

Section 3: Pre-Installation Guidelines

SPECIAL NOTE: Installation and repair of this equipment should be performed by a qualified mechanical contractor only. Medical Illumination does not warranty any damage occurring as a result of improper installation.

It is recommended that this installation manual be completely reviewed prior to installation.

Before installation, check to ensure the following minimum conditions are provided:

- The structural ceiling mount is designed to support a vertical load of 300 lbs (triple) and an off-center moment of 960 ft-lbs, the single light is significantly less. The structural mount should meet all local building codes.



A structural mount that does not meet these minimum conditions can cause serious injury and/or property damage.



Failure to use the correct mounting hardware can cause the arm/head assembly to become unstable, causing serious injury and/or property damage. If the ceiling mounting surface is not level, shim the ceiling casting to level the assembly.



Failure to level the ceiling plate may cause unwanted arm “drifting” during use.

- It is recommended that the Power Box be mounted directly over a 4-0 junction box. If this is not possible the input power supply lines should be wired in accordance with all applicable building codes.
- The supply circuit line must be as follows:
120 VAC lights- 110-120 VAC 50/60 Hz, single phase, three wire, capable of supplying 700 watts @ 6.4 amperes.
230 VAC lights- 220-240 VAC, 50/60 Hz, single phase, three wire, capable of supplying 700 watts @ 3.2 amperes.
- The power supply circuit must be in compliance with all applicable building codes.
- It is recommended that the Lighting System is connected to its own supply circuit with integral circuit breaker. The circuit breaker will act as the supply main disconnect switch.
- The MAINS ground wire, which is green and has a ring-type terminal at the end, should be securely fastened to the mounting plate with a screw and lock washer.



Failure to provide a circuit meeting these minimum standards or complying with local building codes can cause a shock hazard.

- Check the length of the ceiling rod supplied to make sure that it is the proper length to install and operate the light without interference or over reach. See the Ceiling Rod Calculations.

Mounting Plate preparation with an Interface Plate

If you choose to use an Interface Plate in mounting your Light System, you should only use 5/8-11, A325 High Strength Threaded Rods, Hex Nuts and Washers. The following will illustrate the recommended hardware complement.

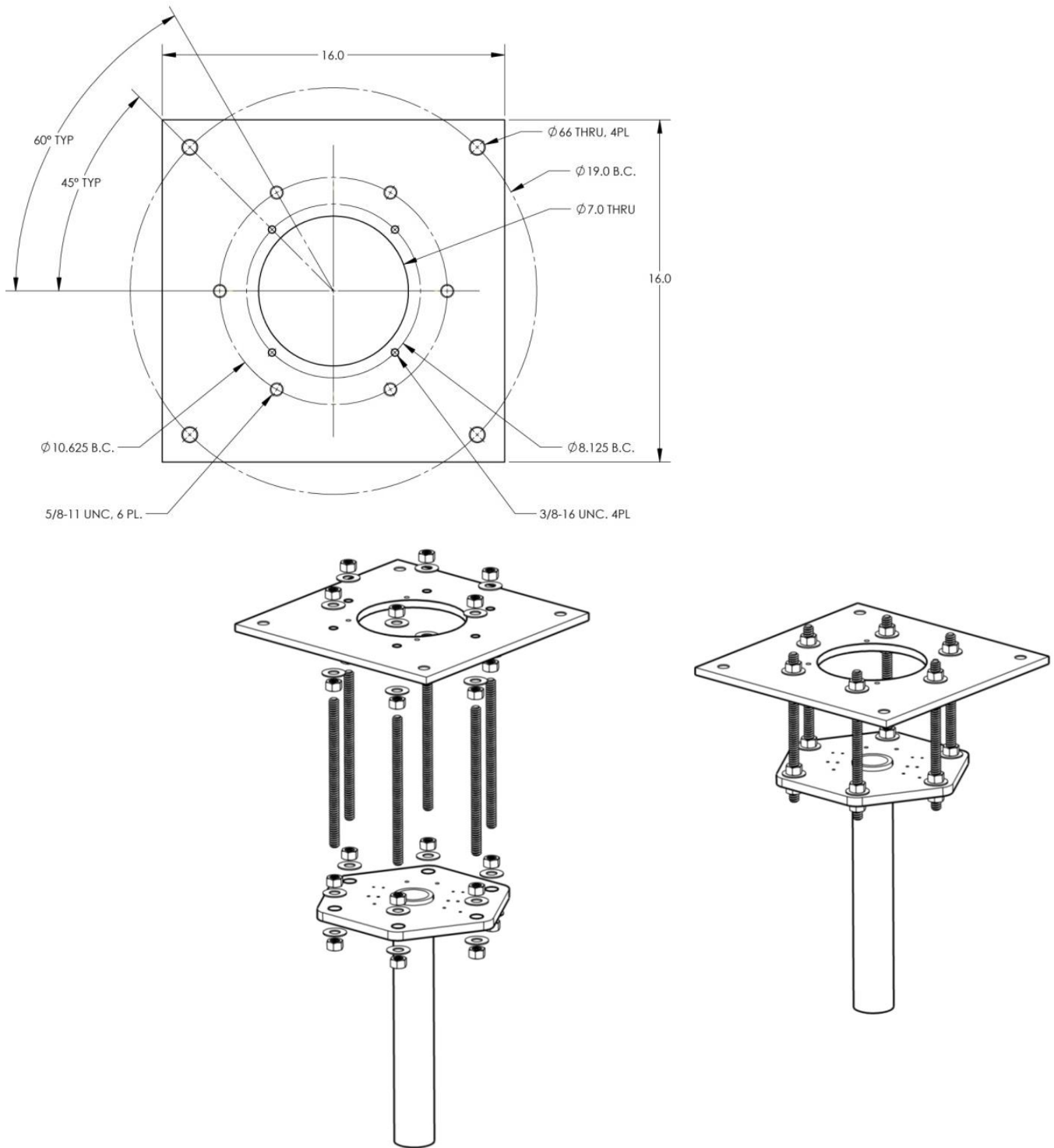


Figure 1: Ceiling Plate preparation with an Interface Plate

Ceiling Structure Construction and Mounting

The Ceiling Mount system will experience various levels of dynamic off center moment during regular use. Therefore, it is crucial that the ceiling structure be strong enough to uphold the weight of the system and support the positioning arms and light head without deflection. The owner and/or owner's contractor has the final responsibility for the strength and rigidity of the ceiling structure. An inadequate ceiling structure may result in serious injury, unintended drift, and/or equipment damage. **Because the ceiling structure is the owner's responsibility, the design and construction recommendation shown below covers only one of the many possible alternatives that can be used.** Medical Illumination highly recommends that the owner consult a structural engineer prior to designing and installing the ceiling structure.

Recommended Ceiling Structure Construction Details

The illustrations below are suggested mounting schemes per 2001 California Building Code – Section 1632A: Anchorage and Seismic. For any other mounting scheme, please consult a structural engineer and/or professional contractor for the best solution for your situation. Installation and repair of this equipment should be performed by qualified persons only. Medical Illumination does not warranty any damage occurring as a result of improper installation.

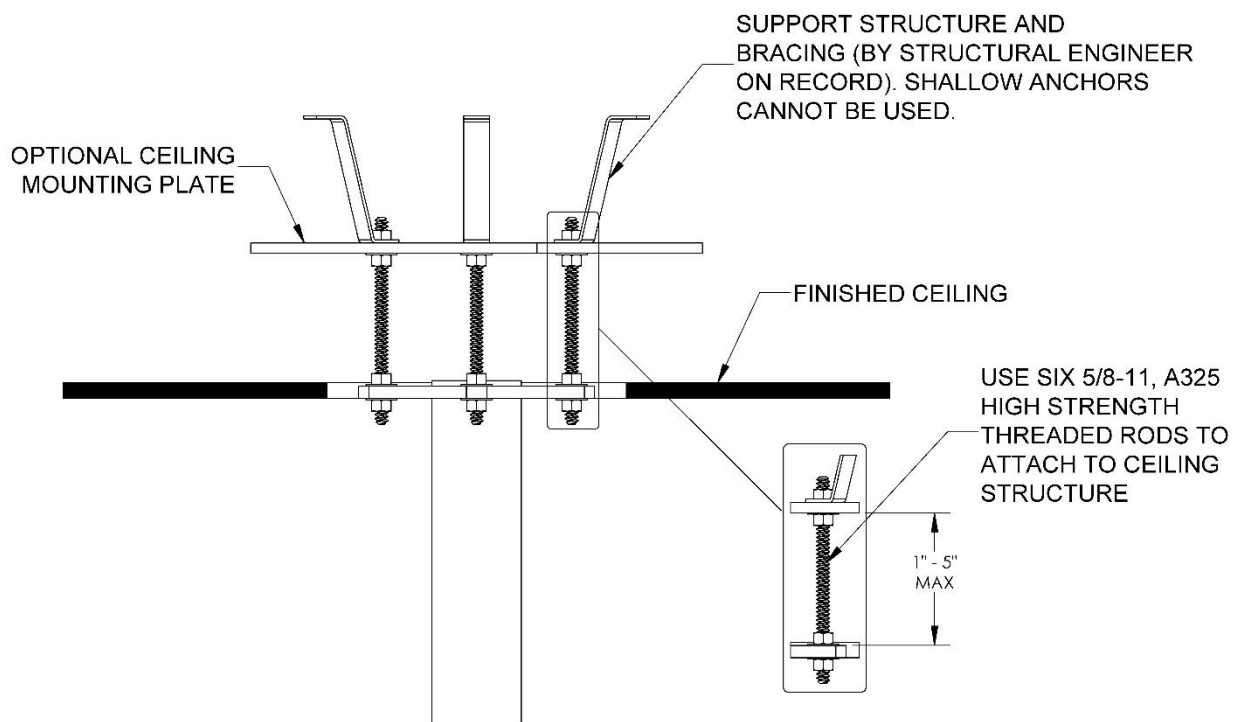
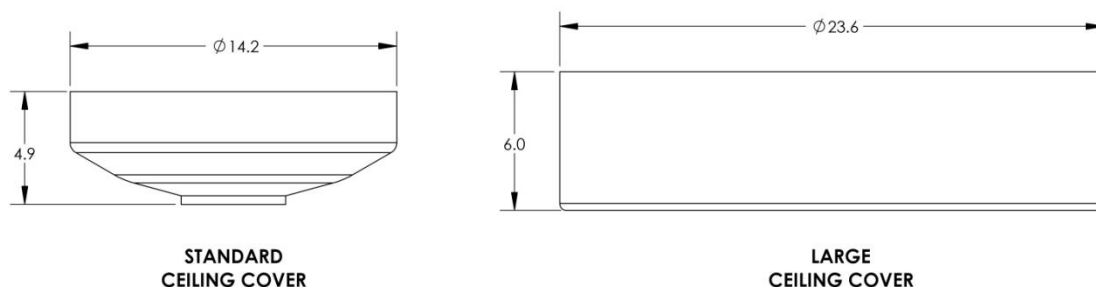


Figure 2: Recommended Ceiling Structure Construction

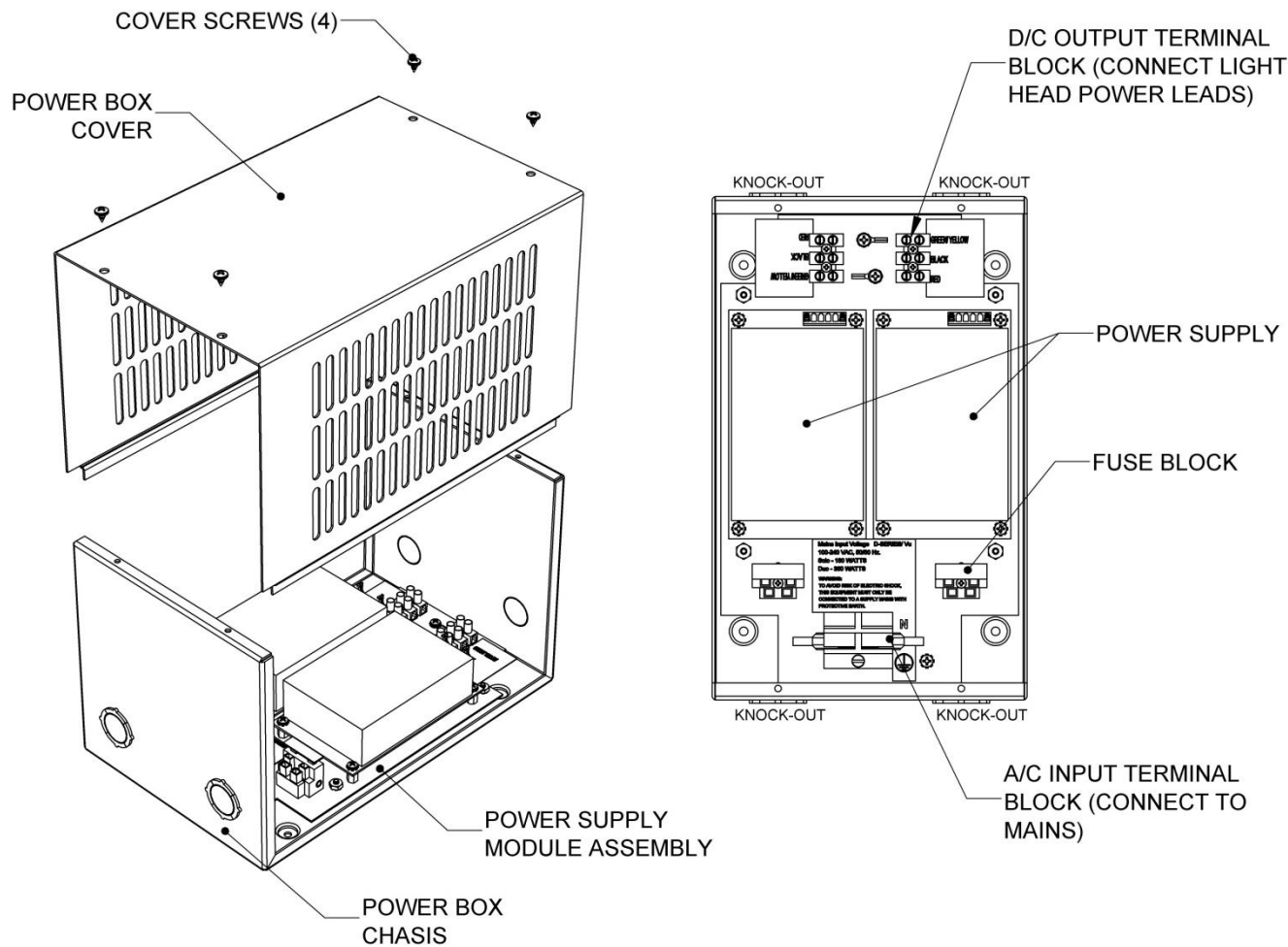
Ceiling Cover

The Standard Ceiling Cover is included with the system and can be used in most installations. If the finished ceiling level is above the mounting plate, or there is a larger ceiling opening, a larger Ceiling Cover is available.



Power Box

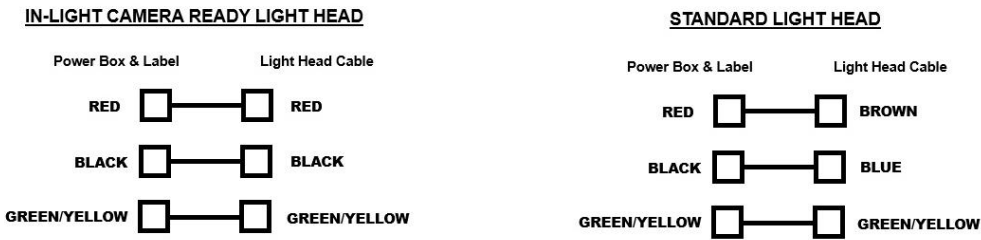
The System Two LED Power Box supplies the power necessary to illuminate the System Two LED surgical light systems. Remove the four screws on the top cover and lift cover off to make connections or change a fuse.



NOTE: INTERNAL WIRING NOT SHOWN FOR CLARITY

DUAL POWER SUPPLY SHOWN

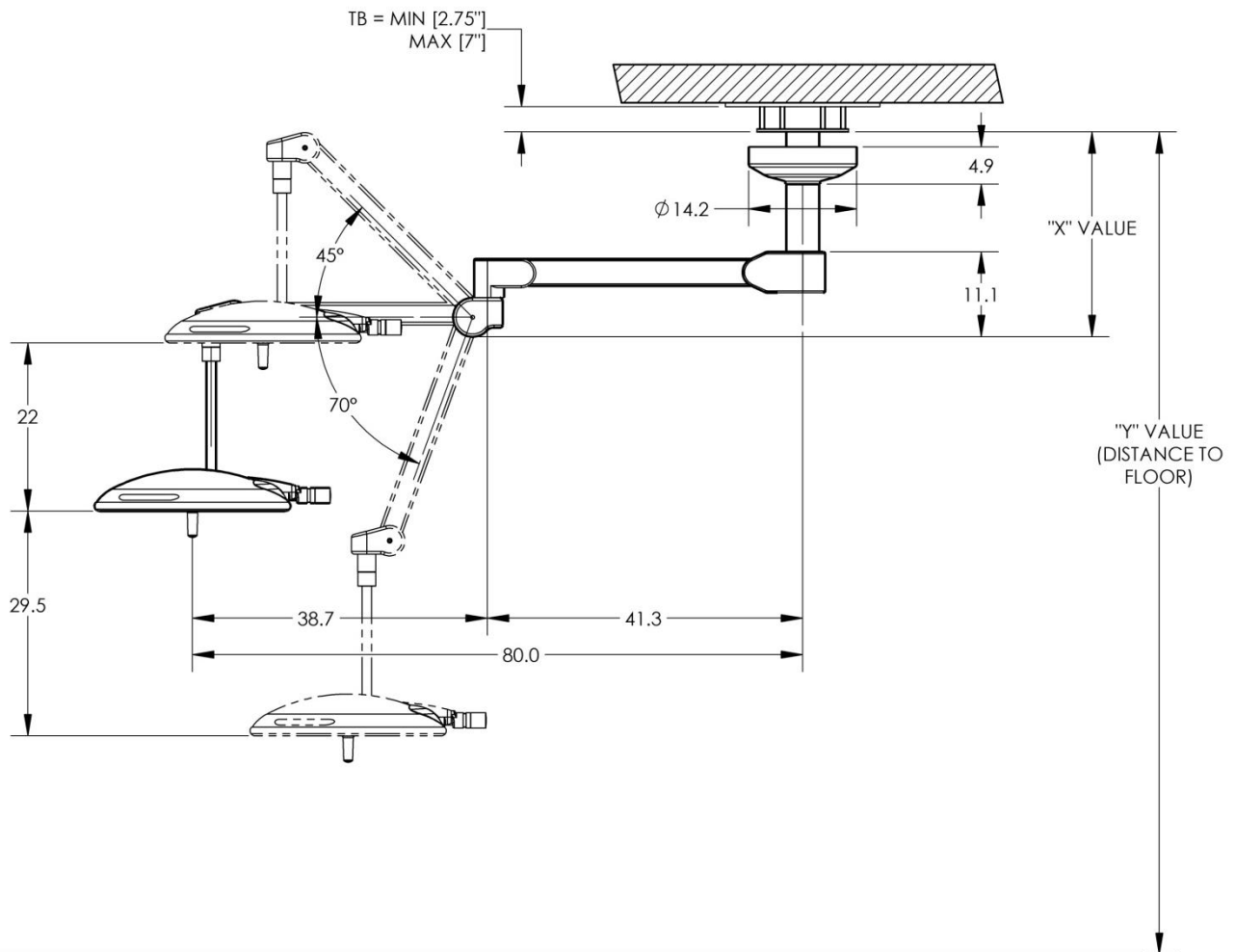
Figure 3: The Power Box and Connection Diagram



Ceiling Rod Calculation, Single Mount

Use the following table to select the correct length ceiling rod for your application

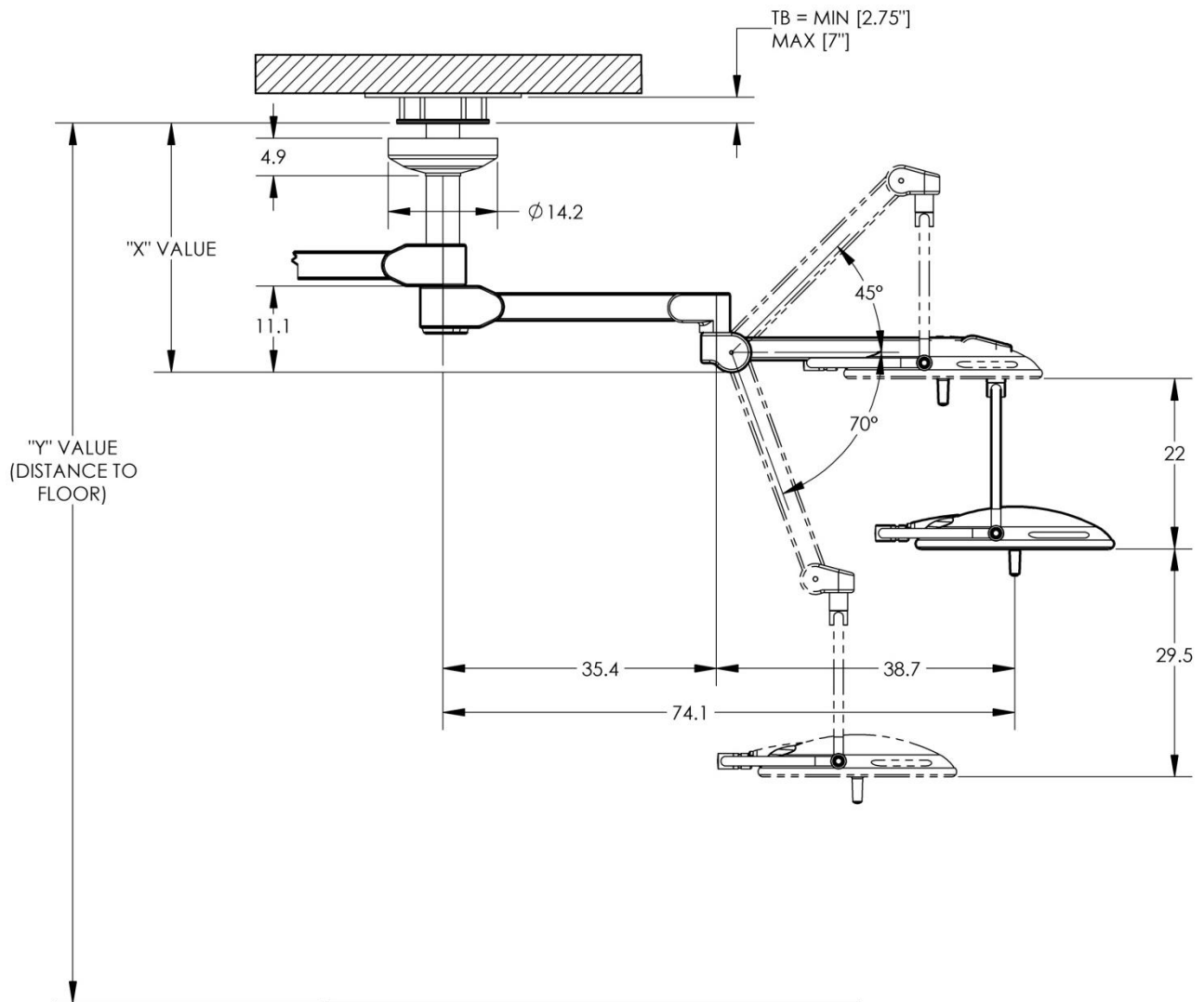
Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'0"/108"	8"	19"	89"
9'6"/114"	16"	27"	87"
10'0"/120"	24"	35"	85"
10'6"/126"	32"	43"	83"
11'0"/132"	39"	50"	82"
12'0"/144"	47"	58"	86"



Ceiling Rod Calculation, Dual Mount

Use the following table to select the correct length ceiling rod for your application

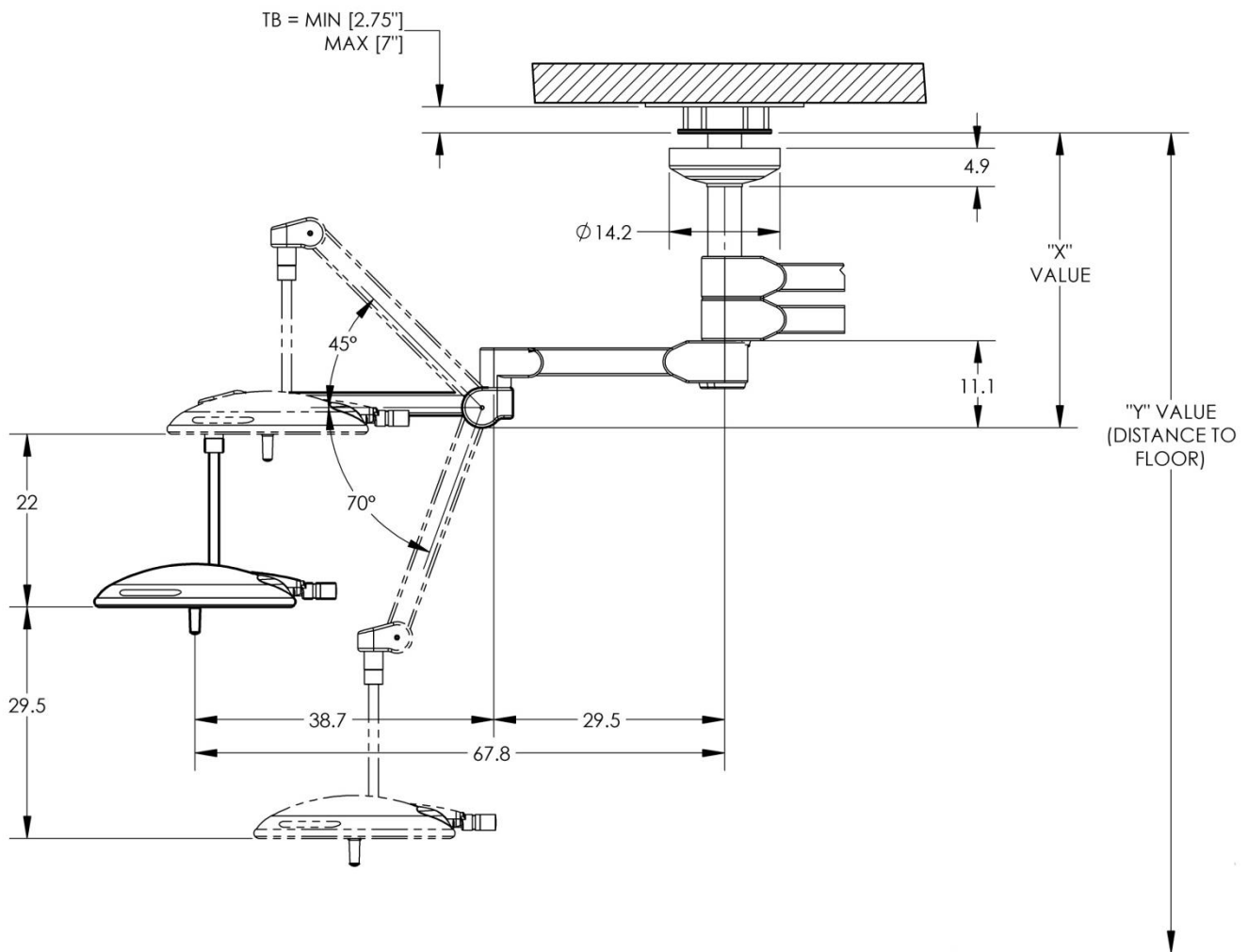
Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'0"/108"	8"	26"	82"
9'6"/114"	16"	34"	80"
10'0"/120"	16"	34"	86"
10'6"/126"	24"	42"	84"
11'0"/132"	32"	50"	82"
12'0"/144"	39"	57"	87"
12'0"/144"	47"	65"	79"



Ceiling Rod Calculation, Triple Mount

Use the following table to select the correct length ceiling rod for your application

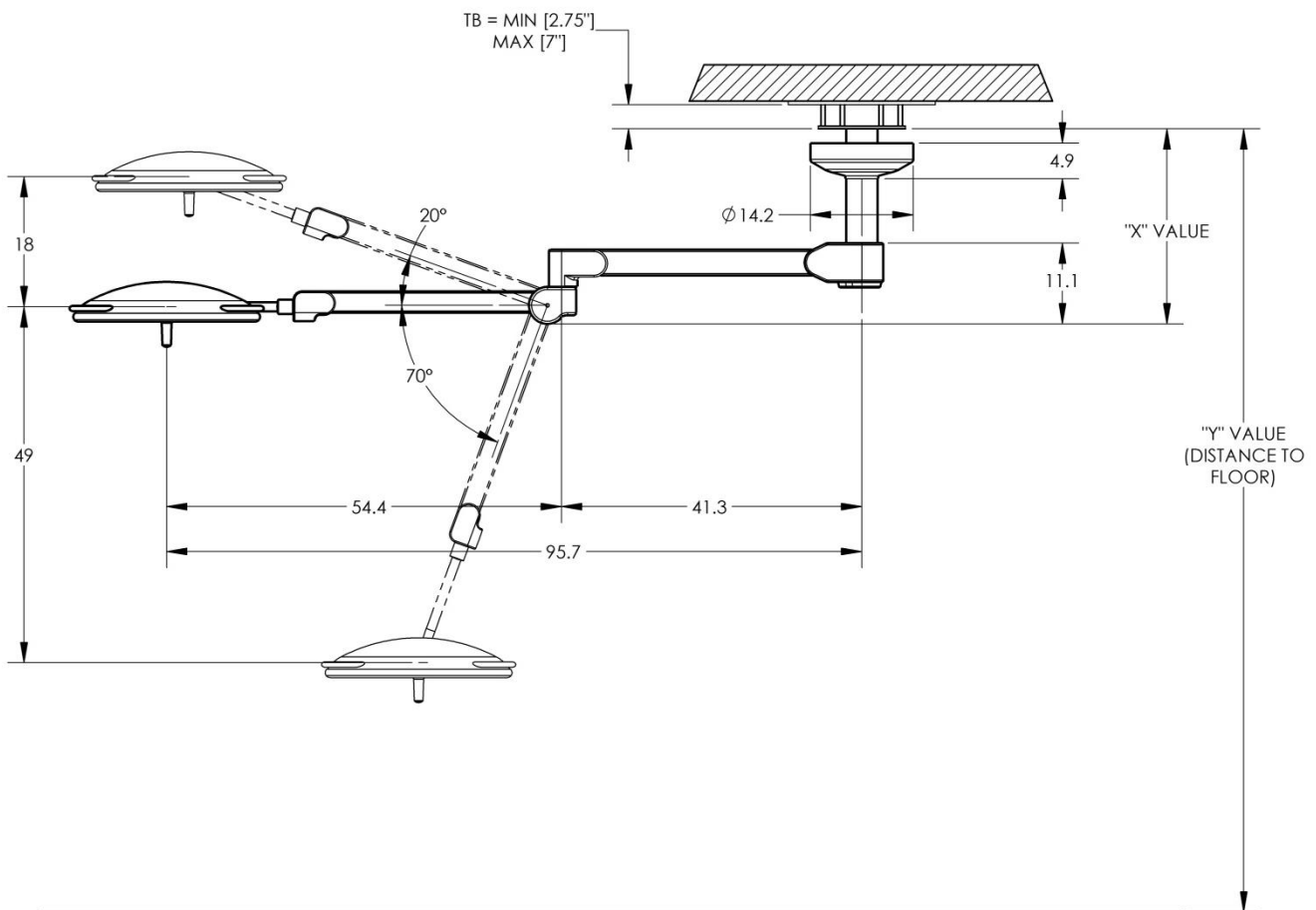
Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'0"/108"	8"	32"	76"
9'6"/114"	8"	32"	82"
10'0"/120"	16"	40"	80"
10'6"/126"	24"	48"	78"
11'0"/132"	24"	48"	84"
12'0"/144"	32"	56"	88"



Ceiling Rod Calculation, Single LCH Mount

Use the following table to select the correct length ceiling rod for your application

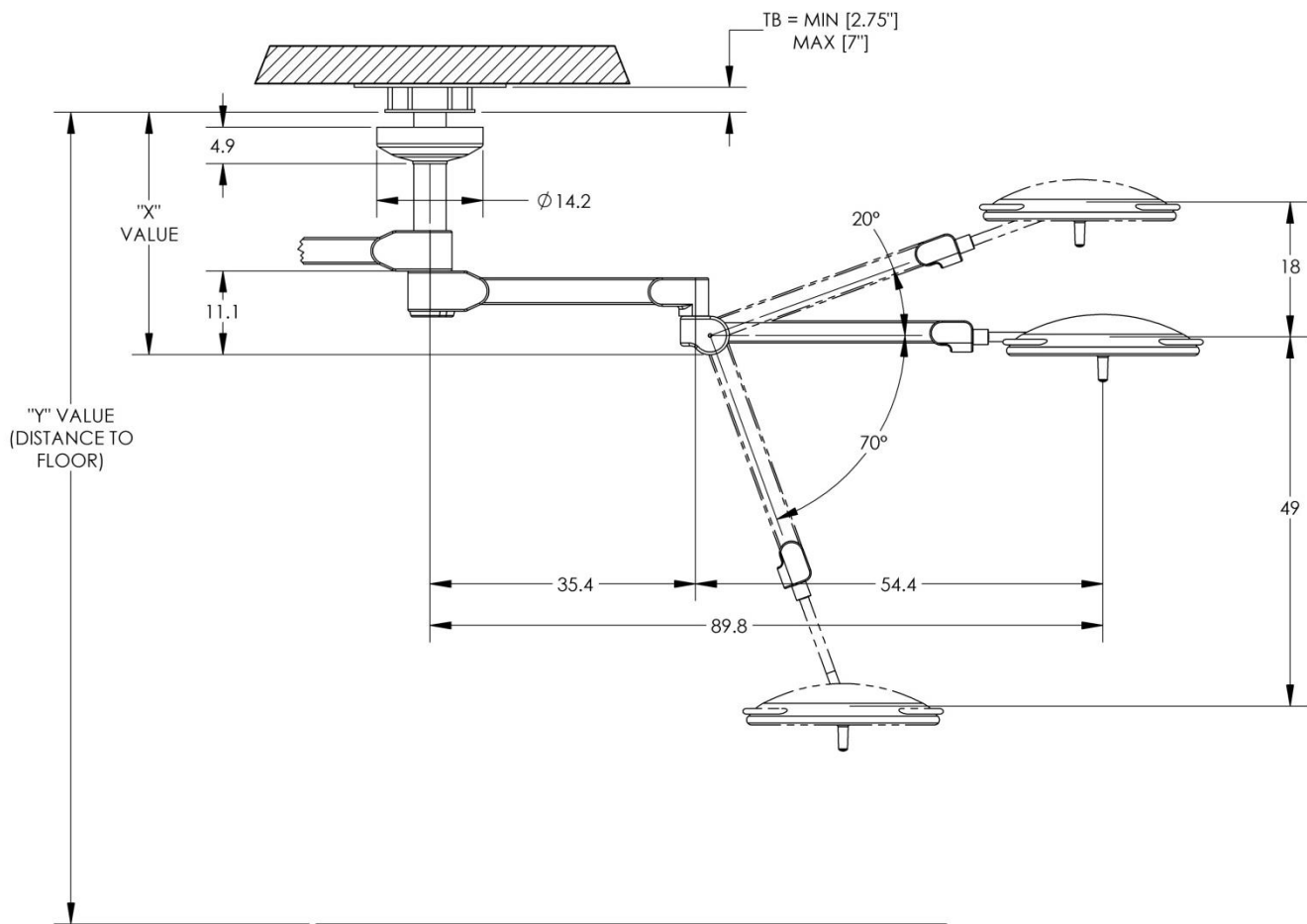
Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'0"/108"	8"	19"	89"
9'6"/114"	16"	27"	87"
10'0"/120"	24"	35"	85"
10'6"/126"	32"	43"	83"



Ceiling Rod Calculation, Dual LCH Mount

Use the following table to select the correct length ceiling rod for your application

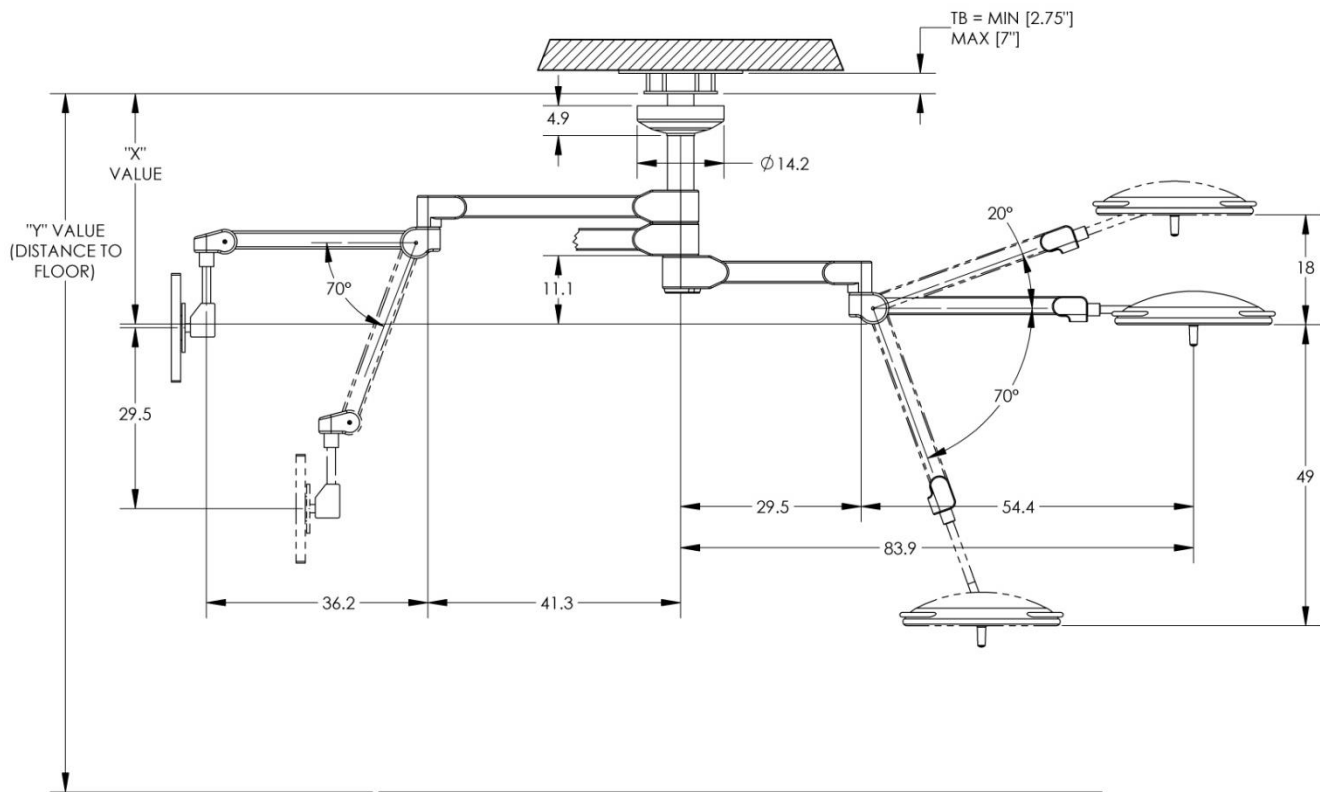
Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'0"/108"	8"	26"	82"
9'6"/114"	16"	34"	80"
10'0"/120"	24"	42"	78"
10'6"/126"	32"	50"	76"



Ceiling Rod Calculation, Triple LCH Mount

Use the following table to select the correct length ceiling rod for your application

Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head Room to Bottom of Extension Arm "Y"-Value – X-Value
9'6"/114"	16"	40"	74"
10'0"/120"	16"	40"	80"
10'6"/126"	24"	48"	78"



Section 4: Installing the Light System

Installing the Central Axis

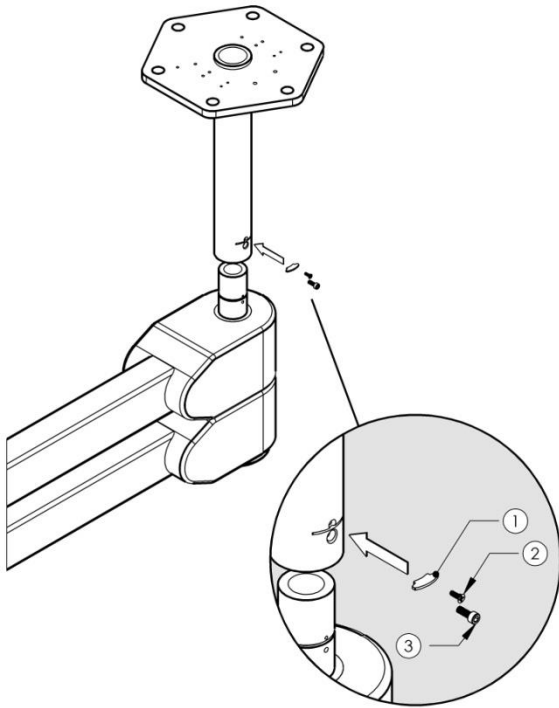


Figure 4: Installing the Central Axis on a 65mm Down Tube

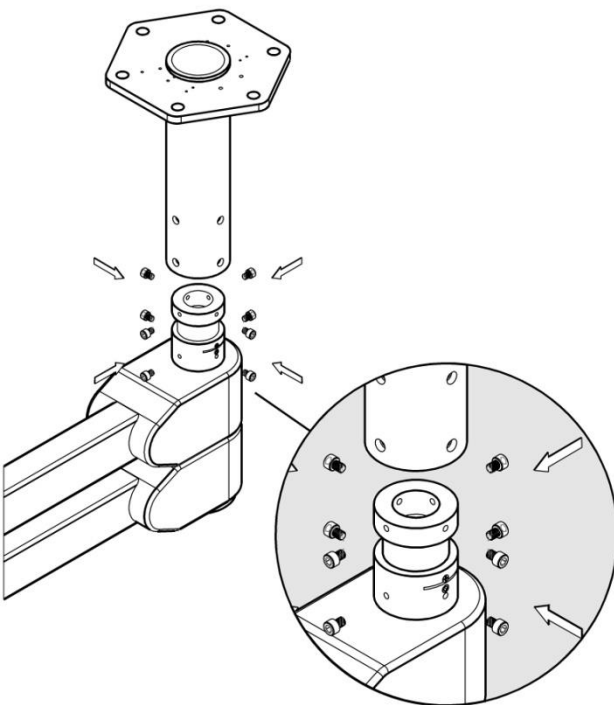


Figure 5: Installing the Central Axis on a 110mm Down Tube

Installing the Central Axis requires two people and using an equipment lift is HIGHLY recommended. See Section 3 for the Mounting Plate and Ceiling Structure guidelines.

Once the support structure and Hex Plate/Down Tube are securely installed and level, the Central Axis is ready to be installed. Locate the Securing Segment, Flat Head Screw and Allen Cap Screw and have ready.

NOTE: The DC Power Cables and Ground Cable (not shown) coming out of the Central Axis must be guided up through the Down Tube while lifting the hub of the Central Axis up into the Down Tube.

Using an equipment lift position the Central Axis under the bottom of the Down Tube. Carefully position the Central Axis so that the hub aligns with the Down Tube.

Lift the Central Axis until the hub goes up into the Down Tube until it lines up with the Securing Segment slot. Insert a greased Securing Segment until it stops and ensure that it is seated. The outer edge of the Securing Segment must be inside the outer diameter of the Down Tube.

With the Securing Segment installed, insert the Flat Head Screw into the top hole and then install the Allen Cap into the lower hole. Slowly remove height from the equipment lift and check the rotations. If the Central Axis rotates smoothly and without binding, tighten the Allen Cap and then tighten the Flat Head Screw. Recheck the ease of rotation.

The tightness of the Flat Head Screw and the Allen Cap should be incorporated into the equipment Preventative Maintenance Program

Mounting with the 110mm Down Tube

Using an equipment lift position the Central Axis under the bottom of the Down Tube. Carefully position the Central Axis so that the hub aligns with the Down Tube.

Lift the Central Axis until the hub goes up into the Down Tube. Continue lifting until the screw holes in the Down Tube aligns with the thread holes. Insert the 8 socket cap screws ensuring that the screws are seated and sufficiently tight.

Rotate the Extension Arm(s) to ensure free and smooth rotation.

The tightness of the Flat Head Screw and the Allen Cap should be incorporated into the equipment Preventative Maintenance Program

Mounting the Extension Arm set to the Ceiling Tube

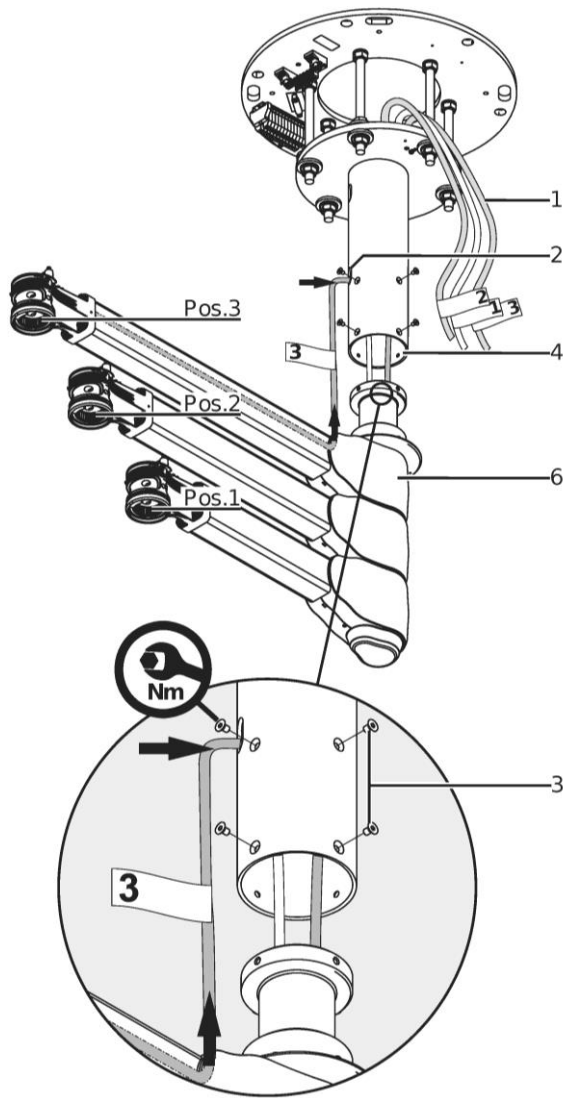


Figure 6: Mounting the Extension Arm set to the Ceiling Tube

The figure shows an illustration of a Central Axis with 3 Extension Arms (6). The installation procedure for other versions is identical.

1. Route the supply cable (1) through the flange with the Ceiling Tube (4) towards the mounting plate.
2. Insert the supply cable for the upper Extension Arm into the mounting aperture (2) in the flange with the Ceiling Tube (4) and route it towards the mounting plate.
 - Provide a cable length of approx. 80cm for the cable loop to be laid afterwards in the rotating canopy.
3. Remove the packaging from the Extension Arm set [6] pivot.
 - Make sure you do not remove the lubricant from the Extension Arm set (6) pivot.
4. Before inserting the Extension Arm set [6] into the ceiling tube, rotate it in position such that the holes for the 8 countersunk screws (3) in the ceiling tube and Extension Arm align.
5. Insert the Extension Arm set (6) into the flange with ceiling tube (4) without using a great deal of force and without twisting.
 - To do this, make sure you route the supply cables (1).

*** Warning ***

The Extension Arm can drop if the fixing element has not been properly tightened.

6. Screw in 8 countersink screws and tighten to 10Nm.
7. Check the horizontal alignment of the Extension Arm set (6).
 - Place the digital level onto the uppermost Extension Arm set (6).
 - Rotate the Extension Arm (6) 90° in various directions and check the horizontal alignment.
 - The deviation from the horizontal must not exceed $\pm 0.2^\circ$.
 - In case of deviations by more than 0.2° the Extension Arm (6) must be realigned as described in step 7 above.

Mounting the Rotating Canopy

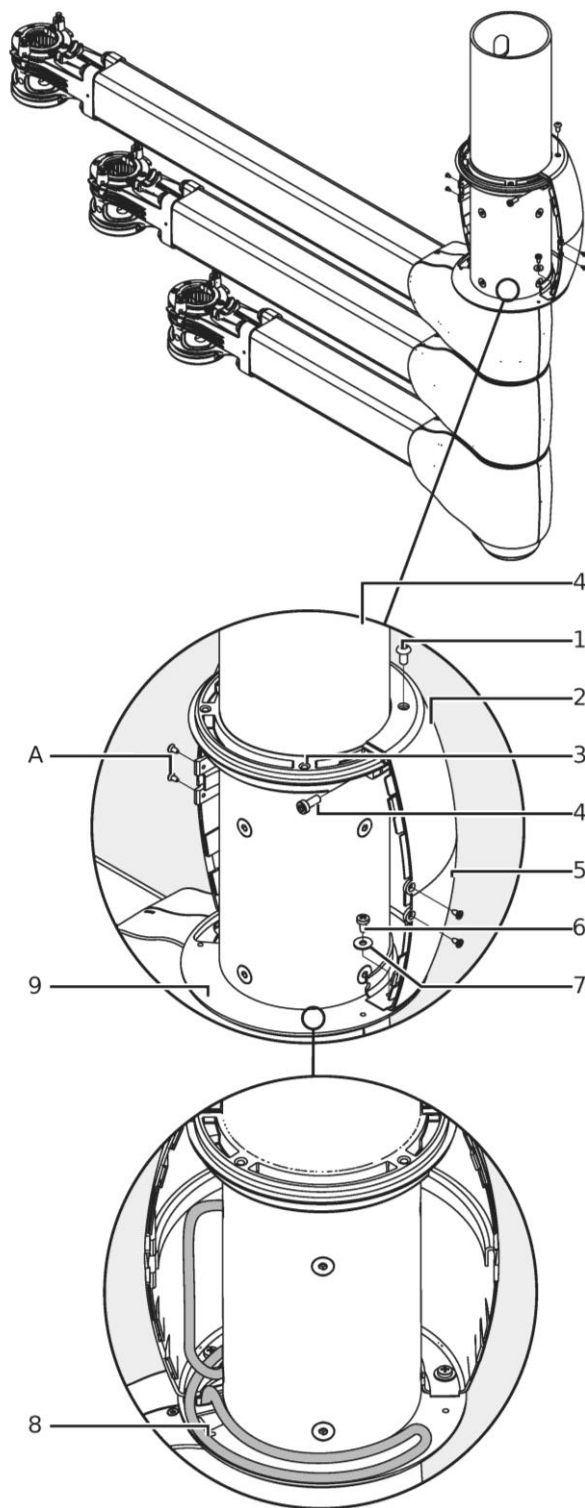


Figure 7: Mounting the Rotating Canopy

The figure shows a simplified representation of the ceiling tube without flange.

1. Lay 2 half rings for the rotating canopy (3) around the flange with ceiling tube [4] (with the threaded holes pointing inwards); screw in the 2 cylinder screws (4) and tighten them such that the 2 rotating canopy half rings (3) can still move manually.
2. Place 1 disc Ø4.3 (7) on each fillister head screw (6).
3. Place the first bottom rotating canopy half (5) onto the rotating canopy disc (8) and screw it on using 2 fillister head screws (6) and the disc Ø4.3 (7).
4. Push the rotating canopy half rings (3) towards their correct position and then insert the first, top rotating canopy half (2) into the bottom rotating canopy half (5).
 - Make sure you leave a gap of approximately 0.04" (1mm) between the top and the bottom rotating canopy half (5).
5. Screw the first, top rotating canopy half (2) into the rotating canopy half rings (3) using 2 fillister head screws (1).
6. Lay the supply cable (8) in the rotating canopy halves in a loop as illustrated in the Figure such that the supply cable (8) is not exposed to tensile stress when rotating the upper Extension Arm.
 - Make sure that the supply cable (8) is not exposed to tensile stress in the 2 end stop positions.
7. Please the second, bottom rotating canopy half (not illustrated) onto the rotating canopy disc (9) and screw it on using 2 fillister head screws.
8. Screw the second, top canopy half (not illustrated) onto the rotating canopy disc (9) and screw it on using 2 fillister head screws (1).
9. Connect the 4 rotating canopy halves with each other using 4 PT screws (10).
10. Check that the canopy halves are securely in place.
 - The rotating canopy halves must engage tightly with each other without gaps.
 - The locking mechanisms on the rotating canopy halves must be undamaged and lock against each other.
 - Make sure that all the screws are tightened.

Mounting the L17 and LCH Spring Arm

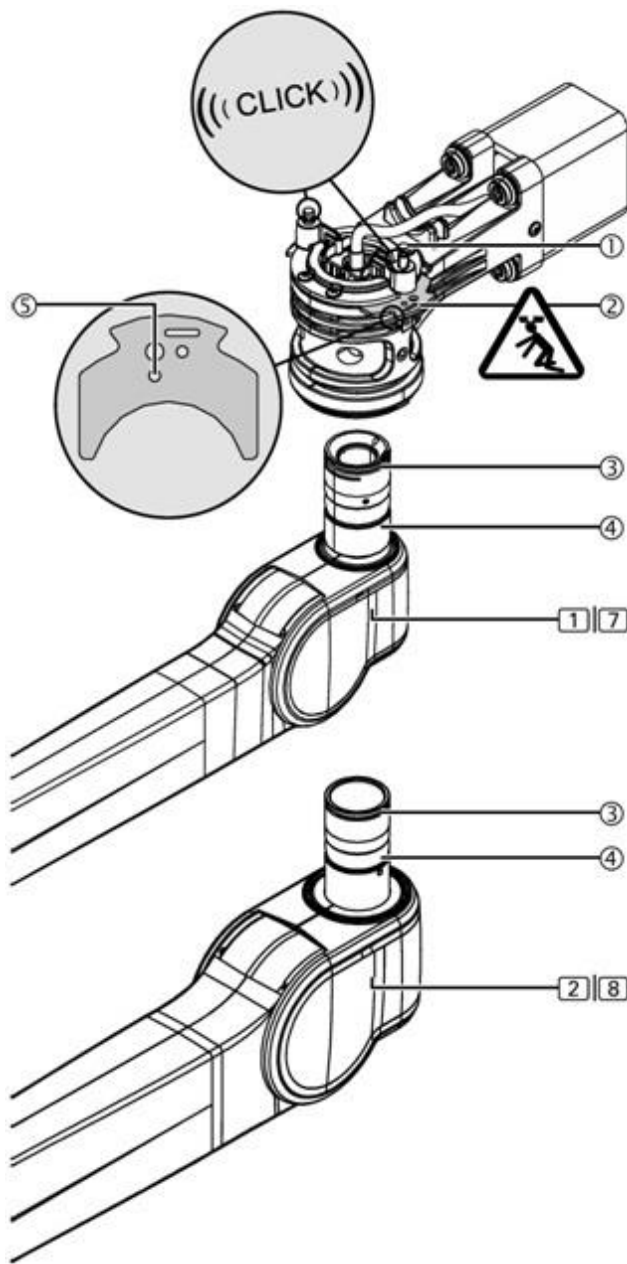


Figure 8: Mounting the L17 and LCH Spring Arms

Two people are required to mount the Spring Arm. An equipment lift is highly recommended to avoid injury in lifting the Spring Arm into place.

1. Pull the 2 latch pins ① upwards and route the 2 securing segments ② out of the Extension Arm until they snap into place ⑤.
2. Insert the Spring Arm pivot ④ straight into the Extension Arm up to the end stop without twisting.
 - The plug couplings mounted inside the Extension Arm and Spring Arm are connected during this installation step.
3. Insert 2 securing segments ② into the Extension Arm up to the end stop such that they snap into place:
 - The 2 securing segments ② must protrude into the groove ③ on the Spring Arm pivot ④
 - The 2 spring-actuated latch pins ① audibly click into place.

***** Risk of the Light Head dropping *****

If the 2 securing segments ② are not properly mounted, there is a risk of the Spring Arm with the Light Head dropping and causing serious injury. Check the 2 securing segments ② are securely in place:

- The Spring Arm must be inserted into the Extension Arm up to the end stop.
- The 2 securing segments ② must be inserted into the Extension up to the end stop such that they protrude into the groove ③ on the Spring Arm pivot ④.
- The 2 latch pins ① must audibly snap into place and be on the same height after the installation.

Mounting the MD21/MD21+ Spring Arm

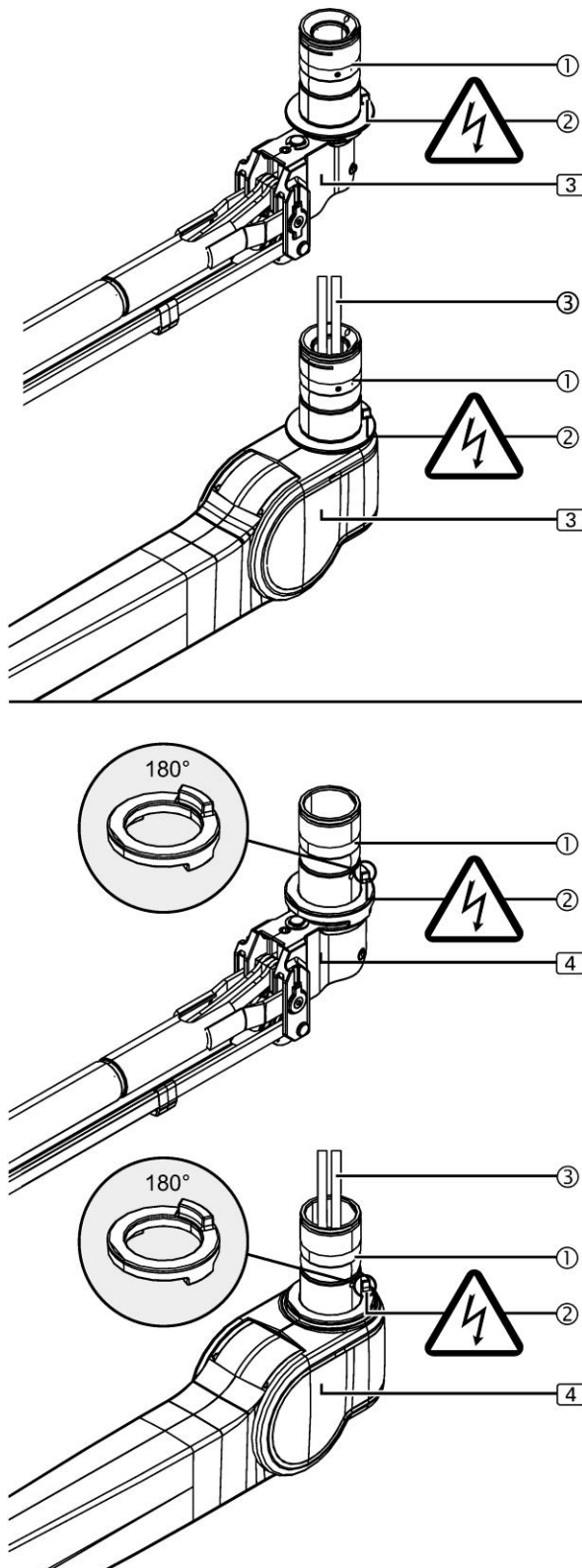


Figure 9: Mounting the MD21/MD21+

The Figure shows the MD21 Spring Arm [3] and the MD21+ Spring Arm [4] without and with covers. The Spring Arms have different geometry. The installation procedure is identical. The end stop [2] must be mounted for all Spring Arm versions with cables.

Electrical shock hazard

The Spring Arm with cables [3] must be fitted with an end stop [2] (twist protection) which restricts the swivel range of the Spring Arm. If the end stop [2] is not mounted, the cables are twisted off and the Arm System is energized. Contact with energized components present danger to life from electrical shock;

- Check that the end stop [2] is mounted to the Spring Arm.
- For the MD21+ [4] the end stop [2] from the accessories must be mounted.
- The Spring Arm must not be mounted without an end stop [2]

Only for the MD21 with cables [3] or optionally for versions without cables [3]

1. Check that the end stop [3] is pre-assembled on the Spring Arm pivot [1].
- The Spring Arm with cables [3] must not be mounted without the end stop [2].
- If the end stop [2] is not included in the accessories, contact Customer Service.

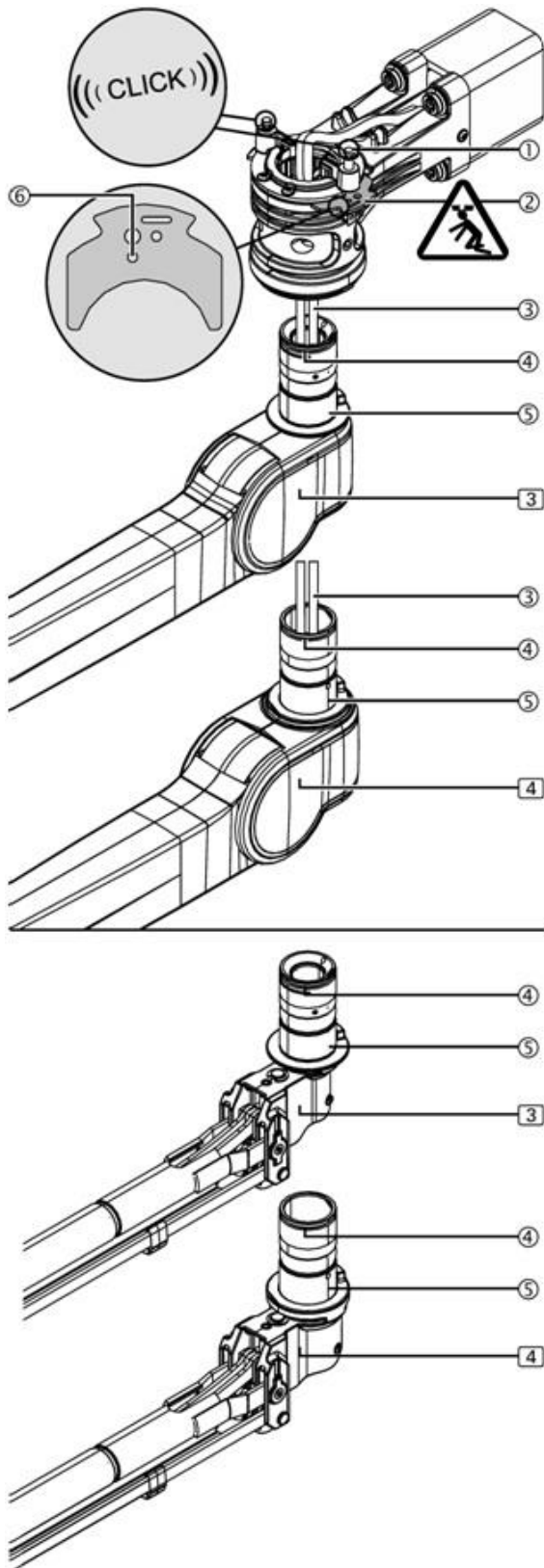
Only for the MD21+

1. Place the end stop [2] onto the Spring Arm.
- The end stop [2] can be rotated by 180°.
- When rotating the end stop [2], the end stop area of the Spring Arm is rotated by 180°.
- If the end stop [2] is not included in the accessories, contact Customer Service.

***** Risk of the Monitor Arm dropping *****

If the 2 securing segments [2] are not properly mounted, there is a risk of the Spring Arm with the Monitor Arm/Cradle dropping and causing serious injury. Check the 2 securing segments [2] are securely in place.

Mounting the MD21 Spring Arm (cont)



The figure shows the MD21 Spring Arm with and without the cover panels.

1. Route the pre-assembled cables (3) through the Extension Arm.
2. Pull the 2 latch pins (1) upwards and route the 2 securing segments (2) out of the Extension Arm until they snap in place (6).
3. Insert the Spring Arm pivot (5) straight into the Extension Arm up to the end stop without twisting.
4. Insert 2 securing segments (2) into the Extension Arm up to the end stop such that it snaps in place:
 - The 2 securing segments (2) must protrude into the groove (4) on the Spring Arm pivot (5)
 - The 2 spring-actuated latch pins (1) audibly click into place.

***** Risk of the Monitor Cradle dropping *****

If the 2 securing segments (2) are not properly mounted, there is a risk of the Spring Arm with the Light Head dropping and causing serious injury. Check the 2 securing segments (2) are securely in place:

- The Spring Arm must be inserted into the Extension Arm up to the end stop.
- The 2 latch pins (1) must audibly snap into place and be on the same height after the installation

Preparing the MD21 Spring Arm

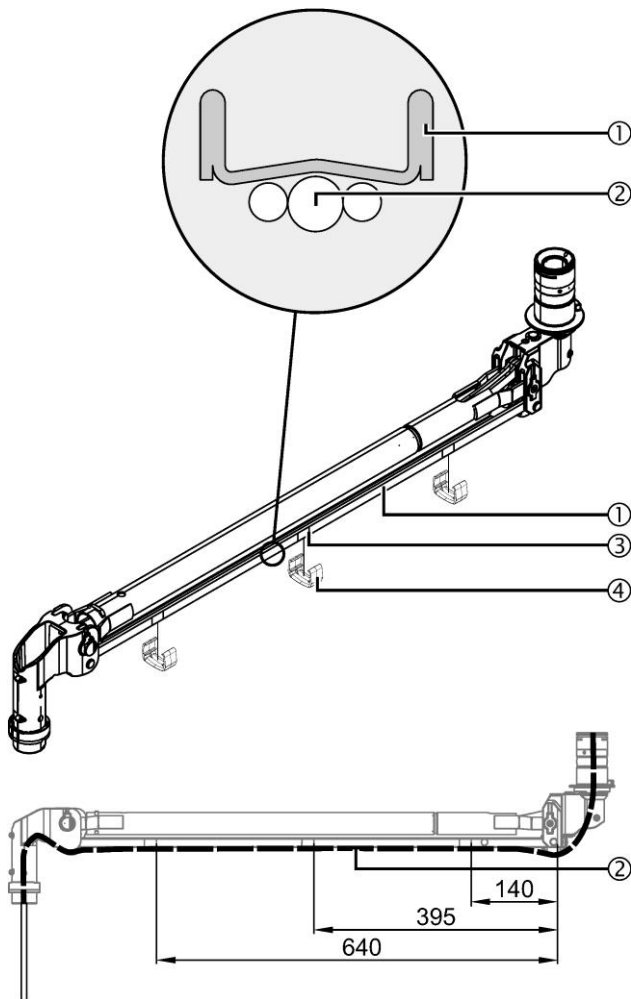


Figure 10: Mounting external cables

The Figure shows simplified illustrations which explain how to lay external cables ② in the MD21 Spring Arm [3] (the joint securing device on the front joint is not shown). The steps for installing the Spring Arm are identical for the MD21 and the MD21+.

Marking the cable clips

1. Permanently mark the position ③ of the cable clips ④ on the parallel guide ①;
- The parallel guide of the Spring Arm starts at the reference edge for the dimensioned distances to the cable clips ④.
- If the 3 cable clips ④ are not mounted back to their previous positions, the side panels are pushed on and no longer flush with each other.
2. Disengage the 3 cable clips ④ laterally from the parallel guide using a suitable screwdriver and remove them.

Mounting Cables

1. Adjust the vertical lift of the Spring Arm to the lowermost horizontal (0°).

*** **Warning** ***

Electrical Shock Hazard

If the external cables ② are not laid next to each other and without twisting or if the external cables ② are damaged, the Arm System is energized. Contact with energized components presents a danger to life from electrical shock.

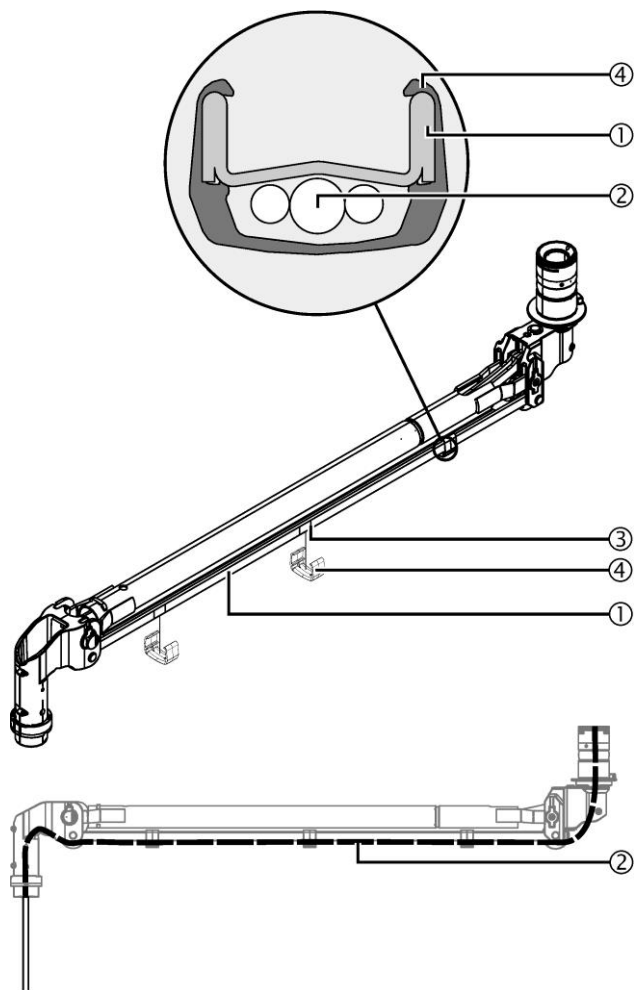
- Make sure that you lay the external cables ② next to each other and without twisting
- Do not damage the cable insulations.

*** **Warning** ***

Damaged external cables ② can energize the Arm System.

- Check all external cables ② for damage. Make sure you insert them with great care without cables/tubes crossing each other without loops and without twisting.
- Do not damage the cable insulation
- 2. Route the external cables ② towards the parallel guide ① at the bottom of the Spring Arm and then route them through the Spring Arm next to each other and without twisting as illustrated in the Figure.
- To do this, make sure that you centrally lay the external cable with the largest cross section as illustrated in the Figure.

Preparing the MD21 Spring Arm (cont)



Fixing the cables

1. Click 3 cable clips (4) onto the previously marked positions (3) on the parallel guide (1) ;
- If the 3 cable clips (4) are not mounted back to their previous positions, the side panels are pushed on and no longer flush with each other.

*** Warning ***

Damaged external cables (2) can energize the Arm System.

- Lay the external cables (2) in the Spring Arm in such a way that they are not exposed to tensile stress in any position.
 - Do not damage the cable insulations.
 - When inserting or laying external cables (2) the permissible minimum deflection and bending radii and the permissible maximum tensile stress values must be observed. The specifications of the corresponding cable manufacturer must be adhered to.
2. Check the clearance of the external cables (2);
 - The external cables (2) must be laid to the front and rear joint of the Spring Arm with a slight, strain free curvature.
 3. If required, extend the vertical lift of the Spring Arm in Section 6.
 - Check that the external cables (2) are not exposed to tensile stress and that the Spring Arm can be freely moved.

Preparing the L17 Spring Arm

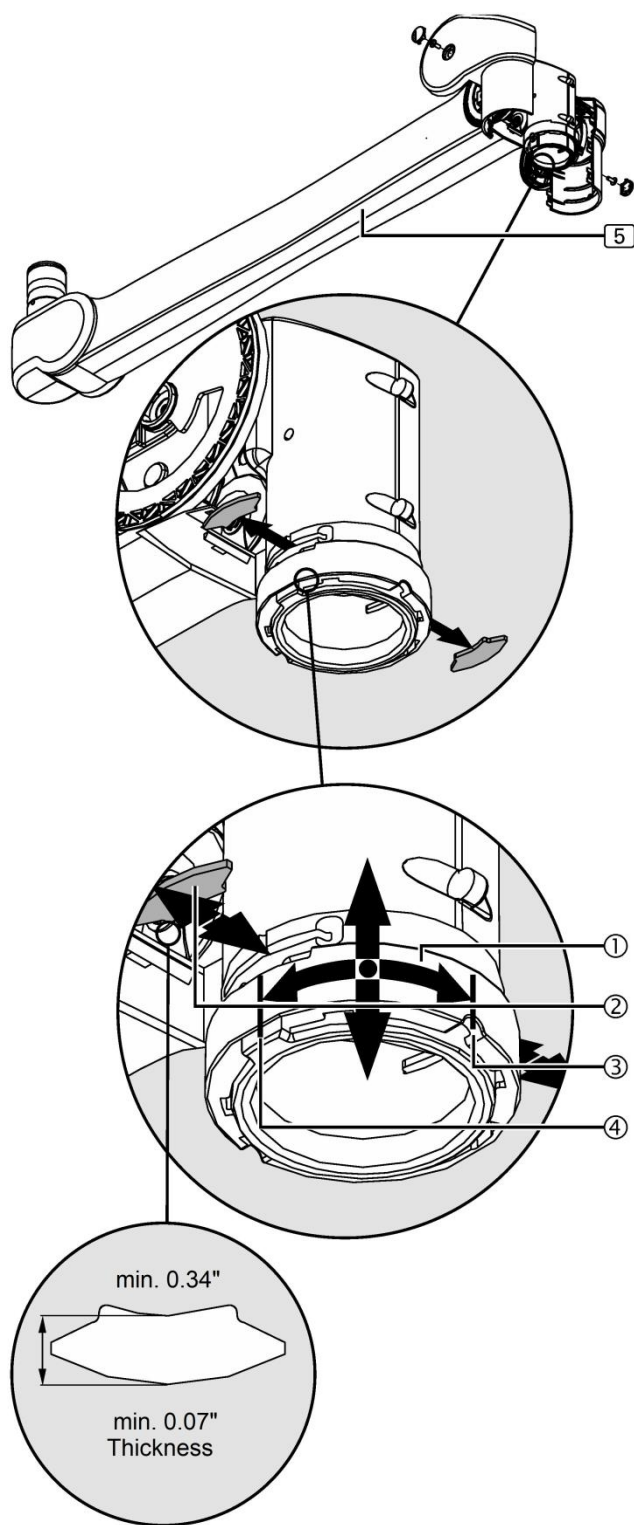


Figure 11: Preparing the L17 Spring Arm

The Figure shows a simplified illustration of the Spring Arm [5] without cables or Light Head.

***** Risk of the Light Head dropping *****

The Light Head is kept in its position in the Spring Arm by 2 securing segments. If both securing segments are dismantled simultaneously from the Spring Arm, there is a risk of the Light Head dropping out of the Spring Arm and causing severe injury;

- **Dismantle the securing segments one at a time.**

Dismantling the first securing segment

1. Rotate the segment securing device ① approximately 90° to the right, route it slightly downwards and then remove the first securing segment ②.
- To do this, cover the second securing segment on the opposite side with your hand in order to prevent it from dropping out of the Spring Arm.
2. Remove the second securing segment in the same manner.
3. Route the segment securing device ① back upwards.

Mounting the Light Head to L17 Spring Arm

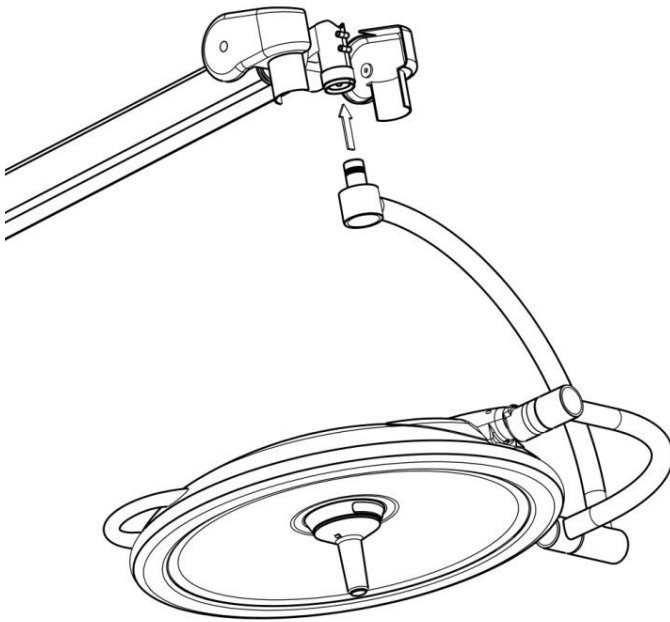


Figure 12: Mounting the Light Head

Note: For In-Light Camera Light Heads and Monitor Cradles, run the wires from the yoke pivot into the arm before installing the Light Head.

Installing the Light Head or the Monitor Cradle to the L17 Spring Arm requires two people to position the Light Head yoke or Monitor Cradle pivot into the receptacle.

Use the detail illustrations on the previous page

- Remove the Plastic Covers from the Spring Arm
- Position the yoke pivot directly under the receptacle
- Lubricate the pivot on the Yoke (going into the Spring Arm) with white grease through the fitting aperture of the securing segment ②.
- Carefully slide the pivot into the receptacle.

***** Risk of the Light Head dropping *****

- Once the Light Head yoke pivot is in the L17 Spring Arm you are ready to install the two securing segment ②.

Mounting the first securing segment

1. Lubricate the securing segment ② with a White solid lubricant paste grease (white grease)
2. Route the segment securing device ① slightly downwards.
 - To do this, cover the second securing segment on the opposite side with your hand in order to prevent it from dropping out of the Spring Arm.
3. Place the securing segment ② and route the segment securing device ① towards the top and then rotate it approximately 90° to the left.
 - The cutout ③ in the segment securing device ① must protrude over the optional brake screw or brake screw hole ④.
4. Check that the securing segment ② is securely in place;
 - The Light Head/Yoke Assembly or the Monitor Cradle must rotate freely.

Checking the second securing segment

5. Dismantle and check the second securing segment as described in Section 6.
6. Re-mount the second securing segment.

Adjusting the vertical lift and the optional brake

- Adjust the vertical lift of the Spring Arm as described in Section 5.
- Mount the cover panels to the Spring Arm.

Preparing the LCH Spring Arm

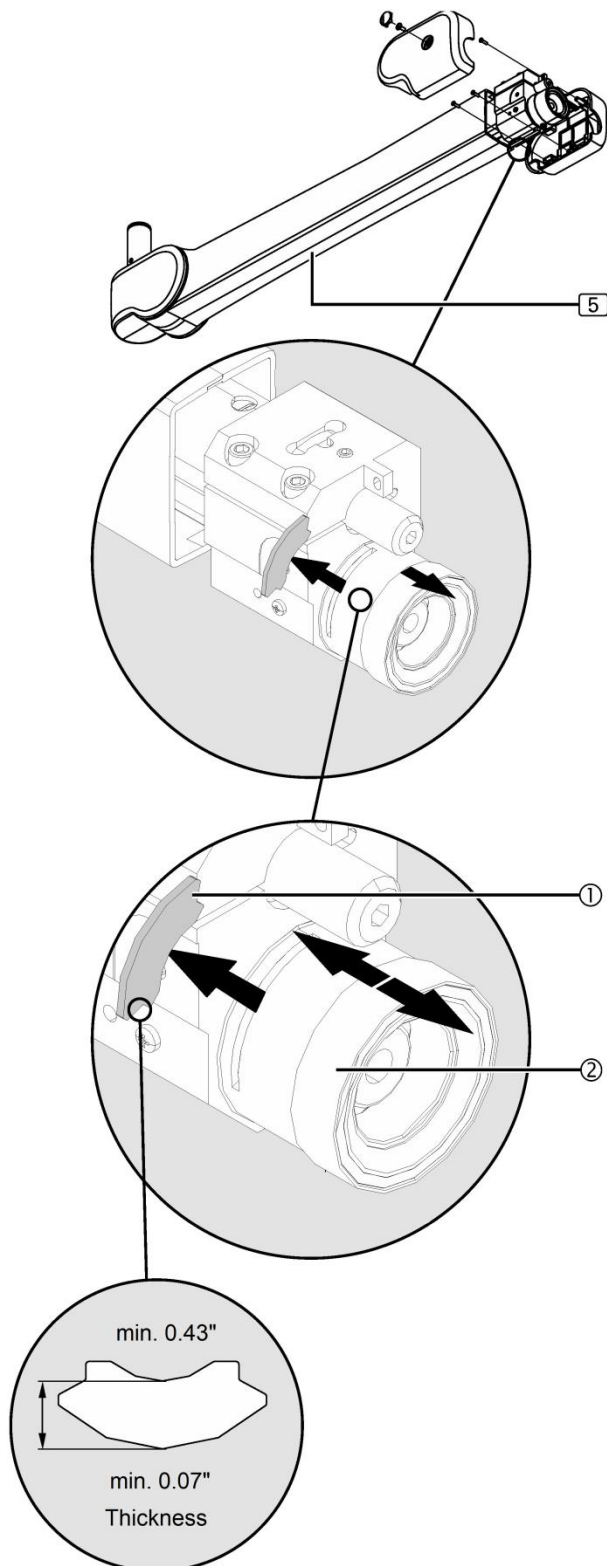


Figure 13: Preparing the LCH Spring Arm

The Figure shows a simplified illustration of the Spring Arm [5] without cables or Light Head.

Remove the Plastic Covers as shown

***** Risk of the Light Head dropping *****

The Light Head is kept in its position in the Spring Arm by ① securing segment. If the securing segment is dismantled, there is a risk of the Light Head sliding out of the Spring Arm, dropping and causing severe injury;

- To dismantle the securing segment, route the adaption with the Light Head/Yoke Assembly or Monitor Cradle out of the Spring Arm.

Moving the segment securing device

1. Unscrew the Phillips recessed head screw ③.
2. Push the segment securing device ② forwards until the securing segment ① is accessible.
3. Slightly unscrew the optional brake screw

Dismantling the securing segment

4. Remove the securing segment ① and position the Light Head/Yoke Assembly or Monitor Cradle out of the Spring Arm. [5]. Check whether the securing segment ① achieves a minimum thickness of 0.07" (1.8mm) and a minimum length of 0.43" (10.9mm); otherwise, replace the securing segment.

Mounting the Light Head to LCH Spring Arm

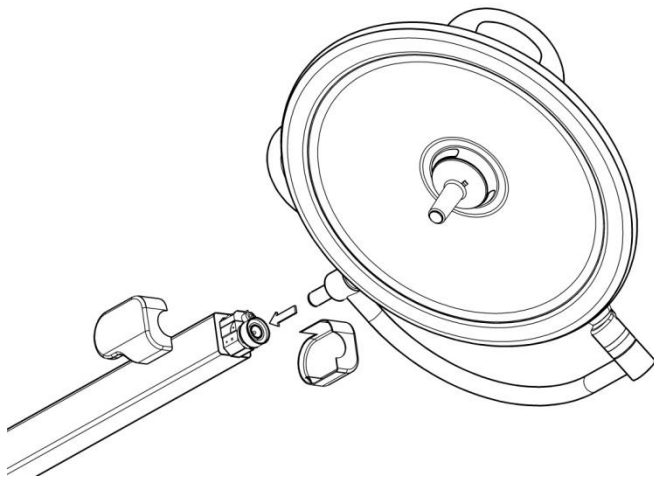


Figure 14: Mounting the Light Head to an LCH Arm

Installing the Light Head into the LCH Spring Arm requires two people to position the Light Head yoke pivot into the receptacle.

Use the detail illustrations on the previous page

*** Risk of the Light Head dropping ***

- Align the yoke pivot to the receptacle on the LCH Spring Arm.
- Lubricate the pivot on the Yoke (going into the Spring Arm) with white grease through the fitting aperture of the securing segment ②.
- Carefully insert the pivot into the receptacle until it stops.
- Once the Light Head yoke pivot is in the LCH Spring Arm you are ready to install the securing segment ②.

Mounting the securing segment

1. Lubricate the securing segment ① with white grease.
2. Lubricate the pivot of the Light Head/Yoke Assembly or the Monitor Cradle with white grease.
3. Insert the Pivot on the Light Head/Yoke into the Spring Arm assuring the groove in the yoke pivot aligns with the securing segment slot in the arm. Once alignment is achieved, insert the securing segment ①.
4. Check that the securing segment ① is securely in place;
 - The Light Head must rotate freely.

Moving the segment securing device

5. Re-tighten the optional brake screw
6. Push the segment securing device ② backwards and screw it on using 1 Phillips recessed head screw ③.

Adjusting the vertical lift and the optional brake

7. Adjust the vertical lift of the Spring Arm as described in Section 5;
 - Mount the cover panels to the Spring Arm.

Mounting the LCH Spring Arm with Camera

Remove Screws
(x4)

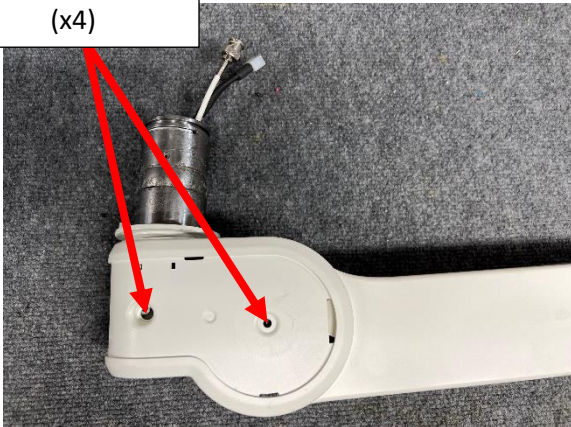


Figure 15: Preparing LCH Spring Arm with Camera - Screw Removal



Figure 16: Preparing LCH Spring Arm with Camera - Cover Removal



Figure 17: Mounting the LCH Spring Arm with Camera

Two people are required to mount the LCH Spring Arm with Camera. An equipment lift is highly recommended to avoid injury in lifting the Spring Arm into place.

1. Prepare the LCH Spring Arm with camera by removing all covers. To do this, remove the four screws securing the elbow covers and gently pull the two halves apart. With the elbow cover removed, the plastic covering running the length of the spring arm can now be pulled apart.
2. The LCH Spring Arm with camera can now be mounted to the central axis. Refer to Section 4 Mounting the L17 and LCH Spring Arm for instructions on how to safely mount the Spring Arm.

*** Risk of the Light Head dropping ***

If the 2 securing segments are not properly mounted, there is a risk of the Spring Arm with the Light Head dropping and causing serious injury. Check the 2 securing segments are securely in place:

- The Spring Arm must be inserted into the Extension Arm up to the end stop.
- The 2 securing segments must be inserted into the Extension up to the end stop such that they protrude into the groove on the Spring Arm pivot.
- The 2 latch pins must audibly snap into place and be on the same height after the installation.

Mounting the Light Head to the LCH Spring Arm with Camera

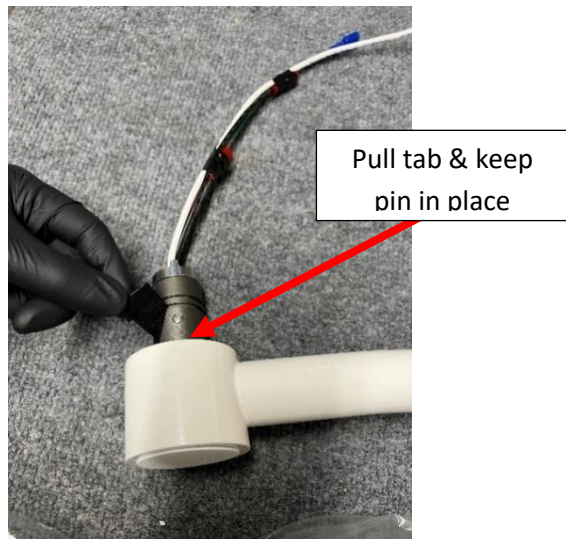


Figure 18: Prepare the Light Head to Mount to the LCH Spring Arm with Camera



Figure 19: LCH Light Head with Camera Install



Figure 20: LCH Light Head with Camera - Install Securing Segment

Two people are required to mount the LCH Light head with Camera. An equipment lift is highly recommended to avoid injury in lifting the Spring Arm into place.

1. Prepare the light head by removing the tape from the yoke pivot. Pull the tab on the tape being sure the pin stays in place.
2. Begin by inserting each of the four wires from the yoke one at a time, until all four connectors are clear.

Section 4

Positioning the Light

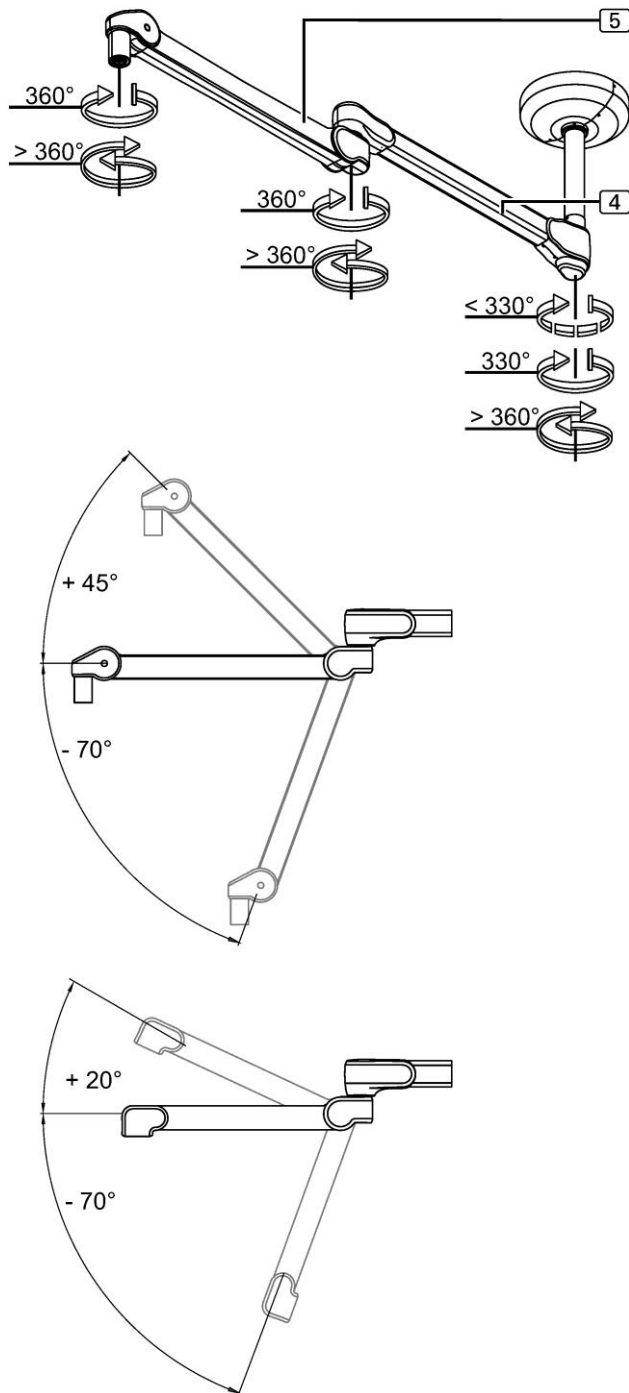


Figure 21: Positioning the Arms

Positioning the Arm System

The Figure illustrates the configuration example of the System Two LED central axis S1.

The Extension Arm [4], Spring Arm [5] and the Light Head or Monitor can be positioned easily. The swivel range and the vertical lift can be restricted through internal end stops.

- Arms with standard Light Heads have continuous rotation
- Arms with Monitor Cradles or with Light Heads with In-Light Cameras have rotational stops to prevent the wires from being damaged during use.

Swiveling the Arm System

*** Notice ***

To prevent damage to the Arm System;

- Do not hit the end stops hard
- Avoid collisions with other components.
- Slowly swivel the Light Head
- Depending on the individual version the swivel range ends at the internal end stops of the Extension Arm [4] and the Spring Arm [5].

Adjusting the Height of the Arm System

*** Notice ***

If the Light Head or Monitor is moved upwards, there is a risk that it could collide with other components.

- Prior to adjusting the height, check for potential risks of collision.
- Slowly adjust the height of the Light Head.
- The height adjustment is restricted by the internal end stops of the Spring Arm [5]. If the Extension Arm [4], the Spring Arm [5], the Light Head do not remain stable in the set position, the spring tension or brake force must be adjusted.

Section 5: Adjustments

Adjusting the Brakes for the Extension Arm

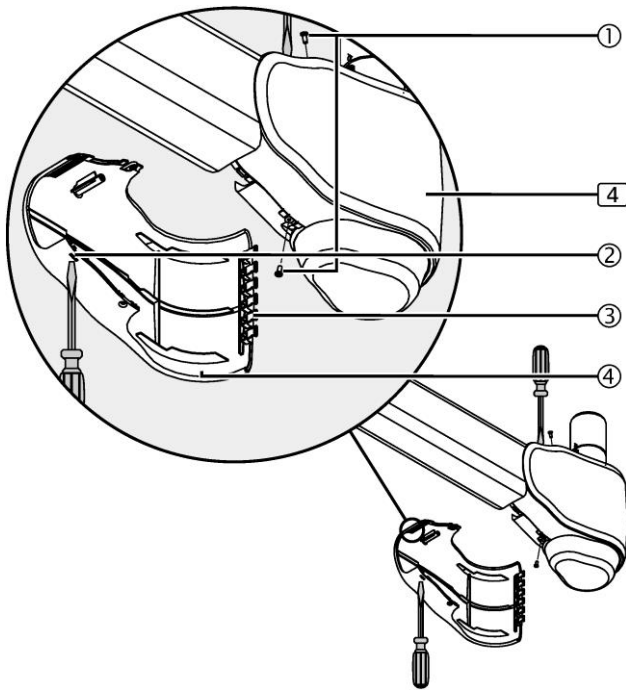


Figure 22: Dismantling the right-hand cover panels from the Extension Arm

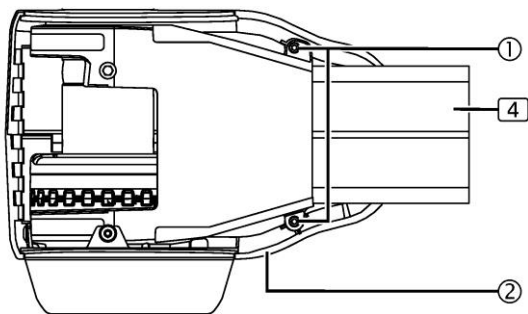


Figure 23: Dismantling the left-hand cover panel from the Extension Arm

To adjust the brakes, the cover panels must be dismantled from the corresponding Extension Arm [4].

The dismantling of the cover panels is described using the example of the System Two LED central axis S1. The installation procedure for further versions is identical.

Follow the safety instructions on Page 56.

Dismantling the cover panels on the right-hand side from the Extension Arm

1. Unscrew the 2 PT Torx screws ① from the top and bottom sides of the left-hand Extension Arm cover panel.
 2. Insert a suitable slotted screwdriver into the fitting aperture in the right-hand Extension Arm cover from below and disengage it by gently pushing it in.
 3. Insert a suitable slotted screwdriver into the fitting aperture of the left-hand Extension Arm from above and disengage it by gently pushing it in.
 4. Disengage the right-hand Extension Arm cover panel ④ from the edge of the connection of the 2 Extension Arm cover panels.
 5. Gently remove the right-hand Extension Arm cover panel from the Extension Arm [4].
- To do this, gently disengage the latches ③.

Dismantling the left-hand cover panel from the Extension Arm

1. Unscrew the 2 PT Torx screws from the left-hand Extension Arm panel.
2. Gently remove the left-hand Extension Arm cover ② from the Extension Arm [4].

Adjusting the Brakes for the Extension Arm (cont)

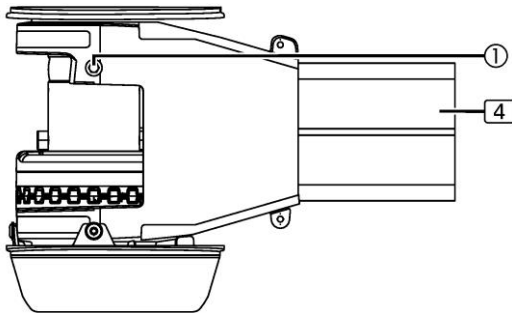


Figure 24: Adjusting the Extension Arm brakes

The adjustments of the brakes are illustrated using the example of the System Two LED central axis S1 version. The installation procedure for further versions is identical.

Follow the safety instructions on Page 56.

Position and number of brake screws

- Each Extension Arm [4] is fitted with 2 brake screws ① positioned opposite to one another.

Adjusting the brakes

- Adjust the brakes such that the Extension Arm 4 remains stable in any set position and can still be conveniently adjusted.
- Use an Allen key (size 5).

To increase the brake force

- Insert the Allen key into the brake screws and alternately turn with the same number of revolutions in the clockwise direction as illustrated in the Figure.

To reduce the brake force

- Insert the Allen key into the brake screws and alternately turn with the same number of revolutions in the counterclockwise direction as illustrated in the Figure.

Perform a function test.

Adjusting the Brakes for the Extension Arm (cont)

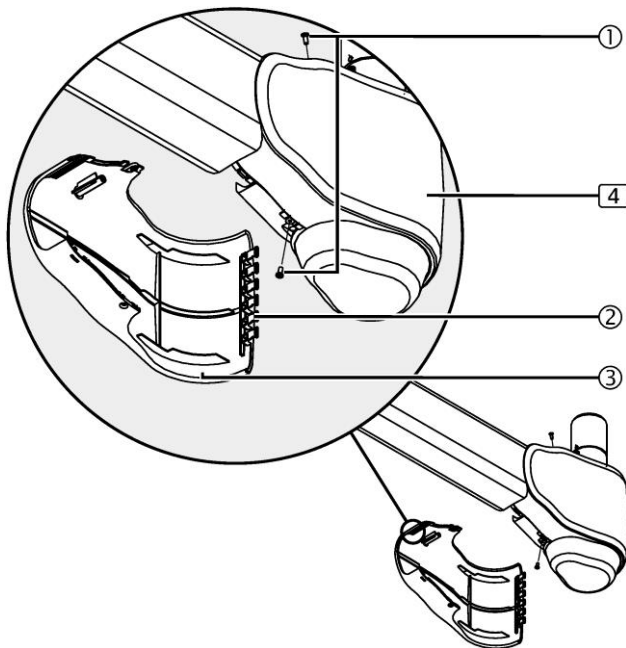


Figure 25: Mounting the right-hand cover panel to the Extension Arm

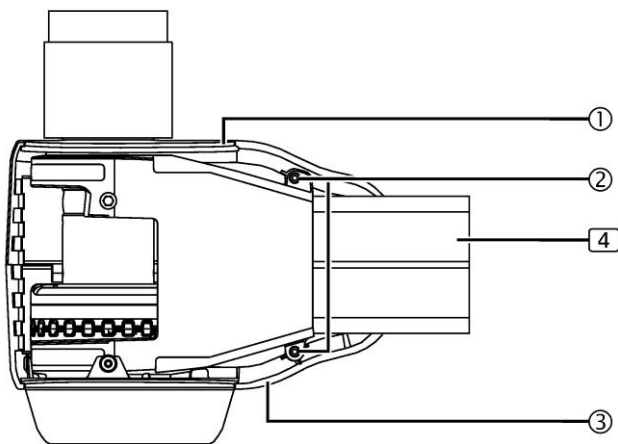


Figure 26: Mounting the left-hand cover panel to the Extension Arm

Mounting the right-hand cover panel to the extension

Mounting the rear cover panels to the Extension Arm

The mounting of the cover panels is illustrated using the example of the System Two LED central axis S1 version. The installation procedure for further versions is identical.

Follow the safety instructions on Page 56.

Mounting the left-hand cover panel to the Extension Arm

1. Position the left-hand Extension Arm cover panels (3) on the Extension Arm such that the top cover panel (1) sits in the Extension Arm cover (3).
2. Tighten the left-hand Extension Arm cover panel (3) using 2 PT Torx screws (2).

Mounting the right-hand cover panel to the Extension Arm

1. Place the right-hand Extension Arm cover panel (3) into the left-hand Extension Arm cover panel.
- Make sure that the rear latches (2) engage with each other in a 90° angle and then close the Extension Arm cover panels like a hinge.
2. Screw the right-hand Extension Arm cover panel (3) onto the top and bottom sides of the left-hand Extension Arm cover panel using 2 PT Torx screws (1).
3. Check that the Extension Arm cover panels are securely in place;
- The Extension Arm cover panels must engage tightly with each other without gaps.
- The 2 PT Torx screws (1) – must be tightened.

Adjusting the Brakes for the Spring Arm

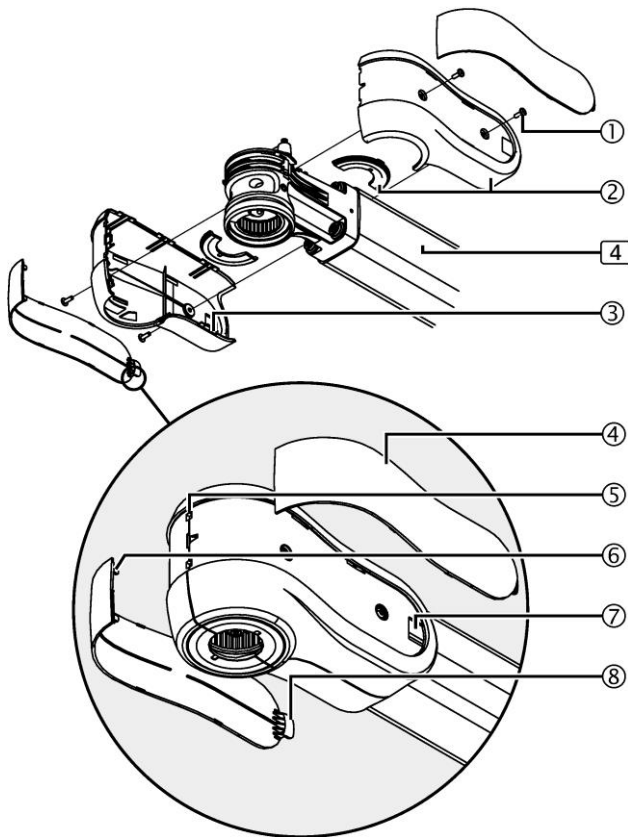


Figure 27: Dismantling the decorative caps and socket covers

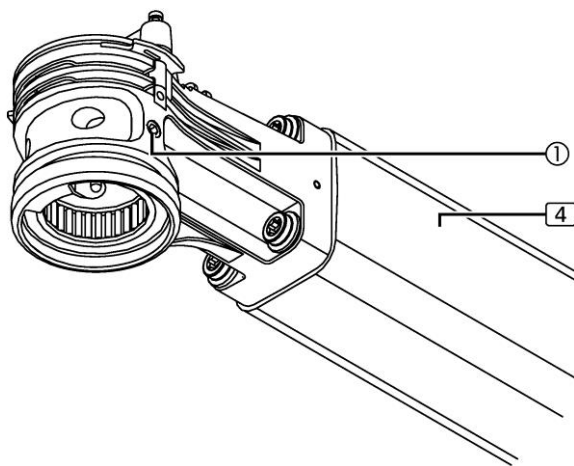


Figure 28: Adjusting the brakes

The above figures show simplified illustrations of the Extension Arm without the Spring Arm.

To adjust the brakes the front socket covers must be dismantled from the corresponding Extension Arm [4].

Follow the safety instructions on Page 56.

Dismantling the decorative caps

1. Simultaneously push the 2 decorative caps (4) forwards in order to route the 2 straps (8) out of the cutouts (7).
2. Gently disengage the locking pins (6) on the decorative caps (4).
3. Gently route the decorative caps (4) out of the 2 holes (5) on the socket covers (2) and remove them.

Dismantling the socket covers

1. Unscrew 2 cross recessed head screws (1) from the right- and left-hand socket cover (2).
2. Gently disengage the locking pins (3) and remove the right- and left and socket cover with optional cover plates (2).

Adjusting the brakes

Position and number of brake screws

- Each Extension Arm [4] is fitted with 2 brake screws (1) positioned opposite to one another.

Adjusting the brakes

- Adjust the brakes such that the Spring Arm remains stable in any set position and can still be conveniently adjusted.

Tool to be used

- Use an Allen key (size 5) to increase the brake force
- Insert the Allen key into the brake screws (1) and alternately turn with the same number of revolutions in the clockwise (+) direction as illustrated in the Figure.

To reduce the brake force

- Insert the Allen key into the brake screws (1) and alternately turn with the same number of revolutions in the counterclockwise (-) direction as illustrated in the Figure.

Perform a functionality test.

Adjusting the Brakes for the Spring Arm (cont)

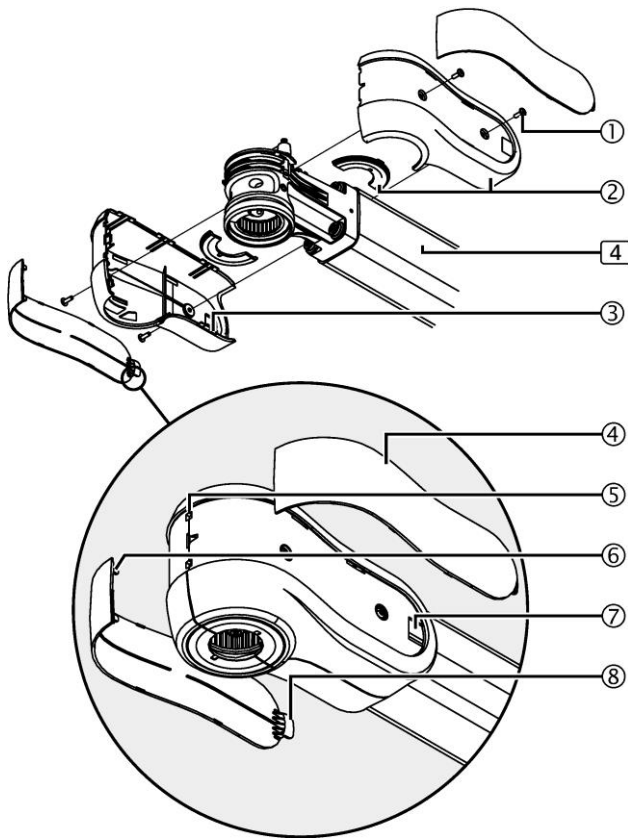


Figure 29: Mounting the socket covers and decorative caps to the Extension Arms

The Figure shows a simplified illustration with only the Extension Arm [4] without Spring Arm.

Mounting the socket covers to the Extension Arm

1. Screw the left-hand socket cover with optional cover plate ② onto the Extension Arm [4] using 2 cross recessed head screws ①.
2. Place the right-hand cover panel with optional cover plate onto the left-hand socket cover ② such that all the locking pins ③ engage with each other and screw it onto the Extension Arm [4] using 2 cross recessed head screws ①.
3. Check that the socket cover with optional cover plates is securely in place;
 - The socket covers with optional cover plates ② must tightly engage with each other without gaps and be tightened with 2 cross recessed head screws ①.

Mounting the decorative caps

***** Notice *****

To prevent damage to the decorative caps;

- The mounting steps described below must be executed in the correct order:
1. Attach the locking mechanisms ⑥ of the decorative caps ④ into the 2 fittings ⑤ on the socket covers ②.
 2. Fold the decorative caps ④ towards the Extension Arm [4] and insert the straps ⑧ into the cutout ⑦ on the socket covers ②.
 3. Check that the decorative caps ④ are securely in place;
 - The decorative caps ④ must securely engage in the socket covers ② without gaps.

Adjusting the Comfort Stop on the Extension Arm

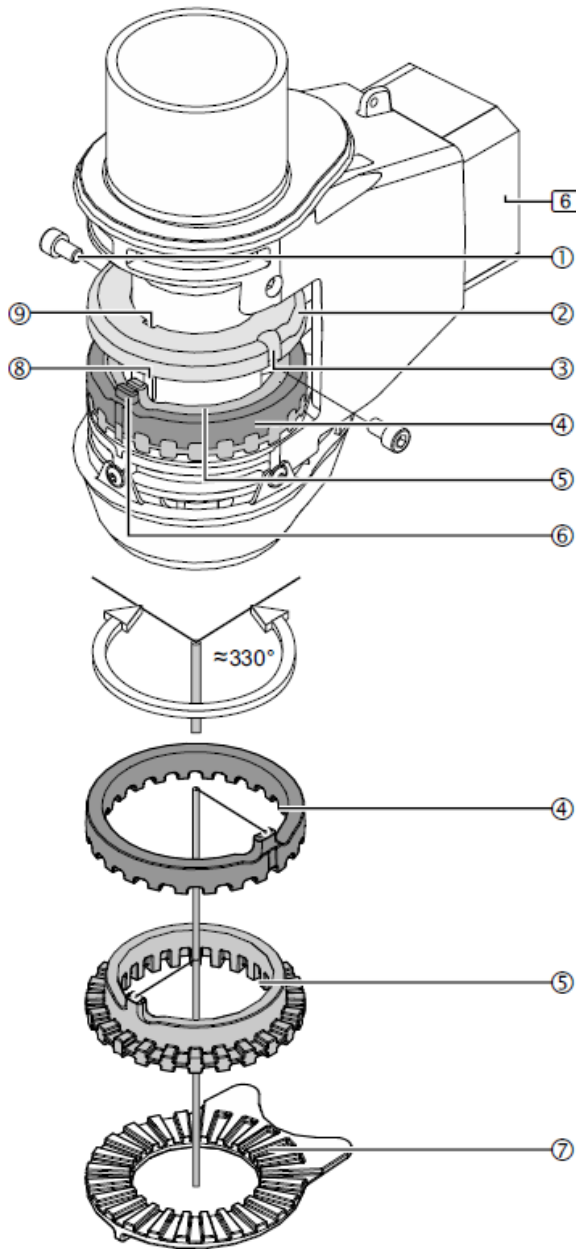


Figure 30: Adjusting the Comfort Stop end stop on the Extension Arm

The adjustment of the comfort end stop is illustrated using the example of the Single Extension Arm. The procedure for the multiple arm versions is identical. The comfort end stop can be separately adjusted for each Extension Arm. The minimum, reduced swivel range is 15°.

Dismantling the rear cover panels from the Extension Arm.

4. Dismantle the Extension Arm covers as described on Page 40 and the following pages.

Prepare the adjustment

5. Rotate the Extension Arm [6] such that the 2 Allen Screws are accessible.
6. Unscrew the 2 Allen screws ①.
7. Rotate the Extension Arm [6] in position such that the recess ③ in the end stop ring ② is visible.

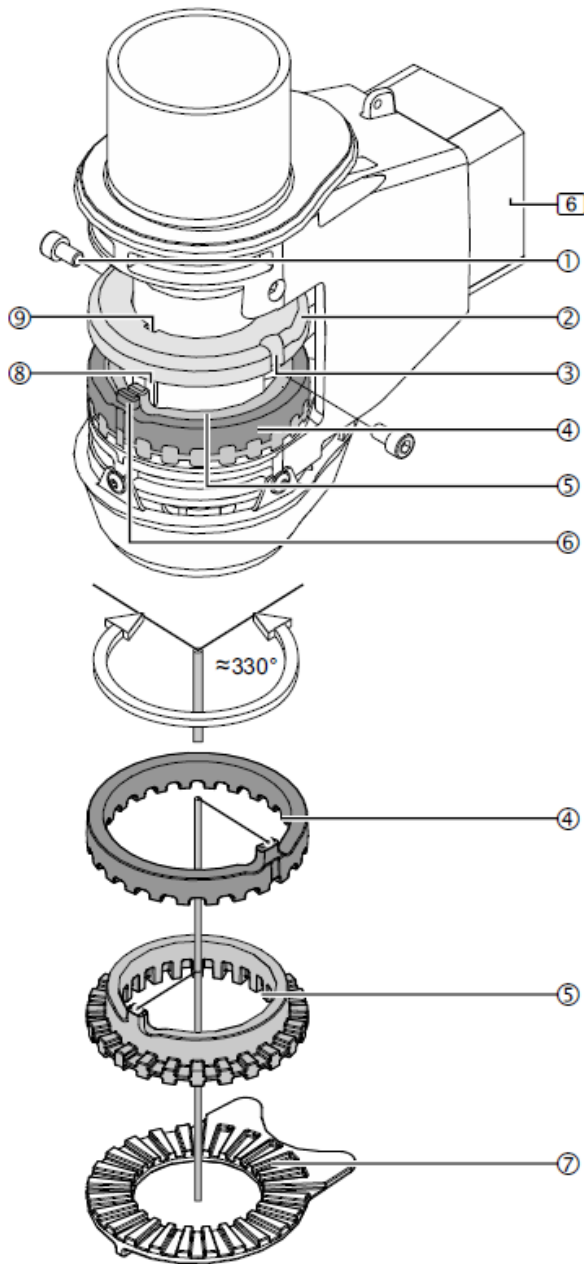
Restricting the clockwise rotation of the Extension Arm

The swivel range of the Extension Arm [6] is defined by the position of the 3 end stops ② / ④ / ⑤ engaged tightly with each other.

8. Push the end stop ring ② out of the 2 fit-in keys (8) towards the top and slightly rotate it such that it is positioned on top of the fit-in keys ⑧.
9. Rotate the Extension Arm [6] into the first end stop position.
10. Lift the end stops ④ / ⑤ together and rotate them in position such that the 2 end stop pins ⑥ are positioned on the right-hand side of the recess ③ in the end stop rings.
11. Lower the end stops ④ / ⑤ such that the teeth protrude into the fixed compensating disc ⑦.
12. Rotate the end stop ring ② slightly backwards in order to be able to insert the groove ⑨ of the end stop ring ② into the 2 fit-in keys ⑧ and lower the end stop ring ② once again.
13. Next, rotate the Extension Arm [6] clockwise in order to check the end stop position.
 - Repeat the steps in order to readjust the end stop if required.

Continue on the next page

Adjusting the Comfort Stop on the Extension Arm- (cont)



The swivel range of the Extension Arm [6] is defined by the position of the 3 end stops ② / ④ / ⑤ engaged lightly with each other.

14. Push the end stop ring ② out of the 2 fit-in keys ⑧ towards the top and slightly rotate it such that it is positioned on top of the fit-in keys ⑧.
15. Rotate the Extension Arm [6] into the second end stop position desired.
16. Lift the end stop ④ and rotate it in position such that the end stop pin ⑥ sits to the left of the recess (3) of the end stop ring ②.
17. Lower the end stop ④ such that the teeth protrude into the fixed compensating disc ⑦.
18. Rotate the end stop ring ② slightly backwards in order to be able to insert the groove (9) of the end stop ring ② into the 2 fit-in keys ⑧ and lower the end stop ring ② once again.
19. Next, rotate the Extension Arm [6] anti-clockwise in order to check the end stop position.
 - Repeat the steps in order to readjust the end stop if required.

Reversing the movement range by 180°

20. Since the 2 grooves ⑧ of the end stop ring ② sit opposite to each other, the end stop ring can be staggered by 180°.
 - By changing the position of the end stop ring ② its movement range is reversed.
21. Screw in and tighten 2 Allen screws ①.

Mounting the rear cover to the Extension Arm

22. Mount the rear cover panels to the Extension Arm as described on Page 40.

L21/MD21 Spring Arm

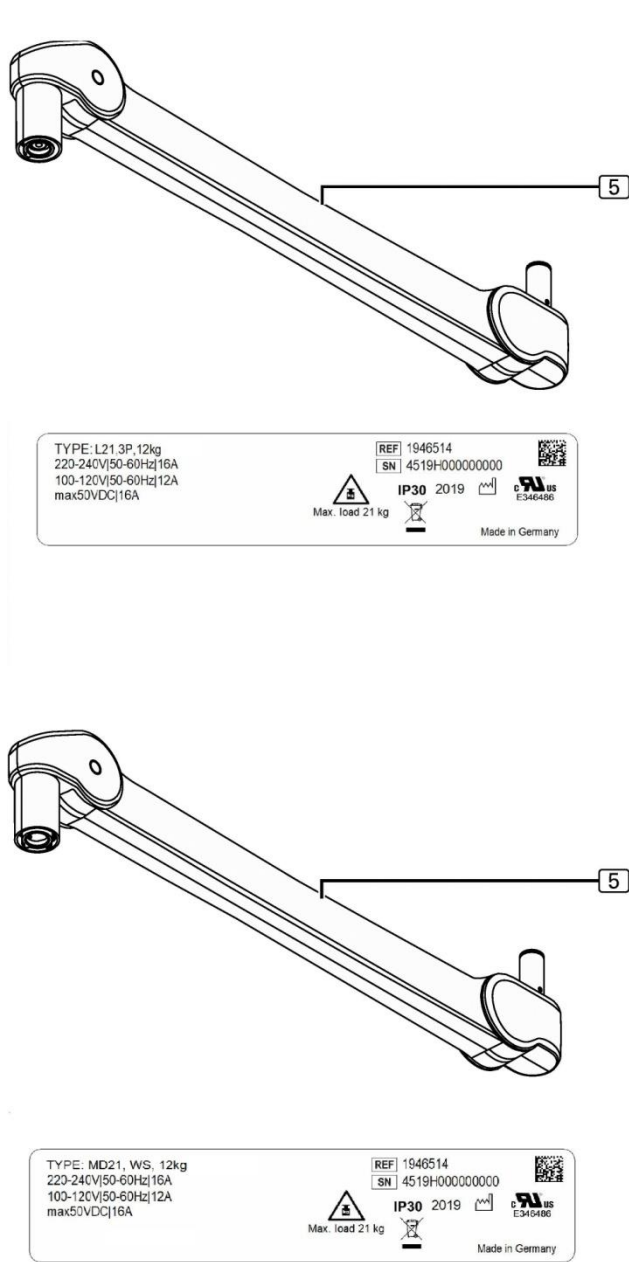


Figure 31: Spring Arm L21/MD21

System Two LED Spring Arm L21/MD21

Identify the version of the Spring Arm [5] mounted according to the information on the rating plate.

The adjustment of the Spring Arms L21/MD21 is identical.

You can identify your System Two LED Spring Arm L21 mounted by the TYPE designation: L21.

You can identify your System Two LED Spring Arm MD21 mounted by the TYPE designation: MD21.

The rating plate is attached to the top side of the Spring Arm [5].

Adjusting the Spring Tension

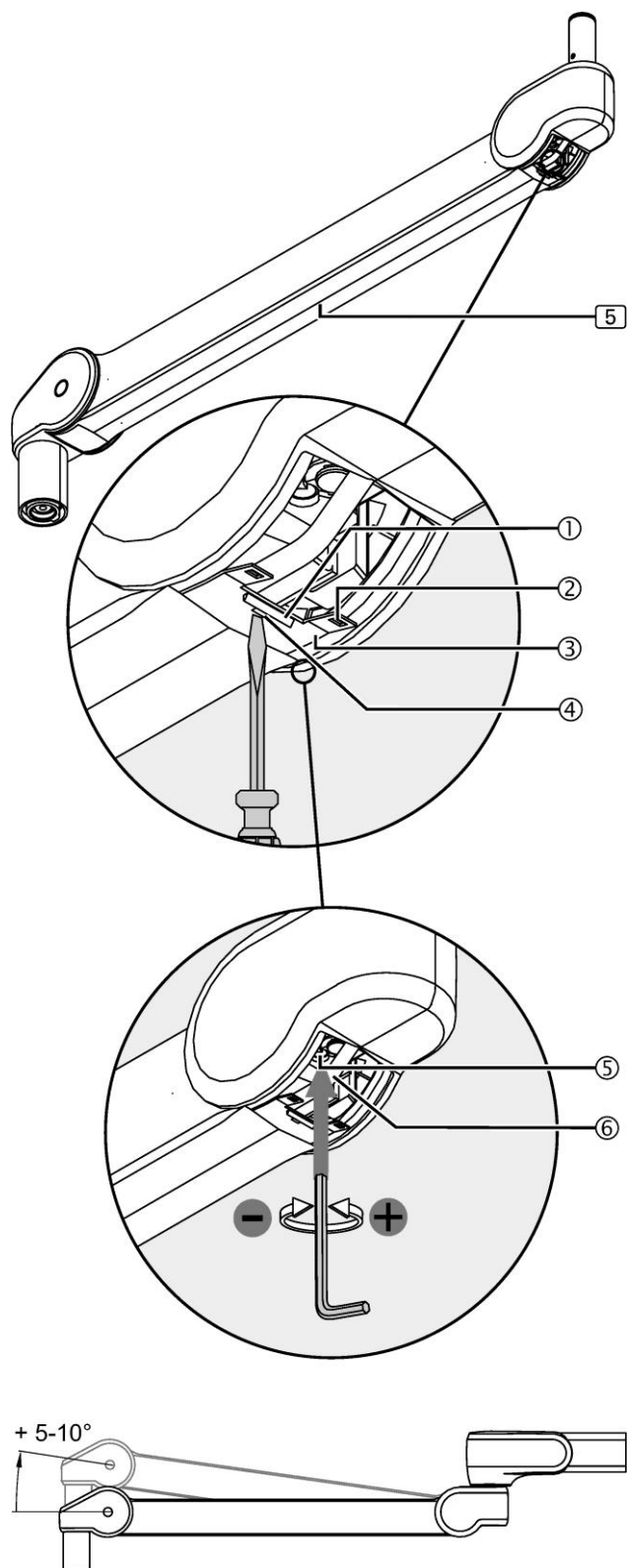


Figure 32: Adjusting the spring tension

The Spring Arm [5] is equipped with a spring which compensates the weight of the Light Head or the weight of a monitor.

Adjust the spring tension such that the Spring Arm with remains stable in any set position.

Follow the safety instructions on Page 56.

Disengaging the cover plate

1. Insert a suitable slotted screwdriver into the mounting aperture (4)
2. Slightly push the slotted screwdriver upwards and route the snap-in hook (1) out of the cover.
3. Push the slotted screwdriver with the cover plate (3) backwards.

Setting

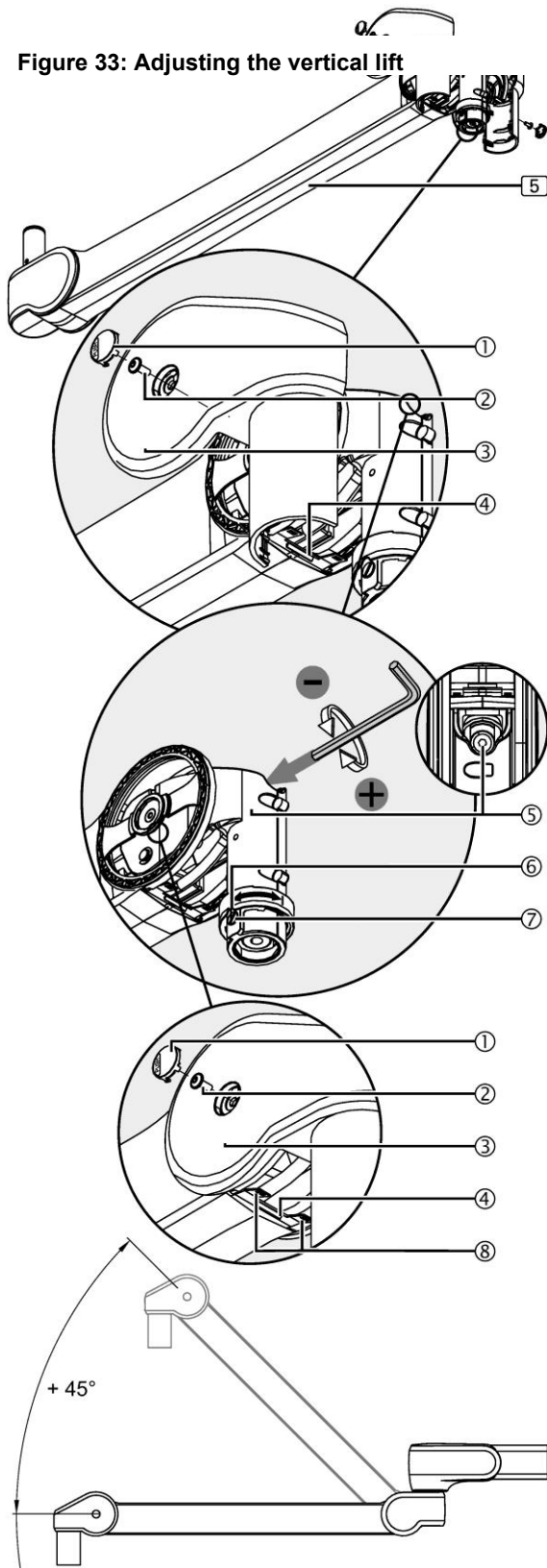
- Use an Allen key (size 5).
- 4. Gently route any electric cables (6) towards the side and insert the Allen key into the adjustment aperture (5).
- Route the Spring Arm approximately +5° to +10° upwards in order to relieve the adjustment screw. If the Spring Arm moves down, the spring tension is too low
- Turn the Allen key to the left (counter-clockwise) as illustrated in the Figure. If the Spring Arm moves up, the spring tension is too high
- Turn the Allen key to the right (clockwise) as illustrated in the Figure.
- 5. Perform a function test.

Engaging the cover plate

6. Push the cover plate (3) forward and manually insert the 2 latches (2) into the cover panel.
7. Insert the slotted screwdriver into the hole (4), push the cover plate (3) slightly upwards and route the snap-in hook (1) into the cover panel.
8. Move the Spring Arm up & down and check that the cover plate (3) is securely in place.
- The snap-in hook (1) must sit in the cover panel.
- The cover plates must slide in the lateral guides without being trapped.

Adjusting the Vertical Lift

Figure 33: Adjusting the vertical lift



The vertical lift can be adjusted from approximately 0° to + 45° in the upwards direction.

Follow the safety instructions on Page 56.

Dismantling the cover panels and moving the cover plates

1. On each side push the PUSH button ① labeled "PUSH" and accept.
2. Unscrew 1 cross recessed head screw ② from each side.
 - Use a Torx T10 screwdriver.
3. Remove 1 cover panel ③ from each side.
 - To do this, gently disengage the latches.
4. Push the upper and lower cover plate ④ backwards.

Setting

- Use an Allen key (size 5).
- 5. Insert the Allen key into the adjustment hole ⑤.
- Slightly pull down the Spring Arm in order to relieve the adjustment screw in the Spring Arm.

To reduce the swivel range

- Turn the Allen key to the left (counter-clockwise) as illustrated in the Figure.

To extend the swivel range

- Turn the Allen key to the right (clockwise) as illustrated in the Figure.
6. Perform a function test.

Mounting the cover panels

7. Rotate the cutout in the segment securing device ⑥ such that it laterally protrudes over the optional brake screw or brake screw aperture ⑦.
8. Place 1 cover panel ③ on each side and screw it on using 1 cross recessed head screw ②.
- To do this, gently engage the latches.
9. Insert one PUSH button ① on each side such that it is flush with the cover panels ③.
- The PUSH button ① must not protrude.

Engaging the cover plates

10. Push the upper and lower cover plates ④ forwards and manually insert 2 latches ⑧ each into the cover panel's ③.
11. Using a suitable slotted screwdriver, push the cover plates' ③ further into the cover panels ③ until they audibly click into place.
 - The latches ⑧ of the cover plates ④ have now snapped into place.
12. Move the Spring Arm up and down and check that the cover plates' ④ are securely in place.
 - The cover plates must slide in the lateral guides without being trapped.

Adjusting the Optional Brake

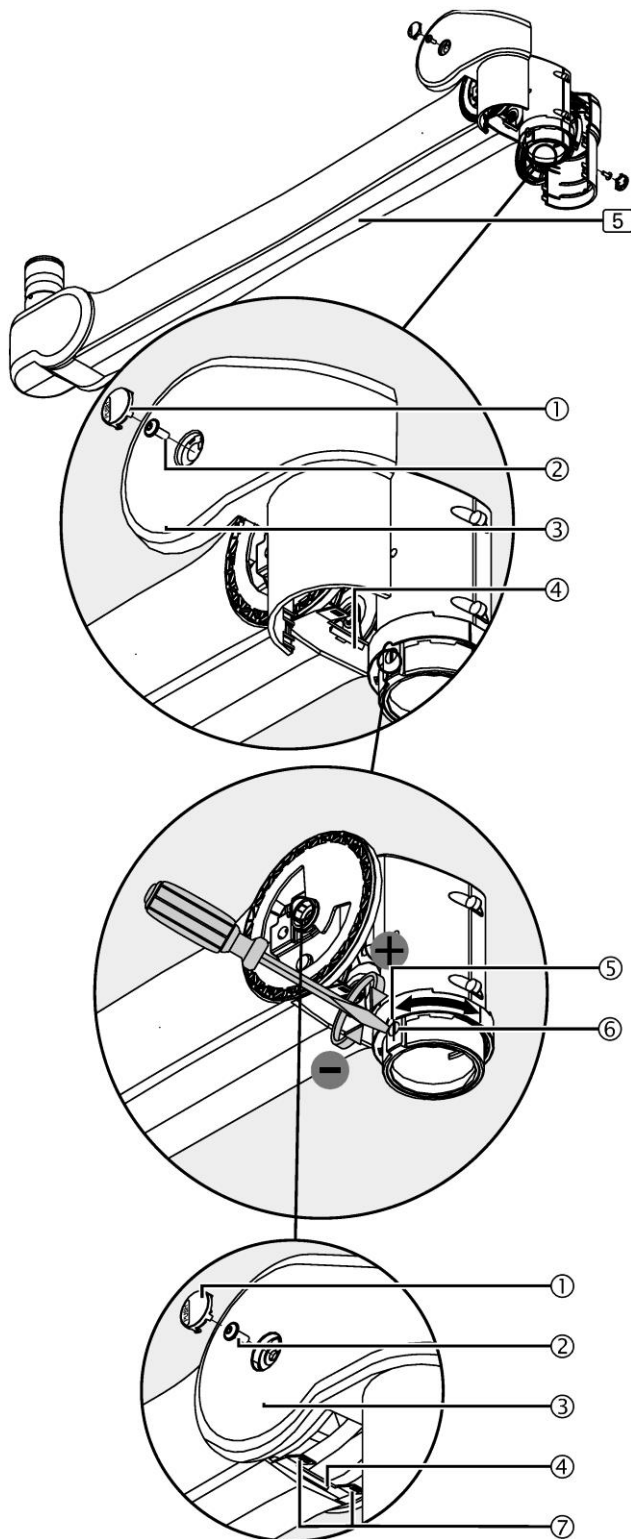


Figure 34: Adjusting the optional brake

Adjust the brakes such that the Light Head or Monitor remains stable in any set position and can still be conveniently adjusted.

Follow the safety instructions on Page 56.

Dismantling the cover panels and moving the cover plates

1. On each side push the PUSH button ① labeled "PUSH" and accept.
2. Unscrew 1 cross recessed head screw ② from each side.
 - Use a Torx T10 screwdriver.
3. Remove 1 cover panel ③ from each side.
 - To do this, gently disengage the latches.
4. Push the upper and lower cover plate ④ backwards.

Setting

- Use a suitable slotted screwdriver.

To increase the brake force

- Insert the slotted screwdriver into the brake screw ⑥ as illustrated in the Figure and turn it in the clockwise direction.

To reduce the brake force

- Insert the slotted screwdriver into the brake screw ⑥ as illustrated in the Figure and turn it in the counter-clockwise direction.
5. Perform a function test.

Mounting the cover panels

6. Rotate the cutout in the segment securing device ⑤ such that it laterally protrudes over the optional brake screw or brake screw aperture ⑥.
7. Place 1 cover panel ③ on each side and screw it on using 1 cross recessed head screw ②.
 - To do this, gently engage the latches.
8. Insert one PUSH button ① on each side such that it is flush with the cover panels ③.
 - The PUSH button ① must not protrude.

Engaging the cover plates

9. Push the upper and lower cover plates ④ forwards and manually insert 2 latches ⑦ each into the cover panels ③.
10. Using a suitable slotted screwdriver, push the cover plates ④ further into the cover panels ③ until they audibly click into place.
 - The latches ⑦ of the cover plates ④ have now snapped into place.
11. Move the Spring Arm up and down and check that the cover plates ④ are securely in place.
 - The cover plates must slide in the lateral guides without being trapped.

Adjusting the Vertical Lift – LCH Arm

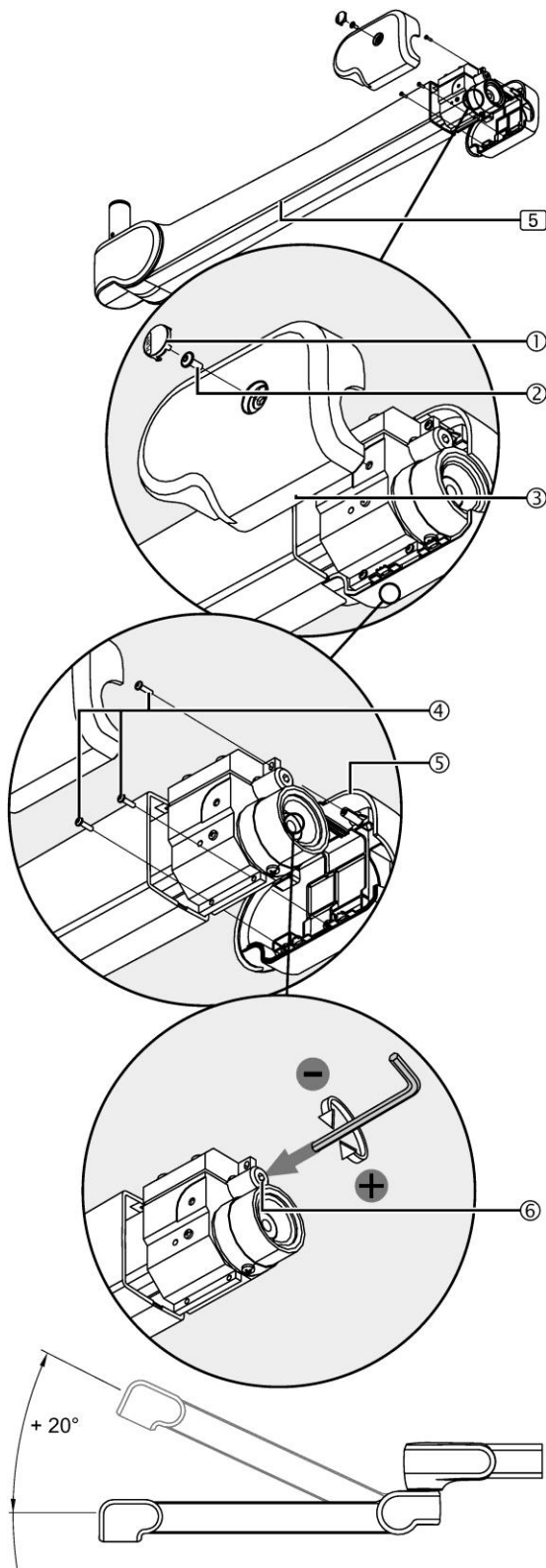


Figure 35: Adjusting the vertical lift

The vertical lift can be adjusted from approx. 0 to +20° in the upwards direction at maximum carrying load. It can be adjusted to up to +45° in the case of lower carrying loads.

Follow the safety instructions on Page 56.

Dismantling the left-hand cover panel

1. On the left-hand side push the PUSH button (1) labeled "PUSH" and accept.
2. Unscrew one cross recessed head screw (2).
 - Use a Torx T10 screwdriver.
3. Remove the cover panel (3).
 - To do this, gently disengage the latches.

Dismantling the right-hand cover panel

4. Unscrew the 3 PT Torx screws (4).
 - Use a Torx T10 screwdriver.
5. Remove the right-hand cover panel (5).

Setting

- Use an Allen key (size 5)
- 6. Insert the Allen key into the adjustment hole (6).
- Slightly pull down the Spring Arm in order to relieve the adjustment screw in the Spring Arm.

To reduce the swivel range

- Turn the Allen key to the left (counter-clockwise) as illustrated in the Figure.

To extend the swivel range

- Turn the Allen key to the right (clockwise) as illustrated in the Figure.
7. Perform a function test.

Mounting the right-hand cover panel

8. Place the right-hand cover panel (5) and screw it on using 3 PT Torx screws (4).

Mounting the left-hand cover panel

9. Place the left-hand cover panel (3) and screw it on using 1 cross recessed head screw (2).
 - To do this, gently engage the latches.
10. Insert the PUSH button (1) such that it is flush with the cover panel (3).
 - The PUSH button (1) must not protrude.

Adjusting the Optional Brake – LCH Arm

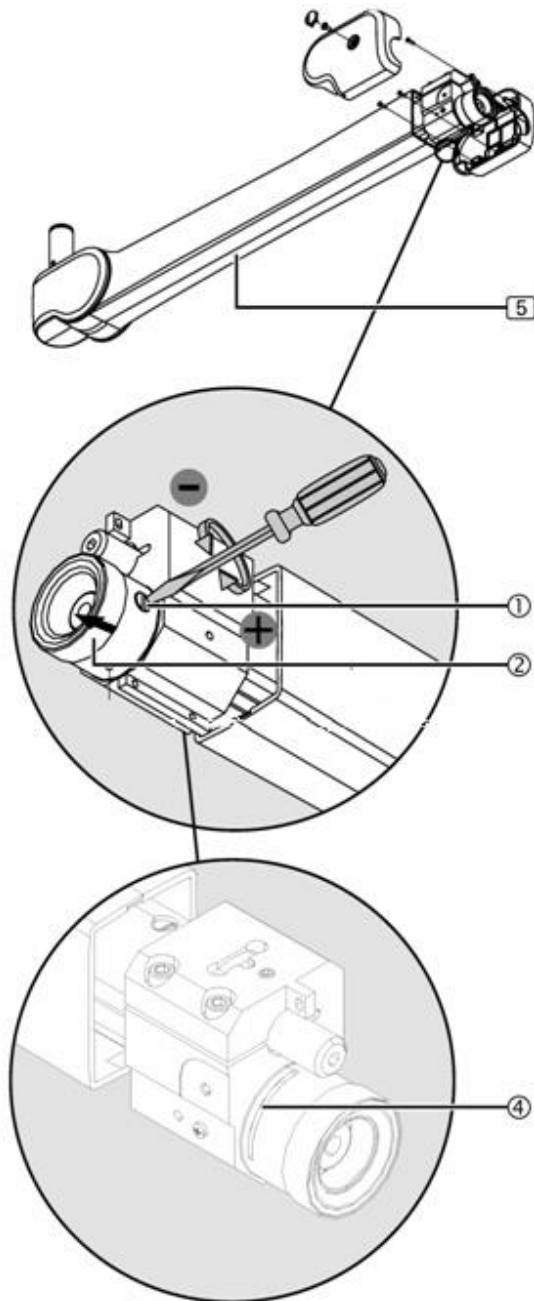


Figure 36: Adjusting the optional brake

Adjust the brakes such that the Light Head or Monitor remains stable in any set position and can still be conveniently adjusted.

Follow the safety instructions on Page 56.

Dismantling the cover panels

1. Dismantle the cover panels as previously described

Moving the segment securing device

2. Push the segment securing device (2) forwards until the brake screw is accessible.

Setting

- Use a suitable slotted screwdriver.

To increase the brake force

- Insert the slotted screwdriver into the brake screw (1) as illustrated in the Figure and turn it in the clockwise direction.

To reduce the brake force

- Insert the slotted screwdriver into the brake screw (1) as illustrated in the Figure and turn it in the counter-clockwise direction.

3. Perform a function test.

Moving the segment securing device

4. Push the segment securing device backwards and screw it on using 1 Phillips recessed head screw.
- Make sure that the segment securing device does not protrude from the fitting aperture (4).

Mounting the cover panels

5. Re-mount the cover panels as illustrated.

Adjusting the Yoke Brake

In the event that the Light Head will not maintain its position, you can apply friction to the rotation by using the Yoke Rotational Brake. On the Double Yoke version, there are two brakes and on the Single Yoke version (LCH), there is one brake. Turn the brake clockwise to increase the resistance on the Light Head Rotation. Only tighten enough to maintain position.

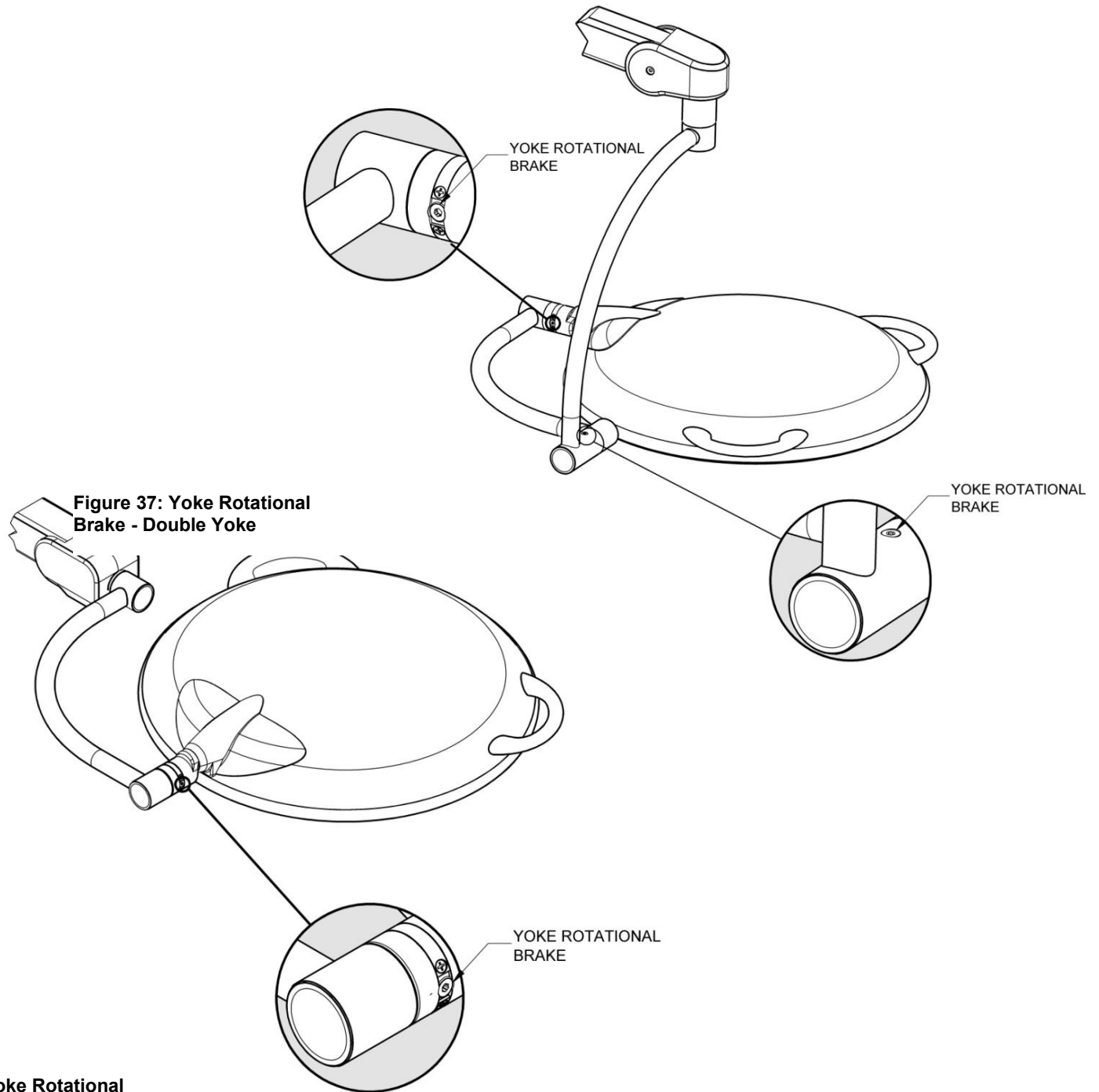


Figure 30: Yoke Rotational Brake - Single Yoke

Installation and Removal for the Sterilizable Handle Assembly (Camera Lights only)

Before the light can be used, the Sterilizable Handle Assembly must be installed.

The D2C comes equipped with an interchangeable Sterilizable Handle Assembly. The available interchangeable options are the Sterilizable Handle Assembly and a HD Camera Assembly.

To install the Sterilizable Handle Assembly it is first necessary to remove the plastic Sterilizable Handle, then turn the mounted light head so that the LED's face vertically towards the ceiling. Position the Handle Assembly so that the alignment pins align with the corresponding alignment holes in the light head. Using one hand to prevent the light head from moving gently push the Handle Assembly until it is firmly inserted into the light head. Then fasten the three captive screws and reattach the plastic Sterilizable Handle. The light head is now ready to use.

To remove the Sterilizable Handle Assembly, reverse the above sequence.

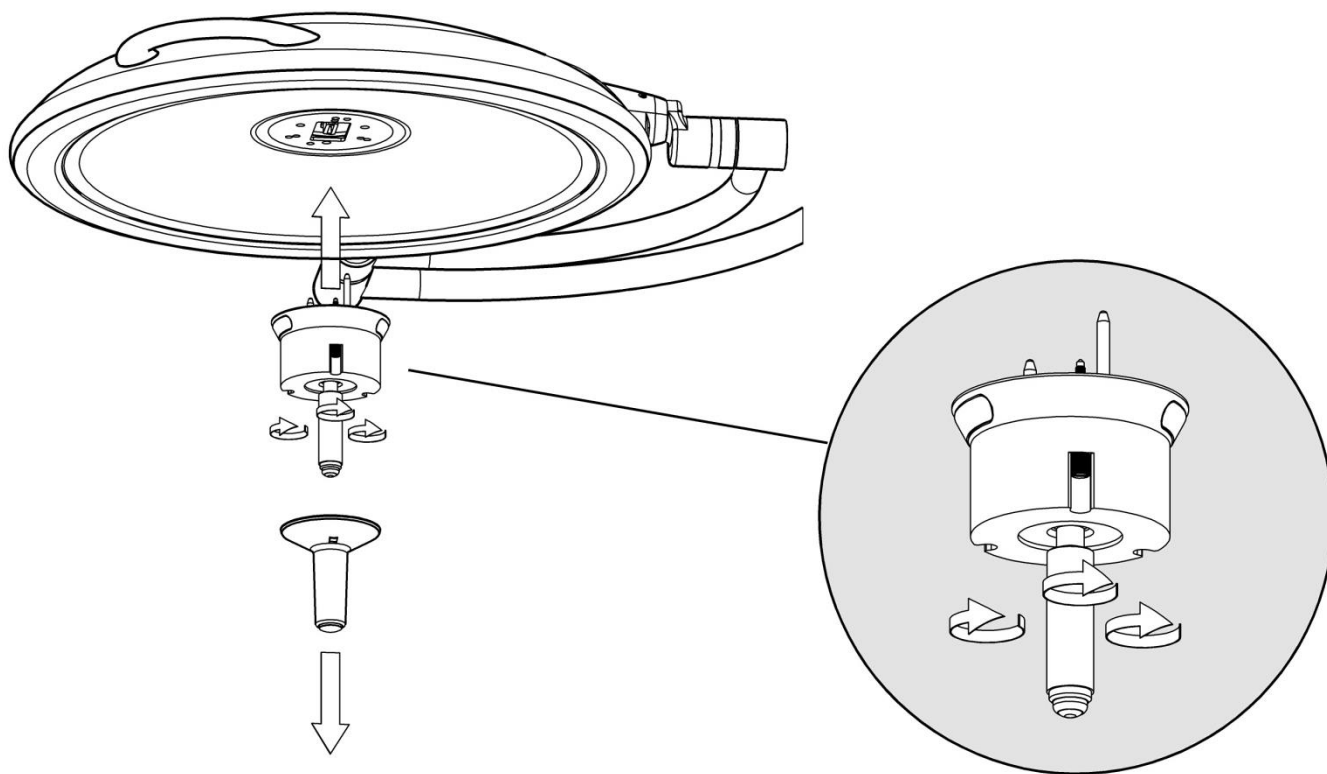


Figure 38: Attaching the Sterilizable Handle

Installation and Removal for the HD Camera Assembly (Camera Lights only)

To install the HD Camera Assembly it is first necessary to remove the Sterilizable Handle Assembly as listed above. Once the Sterilizable Handle Assembly has been removed and the light head has the LED's facing vertically towards the ceiling, remove the outer housing on the camera by pushing the retaining ball and sliding the outer housing off of the Camera Assembly. Then position the Camera Assembly so that the alignment pins align with the corresponding alignment holes in the light head. Using one hand to prevent the light head from moving gently push the Camera Assembly until it is firmly inserted into the light head. Then fasten the three captive screws and reinstall the camera outer housing (a click will be heard when the housing is locked in place). The camera is now ready to use. See Wall Control Supplement for camera controls

NOTE: The camera is a delicate instrument and must be handled with caution.

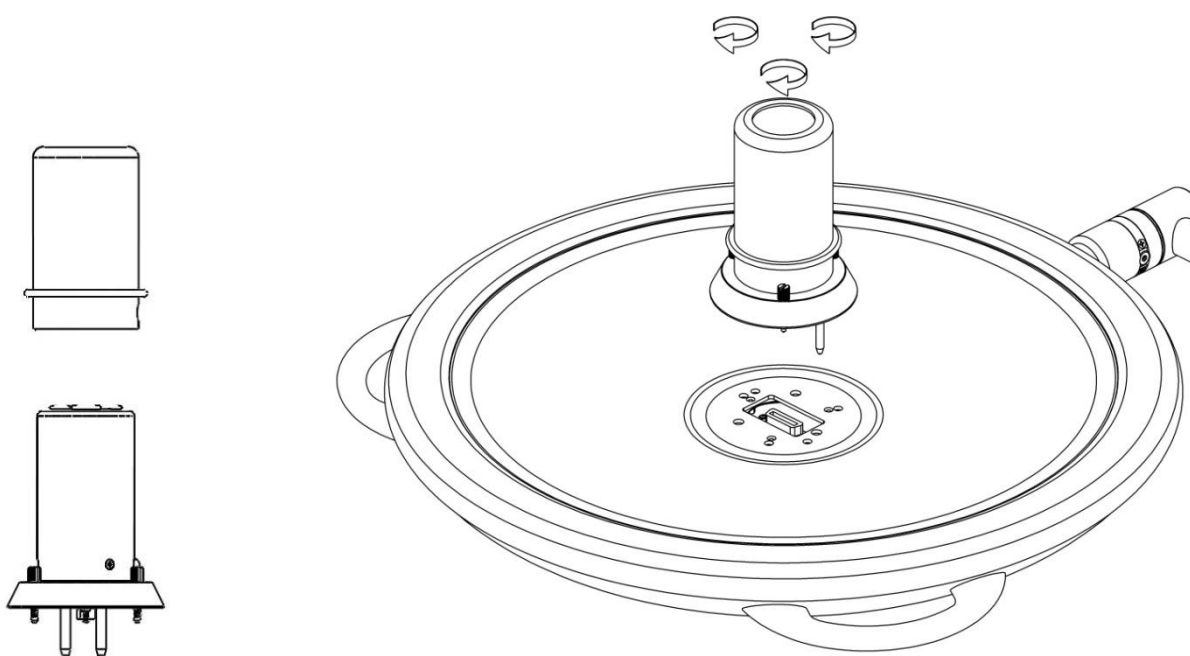


Figure 39: Camera Assembly (D2C only)

Figure 40: Inserting Camera Assembly (D2C only)

Installation and Removal for the 4K Camera Assembly (Camera Lights only)

To install the 4K Camera Assembly it is first necessary to remove the Sterilizable Handle Assembly as listed above. Once the Sterilizable Handle Assembly has been removed and the light head has the LED's facing vertically towards the ceiling, then position the Camera Assembly so that the alignment pins align with the corresponding alignment holes in the light head. Using one hand to prevent the light head from moving gently push the Camera Assembly until it is firmly inserted into the light head. Then fasten the three captive screws. The camera is now ready to use. See Wall Control Supplement for camera controls

NOTE: The camera is a delicate instrument and must be handled with caution.



Figure 41: Camera Assembly (D2C only)

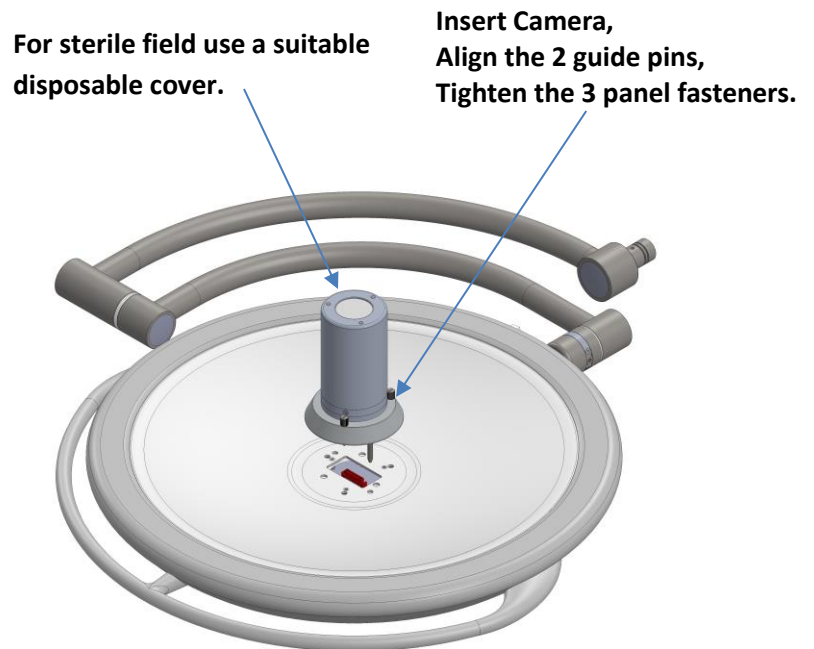


Figure 42: Inserting Camera Assembly (D2C only)