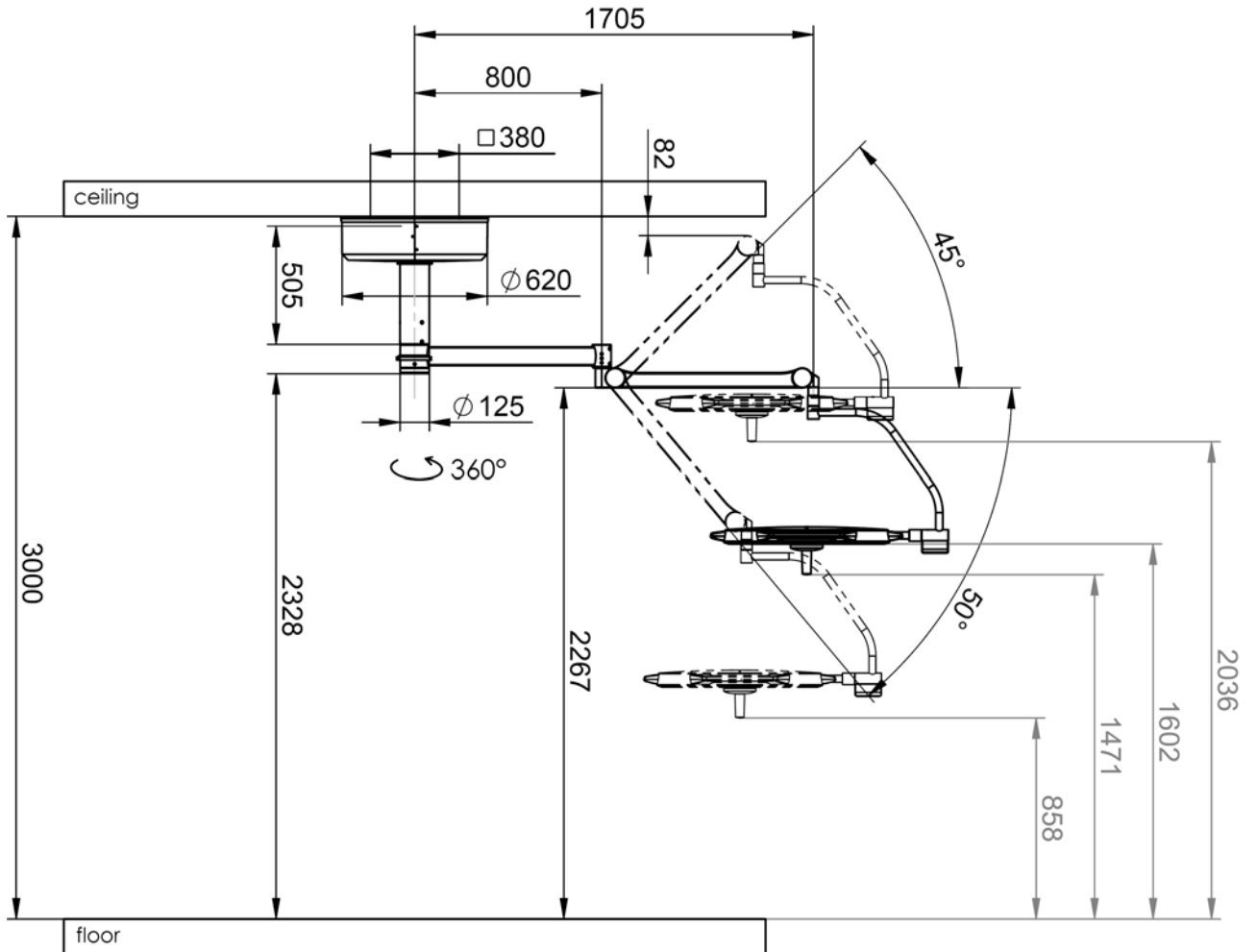
8.7.4 Sim.LED 450 ceiling variant



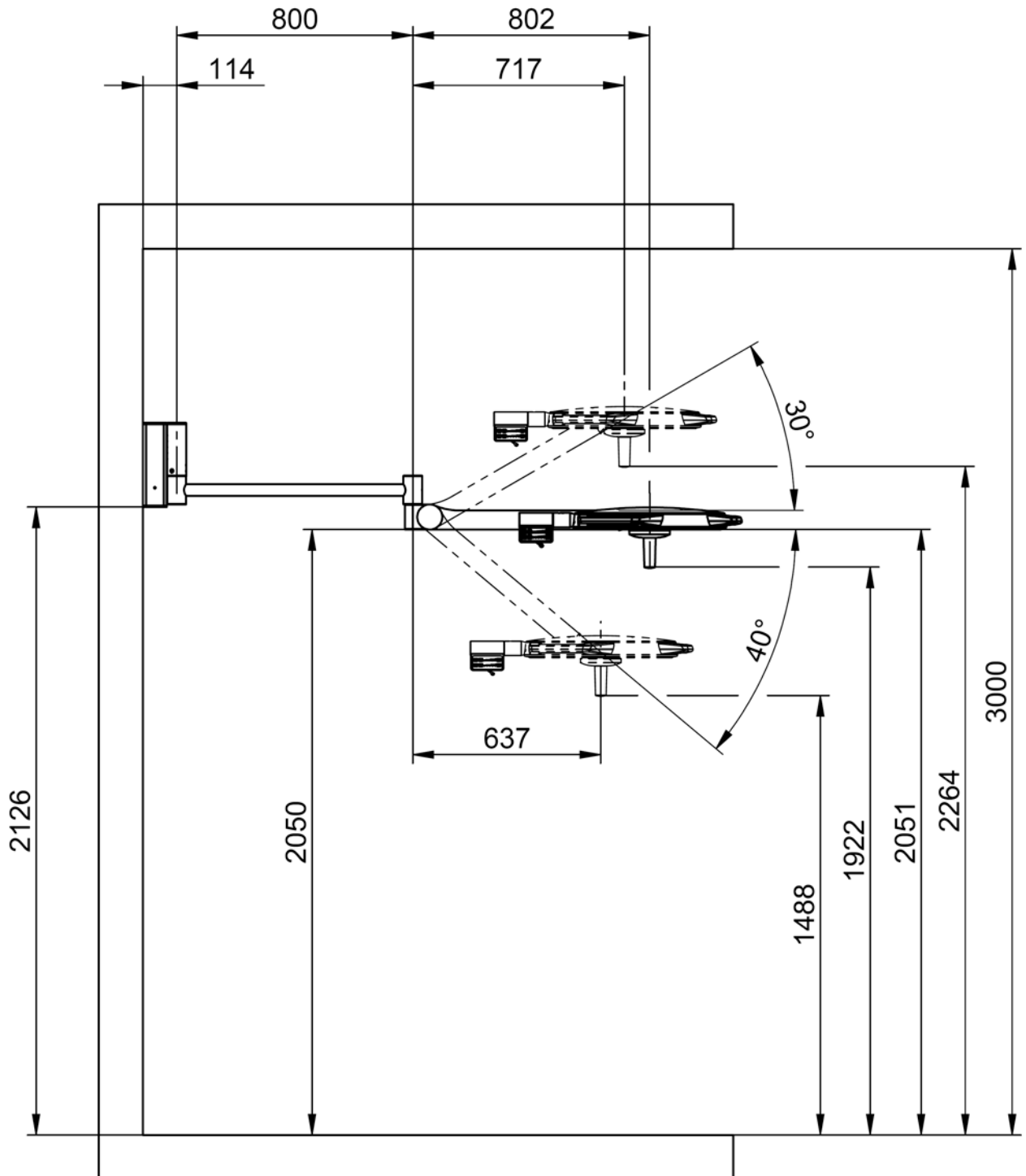
8.7.5 Sim.LED 500 ceiling variant



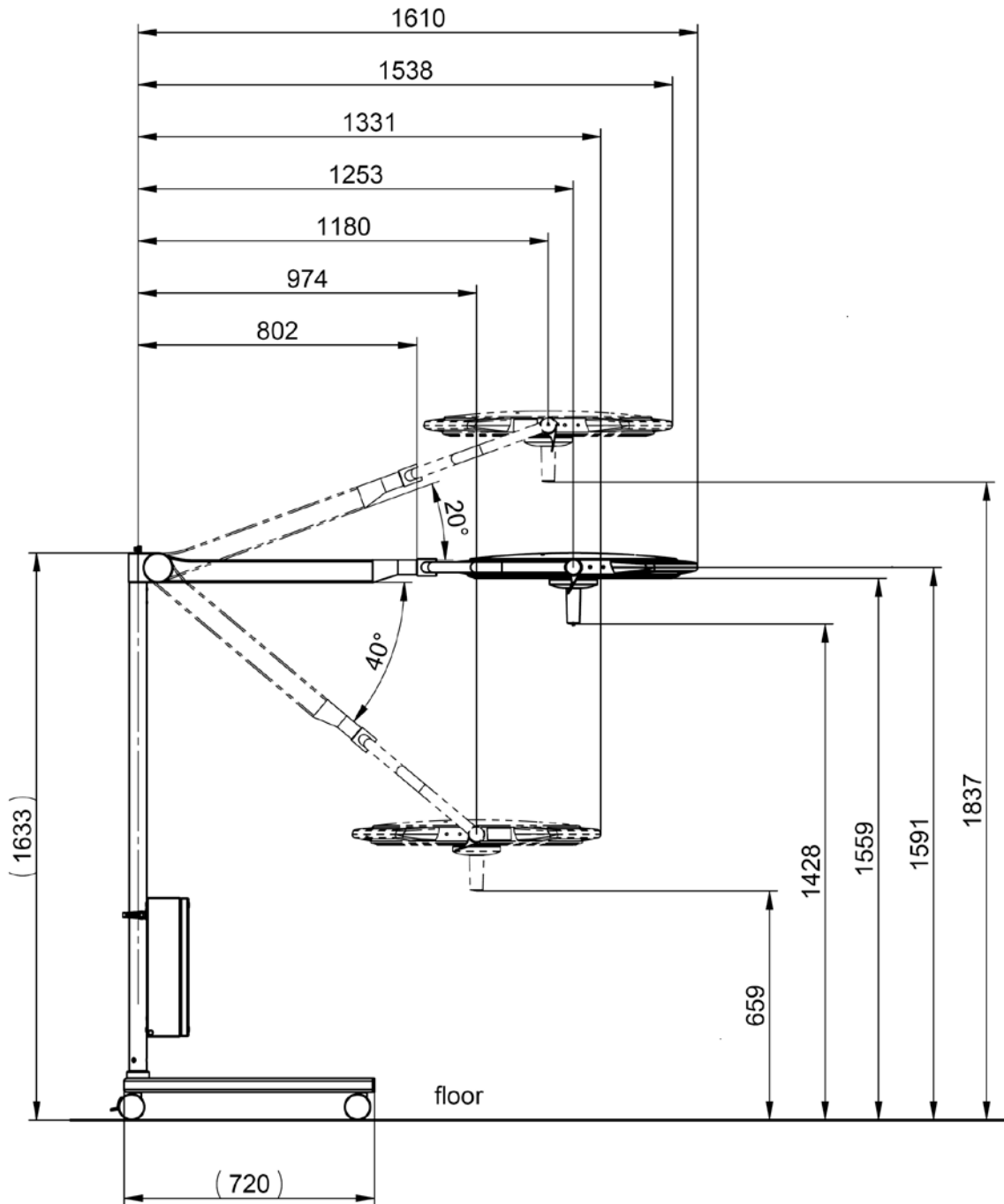
8.7.6 Sim.LED 700 ceiling variant



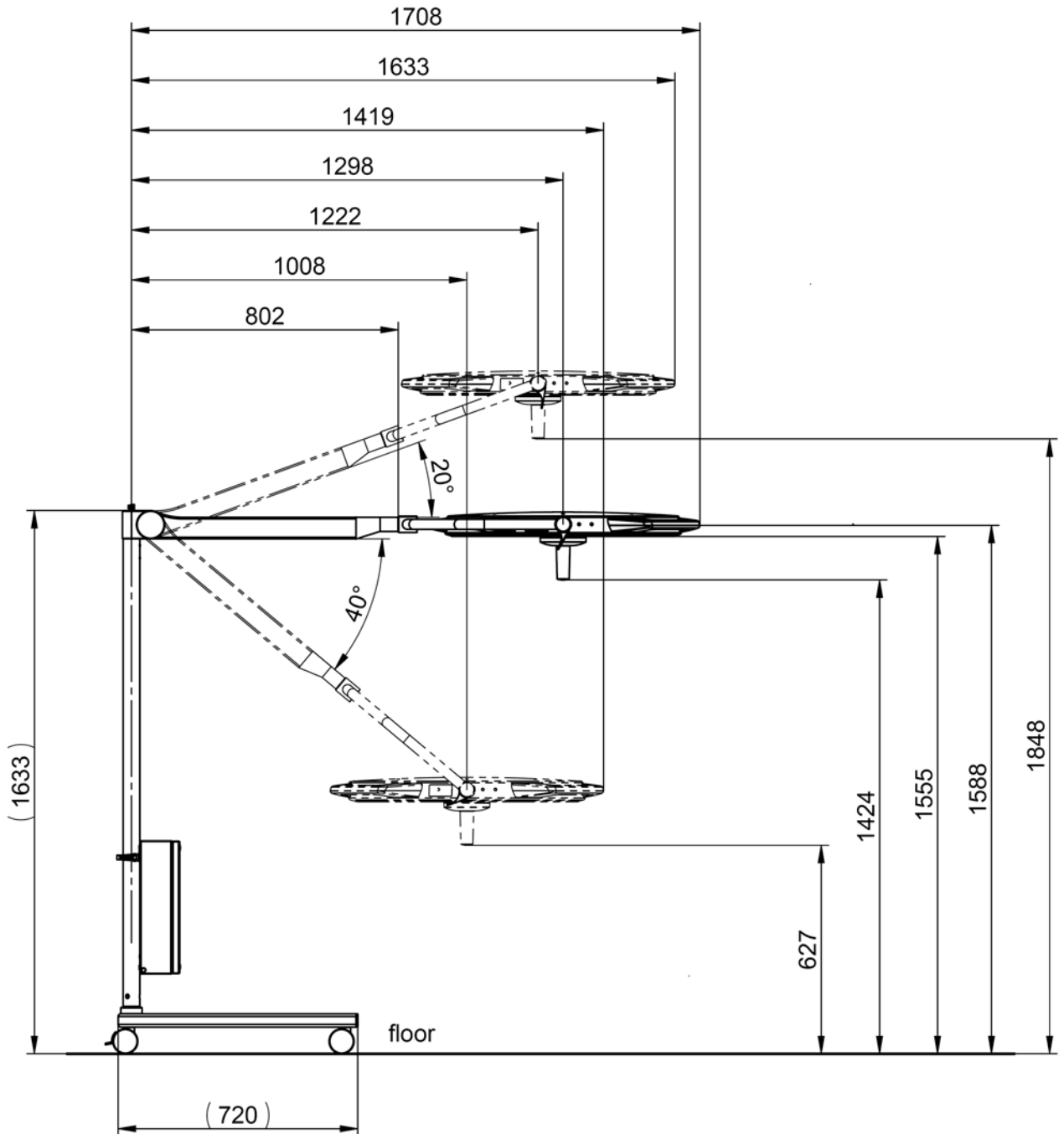
8.7.7 Sim.LED 450 wall variant



8.7.9 Sim.LED 500 mobile variant

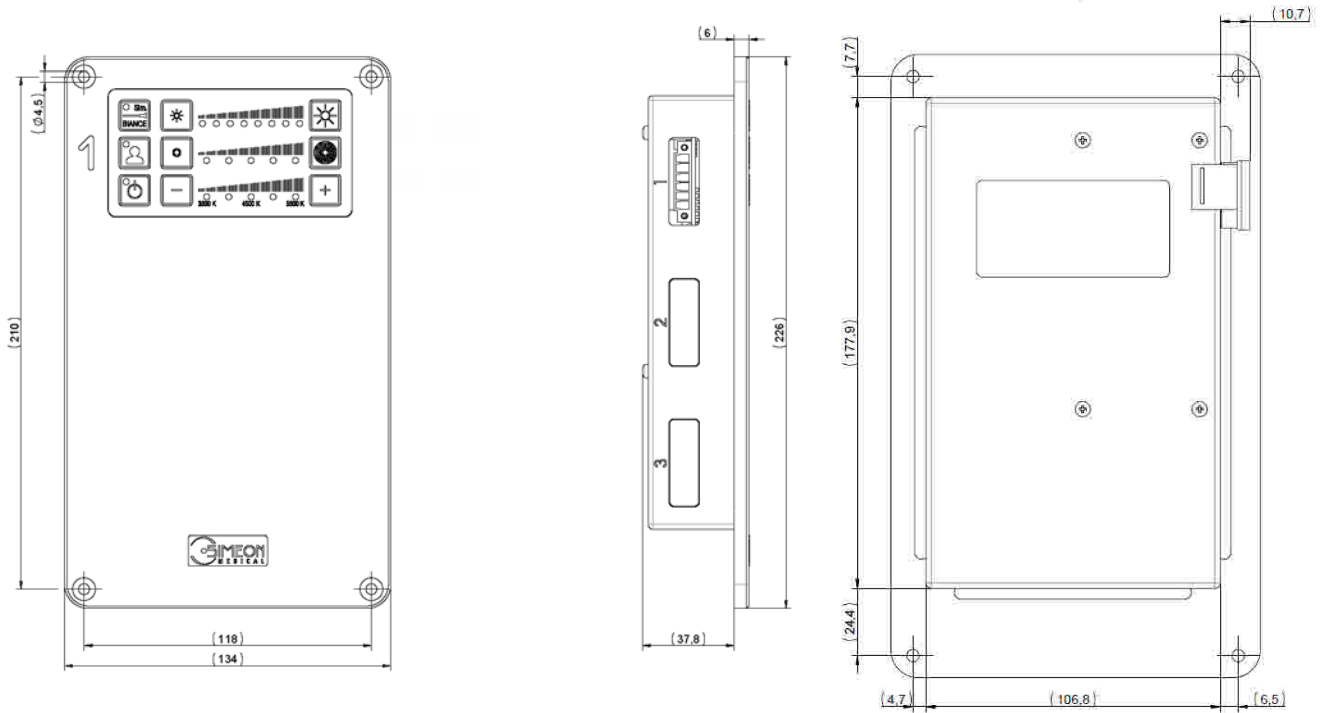


8.7.10 Sim.LED 700 mobile variant

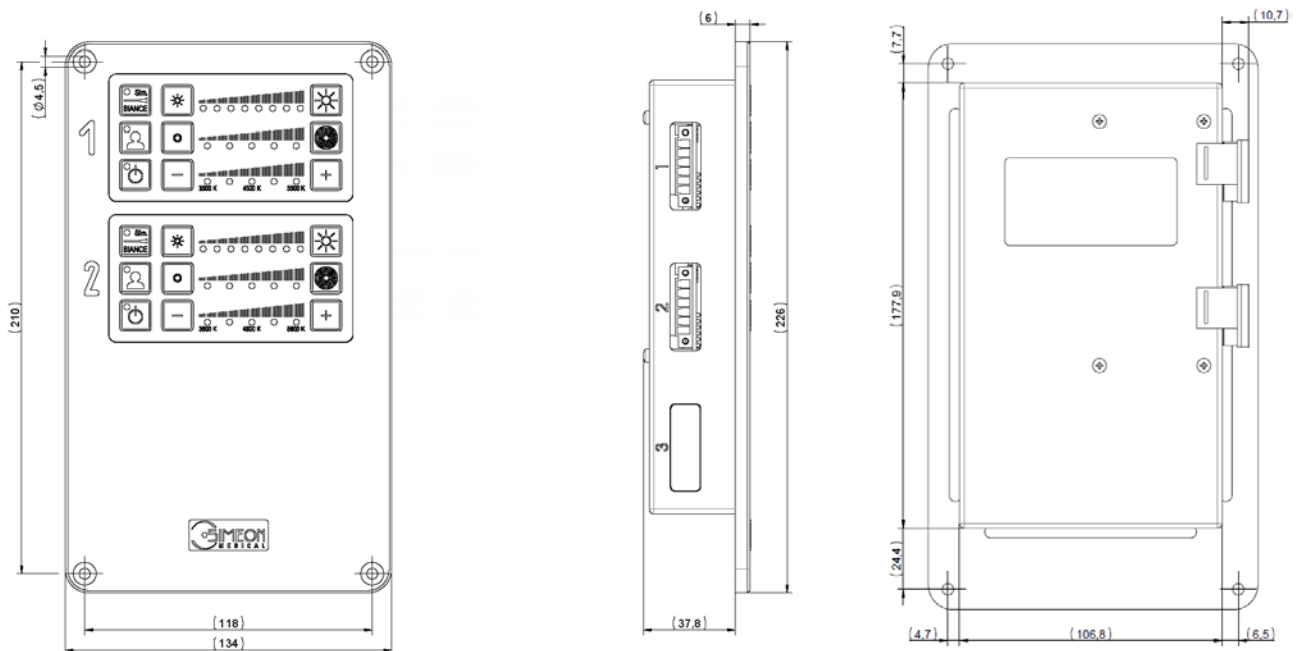


Technical data

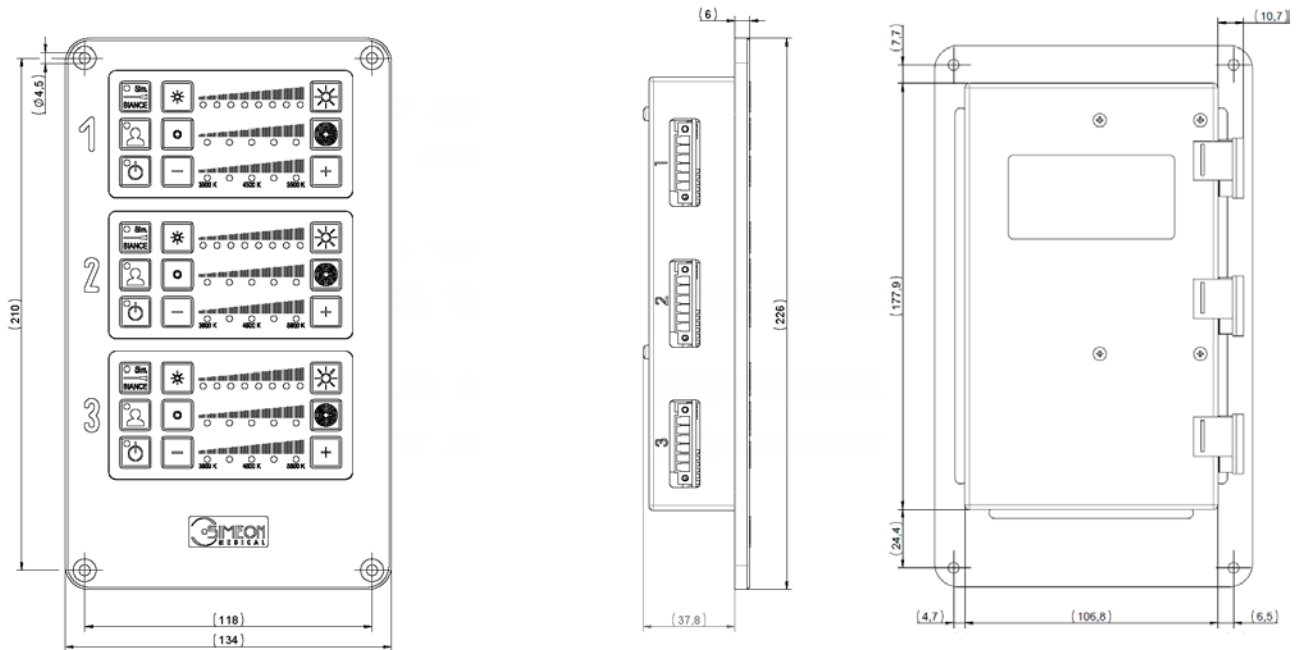
8.7.11 Wall controls, single



8.7.12 Wall control, double



8.7.13 Wall control, triple



9 Approved combinations/lengths

9.1 Approved Sim.FLEX combinations

The maximum load capacities for the spring arms are 21 kg (AC 2000), 30 kg (AC 3000) and 40 kg (OndaSpace). The permissible load capacity is reduced when combined with extension arms measuring 1,500 – 2,000 mm in length, so that a maximum of only two extension arms may be configured. If an OndaSpace spring arm is required, extension arms with a length of up to 1,250 mm may be used. When using an AC 3000 spring arm, extension arms with a length of up to 1,400 mm may be used.

The Sim.FLEX ceiling tube allows up to 4 extension arms, including a max. of 2 OndaSpace arms. These must be configured at the topmost or lowermost position.

The ceiling tube Ø 125 mm allows up to 3 extension arms, including a max. of 1 OndaSpace arm. The latter must be configured at the topmost or lowermost position.

The following limit values for the configurable lengths of the extension arms must be observed when making configuration adjustments to the Sim.FLEX system.

Sim.FLEX on a Sim.FLEX ceiling tube (max. 4 extension arms, max. 2 OndaSpace)				
Sim.FLEX on a ceiling tube approx. Ø 125 mm (max. 3 extension arms, max. 1 OndaSpace)				
Spring arm	Poss. extension arm length (mm)			
Sim.FLEX with OndaSpace spring arm up to 40 kg (double monitor mount Sim.SCREEN Double, on the topmost or lowermost position)	800	950	1,100	1,250
Sim.FLEX with AC 3000 spring arm up to 30 kg (monitor mount Sim.SCREEN Single)	800 1,400	950	1,100	1,250
Sim.FLEX with AC 2000 spring arm up to 21 kg (OR lights or monitor mount Sim.SCREEN Single)	800 1,400 1,800	950 1,500 1,900	1,100 1,600 2,000	1,250 1,700
Topmost extension arm	Poss. 2nd extension arm length (mm)			
Sim.FLEX extension arm lengths 2,000 mm or 1,900 mm	800	950	1,100	1,250
Sim.FLEX extension arm length 1,800 mm	800 1,400	950 1,500	1,100 1,600	1,250
Sim.FLEX extension arm length 1,700 mm	800 1,400	950 1,500	1,100	1,250
Sim.FLEX extension arm length 1,600 mm	800 1,400	950	1,100	1,250
Sim.FLEX extension arm length 1,500 mm	800	950	1,100	1,250

9.2 Approved combinations for standard carrier arms in conjunction with OndaSpace spring arms

Extension arm and spring arm	Poss. extension arm length (mm)			
Standard carrier arm with OndaSpace up to 40 kg	680	800		
Standard carrier arm with OndaSpace up to 32 kg	680	800	925	1,040

9.3 Approved length for Sim.LED 450 wall mounting

Only the Sim.LED 450, 3 pol. LC (with lateral outlet spring arm only) with a maximum extension arm length of 800mm is approved for wall mounting.