

## Installation Instructions Part 2 – Pendant system [en]

Navigator Lift™ 180 Single, Navigator Lift™ 180 Dual, Navigator Lift™ XL 180 Dual



A member of the  
Medical Illumination International Group

**Dear assembly operator,**

please read these Installation Instructions very carefully, and in particular Chapter 2, "Safety Instructions" which includes important safety information. Observe the safety instructions and requirements set out in these Installation Instructions.

- |   |   |
|---|---|
| Service technician qualification requirements     | <ul style="list-style-type: none"> <li>• These Installation Instructions are intended for trained service technicians.</li> <li>• The Nuvo pendant system may only be installed by Nuvo service technicians or authorised service personnel trained by Nuvo.</li> </ul>   |
| Inspections to be performed prior to installation | <ul style="list-style-type: none"> <li>• The load bearing capacity of the ceiling or the wall must be checked by a structural analyst and confirmed by means of an acceptance certificate.</li> <li>• The electrical installations in the corresponding room must comply with the requirements of the applicable national and international regulations.</li> </ul>   |
| Carrying out the installation                     | <ul style="list-style-type: none"> <li>• The electrical connection of the appliance to the mains may only be performed by a qualified electrician whilst the appliance is disconnected at all poles.</li> <li>• The steps described in these Installation Instructions must be followed for installation. In the event of damage to the appliance, installation work must be discontinued.</li> <li>• The safety, reliability and performance of the appliance are only assured if genuine parts from Nuvo are used.</li> <li>• If you encounter specific problems not covered in sufficient detail by these Installation Instructions, please contact your supplier immediately for your own safety and the safety of your customers.</li> </ul> |
| Unauthorised modifications or conversions         | <ul style="list-style-type: none"> <li>• Unauthorised modifications or conversions to the appliance are not permitted for safety reasons. No modification or conversion may be performed without authorization. Otherwise, the manufacturer's warranty for the appliance will be void. The manufacturer hereby rejects any liability whatsoever for damage or injury resulting from unauthorised modifications or conversions or from using spare parts from other manufacturers.</li> <li>• The use of parts which were not supplied by the manufacturer or its representatives will automatically cause the warranty to become void.<br/><b>USE GENUINE SPARE PARTS ONLY!</b></li> </ul>  |
| Qualified personnel                               | <p>The following persons shall be considered as qualified personnel:</p> <ul style="list-style-type: none"> <li>• Persons who underwent special professional training in the field of medical engineering,</li> <li>• persons who can assess their work and recognize the potential hazards involved on the basis of their professional experience and instruction in safety-relevant regulations.</li> <li>• In States where the performance of tasks in the medical engineering sector is subject to certification, qualified personnel must have obtained the corresponding certificate.</li> </ul>  |

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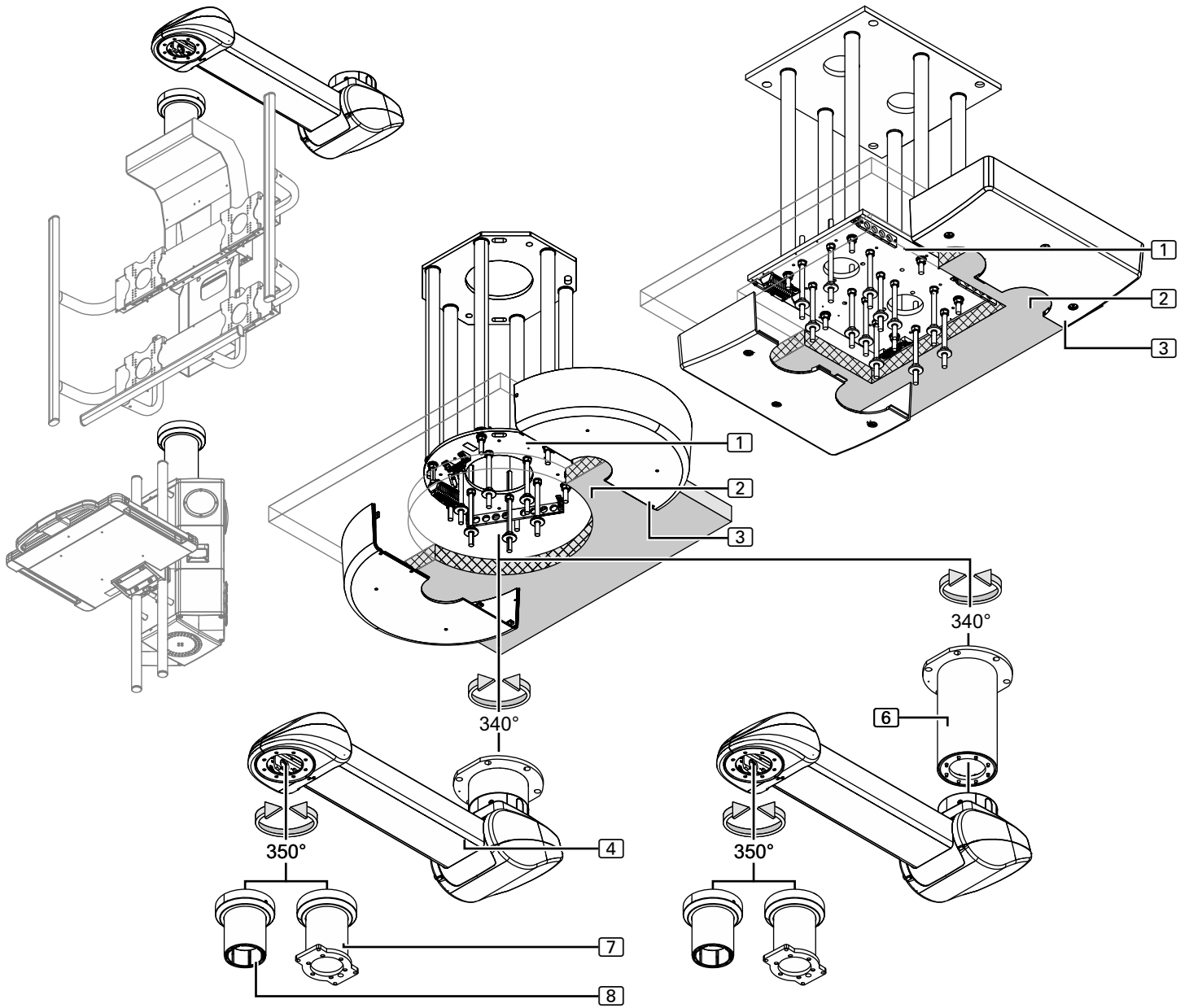
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Figure 1: Scope of delivery of the spring arm, Navigator Lift™ 180 Single arm

1.1 Overview of the pendant system



See "Figure 1: on page 8"

- ① Interface plate (Single / Duo) – pre-assembled
- ② Intermediate ceiling – installed by the customer on site

## 1.2 Scope of delivery of the spring arm, Navigator Lift™ 180 Single arm

The scope of delivery can vary depending on the individual order.

Canopy fixing elements

- ③ Canopy (Single / Duo) (Flat / High) (depending on the version)  
Installation as described in Chapter 14 on page 78
  - 1 Single canopy Ø 600mm x 150mm, 1 canopy attachment 110mm high
  - 1 Single canopy – 700mm x 700mm x 150mm high
  - 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm
  - 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 150mm
  - 1 canopy attachment – 700mm x 700mm x 120mm high
  - 4 / 6 threaded bolts M10 x 360mm, 4 / 6 hexagonal nuts M10,
  - 4 / 6 metal screws, 4 / 6 cover screws and 1 sectional strip

Pre-assembled components

- ④ Spring arm with ceiling tube (pre-assembled)  
Installation as described in Chapter 8 on page 39
  - 1 spring arm
  - 1 power supply cable
  - Supply cable for electromagnetic brake
  - 1 signal cable for electromagnetic brake (in protective tube)
  - 2 earthing cables 4mm<sup>2</sup>
  - 1 setscrew M16 – DIN EN ISO 4028,
  - 2 ball stops Ø 12.7mm
  - 2 side panels, front right / left joint for spring arm
  - 1 cover, front joint for spring arm
  - 2 cover straps, front joint for spring arm
  - 2 side panels, rear right / left joint for spring arm
  - 1 cover, rear joint for spring arm
  - 2 cover straps, rear joint for spring arm
  - 12 hexagonal nuts M16 and 6 spring rings, 12 flat washers external Ø 34mm and 12 plastic insulating discs, 6 threaded bolts M16 x 330mm

Pre-assembled or loose components  
incl. in the scope of delivery  
(see Chapter 15.6 on page 89)

Spring arm fixing elements

- ⑥ Extended spring arm ceiling tube  
Pre-installation as described in Chapter 7 on page 35
  - 1 ceiling tube (length as specified in the order)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 1 socket wrench extension (for 500 and 700mm ceiling tube length only)
  - 8 Allen cylinder screws M10 x 25mm – 8.8 – DIN EN ISO 4762
  - 8 lock washers S10

Loose components incl.  
in the scope of delivery  
Fixing elements for  
additional ceiling tube

Pre-assembled components  
Drop tube fixing elements  
Drop tube fixing elements  
mounted to the Navigator M6

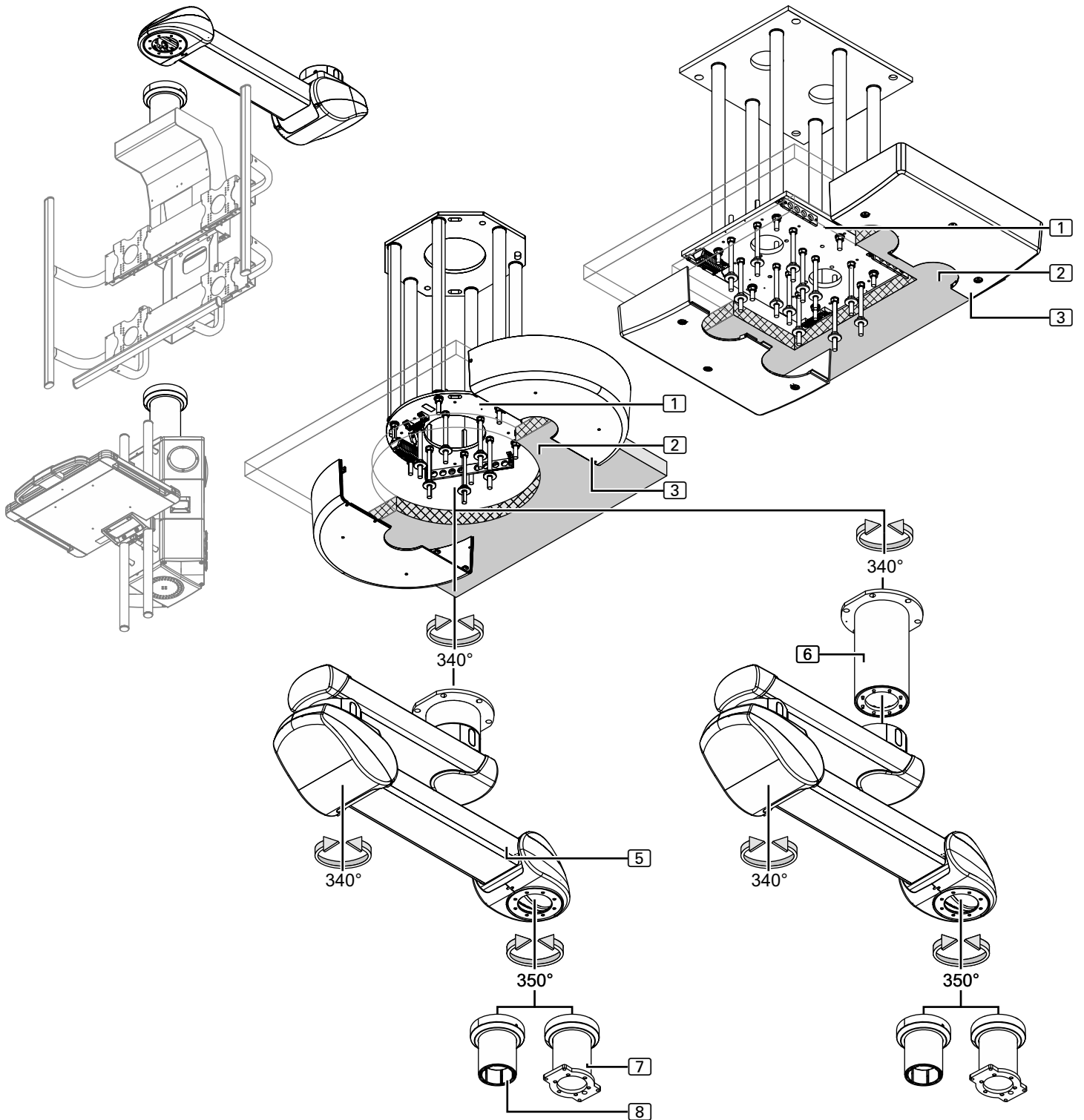
- ⑦ Drop tube for Navigator M6  
Installation as described in Chapter 9 on page 45
  - 1 Drop tube (in order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642
  - included in the scope of delivery of the Navigator M6

Pre-assembled components  
Drop tube fixing elements  
Fixing elements  
Drop tube on the CEMOR

- ⑧ Drop tube for CEMOR  
Installation as described in Chapter 9 on page 45
  - 1 Drop tube (in order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642
  - 6 Allen cylinder screws M8 x 35mm – 8.8 – DIN EN ISO 4762
  - 6 lock washers S8

Figure 2: Scope of delivery of the extension arm with spring arm, Navigator Lift™ 180 Dual arm

### 1.3 Overview of the pendant system



See "Figure 2: on page 10"

- ① Interface plate (Single / Duo) – pre-assembled
- ② Intermediate ceiling – installed by the customer on site

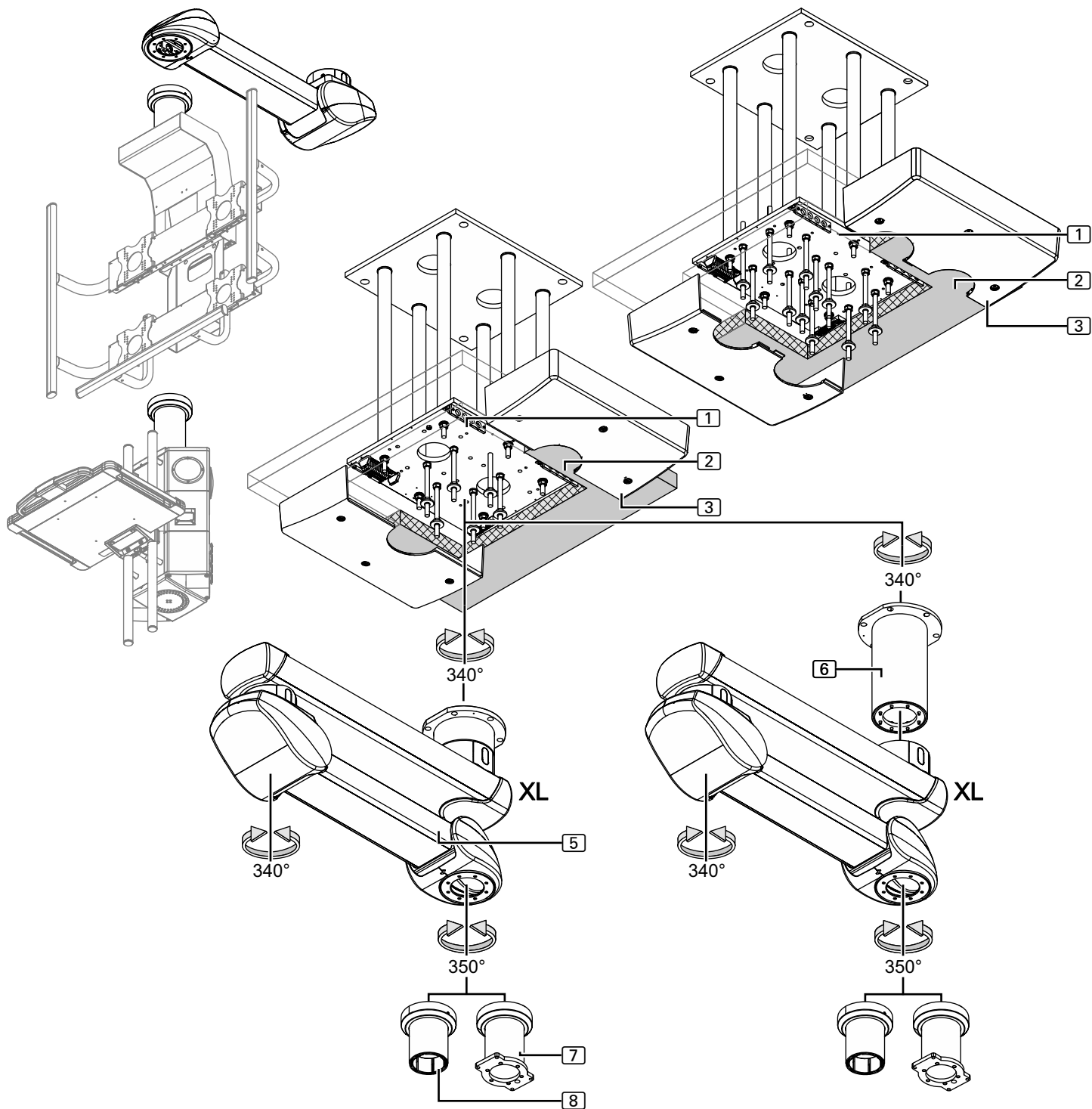
#### 1.4 Scope of delivery of the extension arm with spring arm, Navigator Lift™ 180 Dual arm

The scope of delivery can vary depending on the individual order.

Canopy fixing elements	<ul style="list-style-type: none"> <li>③ Canopy (Single / Duo) (Flat / High) (depending on the version) Installation as described in Chapter 14 on page 78               <ul style="list-style-type: none"> <li>– 1 Single canopy Ø 600mm x 150mm, 1 canopy attachment 110mm high</li> <li>– 1 Single canopy – 700mm x 700mm x 150mm high</li> <li>– 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm</li> <li>– 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 150mm</li> <li>– 1 canopy attachment – 700mm x 700mm x 120mm high</li> <li>– 4 / 6 threaded bolts M10 x 360mm, 4 / 6 hexagonal nuts M10,</li> <li>– 4 / 6 metal screws, 4 / 6 cover screws and 1 sectional strip</li> </ul> </li> </ul>
Pre-assembled components	<ul style="list-style-type: none"> <li>⑤ Extension arm with spring arm and ceiling tube (pre-assembled) Installation as described in Chapter 8 on page 39               <ul style="list-style-type: none"> <li>– 1 extension arm 600, 800, 1000, 1200mm long</li> <li>– 1 power supply cable</li> <li>– Supply cables for electromagnetic brakes</li> <li>– 1 signal cable for electromagnetic brakes (in protective tube)</li> <li>– 3 earthing cables 4mm<sup>2</sup> (2 earthing cables for unassembled ceiling tube)</li> <li>– 2 setscrews M16 – DIN EN ISO 4028, 4 ball stops Ø 12.7mm</li> <li>– 2 section end caps for extension arm</li> <li>– 2 side panels, front right / left joint for spring arm</li> <li>– 1 cover, front joint for spring arm</li> <li>– 2 cover straps, front joint for spring arm</li> <li>– 2 side panels, rear right / left joint for spring arm</li> <li>– 1 cover, rear joint for spring arm</li> <li>– 2 cover straps, rear joint for spring arm</li> <li>– 12 hexagonal nuts M16 and 6 spring rings, 12 flat washers external Ø 34mm and 12 plastic insulating discs, 6 threaded bolts M16 x 330mm</li> </ul> </li> </ul>
Pre-assembled or loose components incl. in the scope of delivery (see Chapter 15.6 on page 89)	<ul style="list-style-type: none"> <li>⑥ Extended ceiling tube Pre-installation as described in Chapter 7 on page 35               <ul style="list-style-type: none"> <li>– 1 ceiling tube (length as specified in the order)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 1 socket wrench extension (for 500 and 700mm ceiling tube length only)</li> <li>– 8 Allen cylinder screws M10 x 25mm – 8.8 – DIN EN ISO 4762</li> <li>– 8 lock washers S10</li> </ul> </li> </ul>
Loose components incl. in the scope of delivery Fixing elements for additional ceiling tube	<ul style="list-style-type: none"> <li>⑦ Drop tube for Navigator M6 Installation as described in Chapter 9 on page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (in order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642</li> <li>– included in the scope of delivery of the Navigator M6</li> </ul> </li> </ul>
Pre-assembled components Drop tube fixing elements Drop tube fixing elements mounted to the Navigator M6	<ul style="list-style-type: none"> <li>⑧ Drop tube for CEMOR Installation as described in Chapter 9 on page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (in order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642</li> <li>– 6 Allen cylinder screws M8 x 35mm – 8.8 – DIN EN ISO 4762</li> <li>– 6 lock washers S8</li> </ul> </li> </ul>
Pre-assembled components Drop tube fixing elements Fixing elements Drop tube on the CEMOR	

Figure 3: Scope of delivery of the XL extension arm with spring arm, Navigator Lift™ XL 180 Dual arm

1.5 Overview of the pendant system



See "Figure 3: on page 12"

- ① Interface plate (Single / Duo) – pre-assembled
- ② Intermediate ceiling – installed by the customer on site

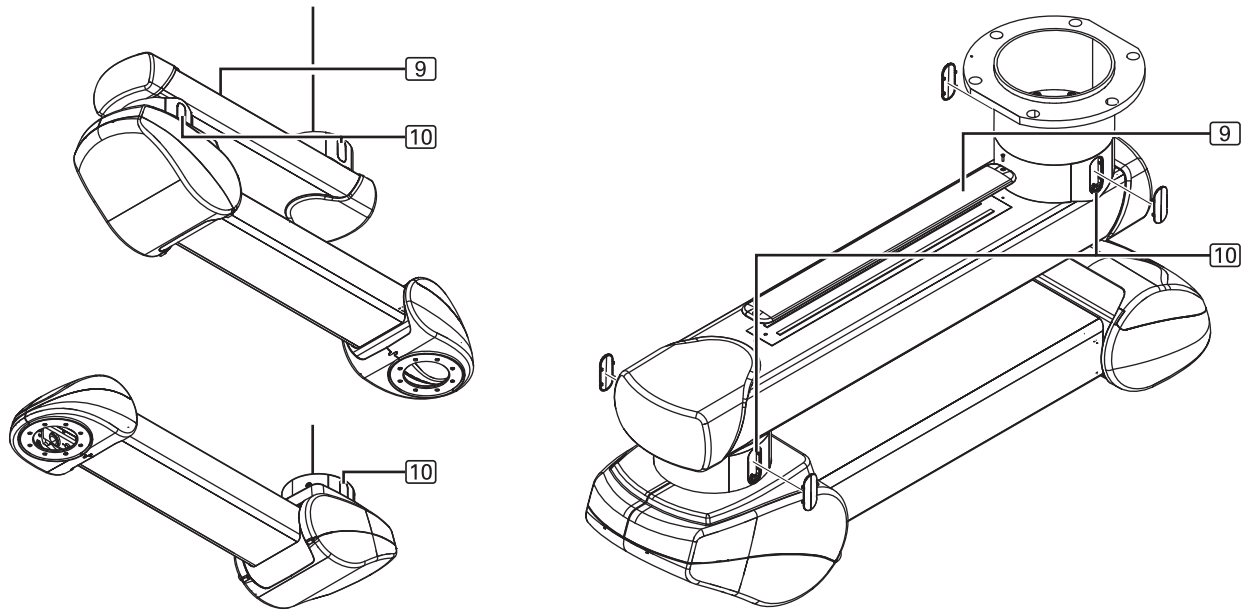
## 1.6 Scope of delivery of the XL extension arm with spring arm, Navigator Lift™ XL 180 Dual arm

The scope of delivery can vary depending on the individual order.

Canopy fixing elements	<ul style="list-style-type: none"> <li>③ Canopy (Single / Duo) (Flat / High) (depending on the version) Installation as described in Chapter 14 on page 78               <ul style="list-style-type: none"> <li>– 1 Single canopy – 700mm x 700mm x 150mm high</li> <li>– 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm</li> <li>– 1 Duo canopy (installation with intermediate ceiling) – 700mm x 700mm x 150mm</li> <li>– 1 canopy attachment – 700mm x 700mm x 120mm high</li> <li>– 4 / 6 threaded bolts M10 x 360mm, 4 / 6 hexagonal nuts M10,</li> <li>– 4 / 6 metal screws, 4 / 6 cover screws and 1 sectional strip</li> </ul> </li> </ul>
Pre-assembled components	<ul style="list-style-type: none"> <li>⑤ XL extension arm with spring arm and ceiling tube (pre-assembled) Installation as described in Chapter 8 on page 39               <ul style="list-style-type: none"> <li>– 1 XL extension arm, 600, 800, 1000, 1200, 1400, or 1600mm long</li> <li>– 1 power supply cable</li> <li>– Supply cables for electromagnetic brakes</li> <li>– 1 signal cable for electromagnetic brakes (in protective tube)</li> <li>– 3 earthing cables 4 mm<sup>2</sup> (2 earthing cables for unassembled ceiling tube)</li> <li>– 1 setscrew M20 – DIN EN ISO 4028, 2 ball stops Ø 16mm</li> <li>– 1 setscrew M16 – DIN EN ISO 4028, 2 ball stops Ø 12.7mm</li> <li>– 2 section end caps for XL extension arm</li> <li>– 2 side panels, front right / left joint for spring arm</li> <li>– 1 cover, front joint for spring arm</li> <li>– 2 cover straps, front joint for spring arm</li> <li>– 2 side panels, rear right / left joint for spring arm</li> <li>– 1 cover, rear joint for spring arm</li> <li>– 2 cover straps, rear joint for spring arm</li> <li>– 12 hexagonal nuts M16 and 6 spring rings, 12 flat washers external Ø 34mm and 12 plastic insulating discs, 6 threaded bolts M16 x 330mm</li> </ul> </li> </ul>
Pre-assembled or loose components incl. in the scope of delivery (see Chapter 15.6 on page 89)	<ul style="list-style-type: none"> <li>⑥ Extended ceiling tube Pre-installation as described in Chapter 7 on page 35               <ul style="list-style-type: none"> <li>– 1 ceiling tube (length as specified in the order)</li> <li>– 1 earthing cable, 4 mm<sup>2</sup></li> <li>– 1 socket wrench extension (for 500 and 700mm ceiling tube length only)</li> <li>– 10 Allen cylinder screws M10 x 30mm – 8.8 – DIN EN ISO 4762</li> <li>– 10 lock washers S10</li> </ul> </li> </ul>
Loose components incl. in the scope of delivery Fixing elements for additional ceiling tube	<ul style="list-style-type: none"> <li>⑦ Drop tube for Navigator M6 Installation as described in Chapter 9 on page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (in order-specific length)</li> <li>– 1 earthing cable, 4 mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642</li> <li>– included in the scope of delivery of the Navigator M6</li> </ul> </li> </ul>
Pre-assembled components Drop tube fixing elements Drop tube fixing elements mounted to the Navigator M6	<ul style="list-style-type: none"> <li>⑧ Drop tube for CEMOR Installation as described in Chapter 9 on page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (in order-specific length)</li> <li>– 1 earthing cable, 4 mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 20mm – 10.9 – DIN EN ISO 10642</li> <li>– 6 Allen cylinder screws M8 x 35mm – 8.8 – DIN EN ISO 4762</li> <li>– 6 lock washers S8</li> </ul> </li> </ul>
Pre-assembled components Drop tube fixing elements Fixing elements Drop tube on the CEMOR	

Figure 4: Scope of delivery of optional accessories

### 1.7 Overview of optional accessories



See "Figure 4: on page 14"

Upon delivery of the system from the factory the following options are already assembled:

## 1.8 Scope of delivery of optional accessories

- 9 Indirect extension arm lighting (extension arm lengths 1000, 1200, 1400, or 1600 mm)

For a retrofit: Installation as described in Chapter 10.1 on page 47

- 1 extension arm lighting (600mm long, input voltage 12V DC)
- 3 sealing plugs on the top side of the extension arm
- 1 basic carrier with LED and connecting cable
- 1 electric signal cable, with connectors on both ends
- 1 cover
- 2 countersunk screws M4 x 16mm – DIN EN ISO 10642

Pre-assembled components

Extension arm lighting fixing elements

- 10 Brake indicators (for Single arm version and Dual arm version)

For a retrofit: Installation as described in Chapter 10.2 on page 48

- 2 / 4 plastic covers (pre-assembled)
- 2 / 4 lighting boards (supply voltage 12V DC, 2 lighting boards each connected in series to 24V DC)
- 2 / 4 power cables

Pre-assembled components

## 1.9 Further optional accessories

- 1 telescopic magnet pick-up tool set

Observe the Installation Instructions  
for combined products

 **DANGER**

 **WARNING**

 **CAUTION**

*NOTICE*

NOTE

## 2.1 Approved Nuvo Products

The following Nuvo products are approved for use on the pendant system:

- Nuvo products in accordance with Chapter, "", on page 107

## 2.2 Combination with products of other manufacturers

- The pendant system is combined with the Navigator M6 or the monitor carrier system CEMOR. To prevent dangerous overload, which can lead to a failure or collapse of the pendant system, the maximum load bearing capacity specified in Chapter18, "Technical Data", on page 100 must be adhered to.
  - The party placing the appliance into operation is responsible for the validation of the overall system. A conformity assessment procedure shall be executed if required and a declaration in accordance with Article 12 of 93/42/EEC (Medical Device Directive, MDD) shall be provided.
  - For more detailed information on the installation of the Navigator M6 and the CEMOR, refer to the Installation Instructions of the CEMOR (Part 3: Installing the monitor carrier system CEMOR) or the Navigator M6 (Part 3: Installing the Navigator M6).
- Power packs intended for the supply of end devices must ensure electrical isolation and provide two protective measures in accordance with IEC 60601-1.

## 2.3 Structure of the safety instructions

### 2.3.1 Warnings of risk of injury

Important notes in this document are marked with graphic symbols and signal words. Signal words such as DANGER, WARNING or CAUTION describe the degree of risk of injury. The triangle symbols visually emphasise the degree of hazard.

DANGER refers to a potential hazard with a high degree of risk which, if not avoided, will lead to death or severe injury.

WARNING refers to a potential hazard with a medium degree of risk which, if not avoided, can lead to death or severe injury.

CAUTION refers to a potential hazard with a low degree of risk which, if not avoided, can lead to minor or moderate injury.

### 2.3.2 Warnings of damage to property

NOTICE refers to a potential hazard, which, if not avoided, will lead to damage to property.

### 2.3.3 Indication of additional information

A NOTE provides additional information and useful tips for the safe and efficient use of the appliance.

## 2.4 Supplementary symbols used in the safety instructions



Explosion hazard: warns of the improper use of oxygen (see Chapter 2.11, "Proper use of oxygen", on page 22).



Danger of fire: warns of the improper use of oxygen (see Chapter 2.11, "Proper use of oxygen", on page 22).



Electric shock hazard: warns of electric shock which can lead to severe injury or even death.




Pendant system dropping: warns of the risk of the pendant system suddenly dropping due to incorrect installation.



Sudden release of the spring arm: warns that the spring arm may jump up suddenly whilst dismantling the end device (e.g. flat screen, medical device, etc.) from the CEMOR or from the Navigator M6.



Tightening torque: warns of the pendant system suddenly dropping because the fixing screws have not been sufficiently tightened or not tightened at all.

<b>⚠️ WARNUNG</b> Personenschäden: Endgerät oder Adaption nicht abnehmen, bevor der Federarm in der Horizontalen (0 Grad Position) eingestellt und fixiert ist.	
<b>⚠️ WARNING</b> Personal injury: Do not remove the end device or adaption before the spring arm has been properly adjusted and fixed in its horizontal (0 degree) position.	
<b>⚠️ AVERTISSEMENT</b> Dommage corporel : Ne pas enlever l'équipement terminal ou le mécanisme adaptateur avant que le bras à ressort ne soit ajusté et fixé dans la position horizontale (0 degrés).	

## 2.5 Description of graphic symbols possibly used on the appliance and the package

WARNING SIGN: warns that the spring arm may jump up suddenly.

Personenschäden: Endgerät oder Adaption nicht abnehmen, bevor der Federarm in der Horizontalen (0 Grad Position) eingestellt und fixiert ist.

Personal injury: Do not remove the end device or adaption before the spring arm has been properly adjusted and fixed in its horizontal (0 degree) position.

Dommage corporel : Ne pas enlever l'équipement terminal ou le mécanisme adaptateur avant que le bras à ressort ne soit ajusté et fixé dans la position horizontale (0 degrés).

Read the Installation Instructions: Read these Installation Instructions carefully prior to installation of the pendant system. This ensures that you benefit from all the advantages of the pendant system and prevents any risk of injury or damage.

Observe the maximum load bearing capacity or maximum loading capacity (payload): warns of the risk of the appliance suddenly dropping because the maximum load bearing capacity or maximum loading capacity (payload) has been exceeded. The maximum value is indicated in kg or Nm.

General note reminding the user to handle the pendant system with care.

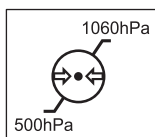
Environmentally friendly disposal: warns of damage to the environment caused by improper disposal of the pendant system (must not be disposed of as normal household waste).

CE mark: Nuvo declares that the products comply with the relevant regulations set forth in the applicable European Directives.

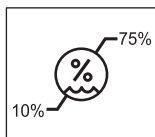
CE mark with the ID number of the indicated conformity assessment body: Nuvo declares that the assessment of conformity in accordance with 93/42 EEC (Medical Device Directive) has been performed by the indicated body.

This symbol marks the product as a component approved by a "Nationally Recognized Testing Laboratory" which complies with both Canadian and US deviations from applicable standards.

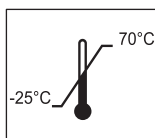




Atmospheric pressure: indicates the permissible atmospheric pressure values in a range from 500hPa to 1060hPa for transport and storage.



Relative humidity: indicates the permissible humidity values in a range from 10% to 75% for transport and storage.



Ambient temperature: indicates the permissible ambient temperature values in a range from -25°C to 70°C for transport and storage.

These Installation Instructions apply to this model

## 2.6 Intended purpose

- Pendant systems Navigator Lift™ 180 Single, Navigator Lift™ 180 Dual, Navigator Lift™ XL 180 Dual
- The pendant system is individually equipped; depending on the version and equipment, it serves for:
  - carrying and positioning medical devices in OR or intensive care rooms and medical environments.
  - The conveying and extraction of fluids:
    - medical gases, vacuum and compressed air (only Navigator M6),
    - electricity and data.
- The pendant system is suitable for continuous operation.

### 2.6.1 Incorrect use

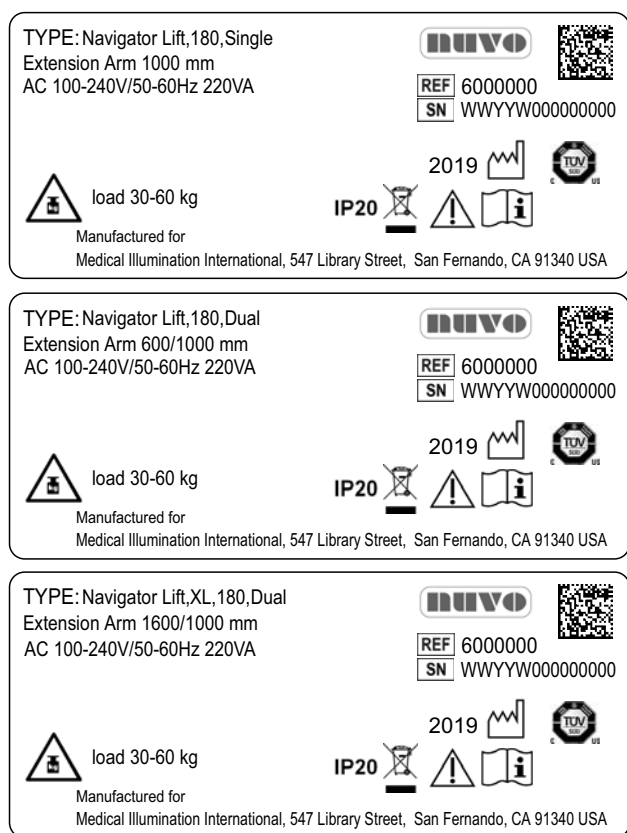
- The maximum load bearing capacity of the pendant system and its components as specified in Chapter 18, “Technical Data”, on page 100 must not be exceeded.
- The maximum duty cycle of the electromagnetic brakes of the pendant system must not exceed 1 minute.
  - If the electromagnetic brakes are actuated over a longer period of time, the power pack can switch off automatically as a protection measure against overheating.
  - Once the power pack has switched off, it must cool down for 10 minutes and then be disconnected from the mains for 10 seconds before being switched back on again. Normal system operation can only be resumed afterwards. To prevent safety cutoffs, the maximum duty cycle should not be exceeded.

### 2.6.2 Contraindications

- The pendant system must not be used close to strong magnetic fields.
- No BF or CF application parts in accordance with IEC 60601-1 may be directly connected to the pendant system.

Duty cycle of the electromagnetic brakes

Figure 5: Information on the rating plate



## 2.7 Ambient conditions

### 2.7.1 Ambient conditions for storage and transport

The following conditions apply to storage:

- Ambient temperature: -25 °C to 70 °C
  - Relative humidity: 10 % to 75 %
  - Atmospheric pressure: 500 hPa to 1,060 hPa
- Store only in indoor rooms.

### 2.7.2 Ambient conditions for operation

- Ambient temperature: 10 °C to 40 °C
  - Relative humidity: 30 % to 75 %
  - Atmospheric pressure: 700 hPa to 1,060 hPa
- This corresponds to a maximum operating altitude of 3,000m.

## 2.8 Information on the rating plate

(See "Figure 5")

- The rating plates are attached to the top side of the extension arm or XL extension arm and under the front cover of the spring arm.

#### Serial number

- The rating plate indicates the serial number (SN) of the pendant system.

#### Power supply

- The rating plate provides information on the power supply of the pendant system.

#### Load bearing capacity

- The value of e.g. 120 – 180kg indicates the permissible weight range and the maximum load bearing capacity of the spring arm.

#### Date of manufacture

- The digits 1 to 4 of the serial number (SN) indicate the date of manufacture of the pendant system.
- The first two digits indicate the week of manufacture, e.g. 14 = calendar week 14.
- The following two digits indicate the year of manufacture, e.g. 15 = 2015.
- The letter in the 5th position indicates the factory, e.g. H = Hünfeld.
- The digits following the letter indicate the serial number.
- The information and illustrations serve as examples.
- The information and illustrations on the rating plate can vary.

## 2.9 Retrofit to an already installed ceiling mount

### ⚠ WARNING



#### Risk of the ceiling mount dropping

In the case of retrofits to an already installed ceiling mount the fixing elements used must be inspected by a structural analyst and approved for the new pendant system:

- Retrofits are not permitted if this approval has not been granted

## 2.10 Overview of the most important safety instructions

The safety instructions in the following chapters must be adhered to.

### ⚠ WARNING



#### Electric shock hazard

To prevent the risk of electric shock, the pendant system may only be connected to a power supply network equipped with a protective conductor:

- The pendant system must be connected in such a way that it can be disconnected from the mains at all poles and at the same time.

### ⚠ WARNING



#### Risk of parts falling off

Make sure that no-one is standing underneath the components of the pendant system.

### ⚠ WARNING



#### Electric shock hazard

Contact with energised components presents a danger to life from electric shock. Motor-driven, mobile device components can cause injury in the case of being switched on unintentionally.

Prior to any installation and setting up work, the pendant system must be disconnected from the mains:

- Disconnect all poles of the power supply source from the mains and prevent it from being reconnected accidentally.
- Check whether the appliance is de-energised.
- Earth and short-circuit the appliance.
- Cover and shield any adjacent energised parts.

### ⚠ WARNING



#### Pendant system dropping

The tightening torques are marked in these Installation Instructions:

- Observe the tightening torques indicated in these Installation Instructions.



#### Risk of the pendant system dropping because the maximum load bearing capacity has been exceeded

If the maximum load bearing capacity has been exceeded, there is a risk that the pendant system or components of the pendant system may disengage from the fastening device and drop:

- The maximum loading capacity on the pendant system must not be exceeded!
- Do not attach or mount any additional loads to the extension arm, spring arm, adaptations (CEMOR or Navigator M6) and end devices.

**⚠ WARNING****Sudden release of the spring arm**

Warns of the spring arm suddenly jumping up whilst dismantling the end devices from the CEMOR or the Navigator M6 or whilst dismantling an adaption device, such as the Navigator M6 or the CEMOR from the spring arm:

- Before dismantling an end device (e.g. flat screen, medical device, etc.) from the CEMOR or the Navigator M6 or before dismantling the CEMOR or the Navigator M6 from the spring arm, adjust the height adjustment mechanism on the spring arm to the horizontal (0 degree position) and then fix it in this position.
- Check the height adjustment of the spring arm. Once the height adjustment mechanism has been fixed in the horizontal (0 degree position), it must no longer be possible to move the spring arm upwards.
- The end device (e.g. flat screen, medical device, etc.) may only be removed in the horizontal (0 degree position), if the spring arm can no longer be moved upwards.

**2.11 Proper use of oxygen****⚠ DANGER****Oxygen explosion**

Oxygen becomes explosive when in contact with oils, greases and lubricants. Compressed oxygen presents an explosion hazard:

- Make sure that the oxygen and gas outlet points are free from oily, greasy and lubricating materials!
- Do not use any cleaning agents containing oil, grease or lubricants.

**Danger of fire**

Escaping oxygen is combustible:

- Open fire, red hot objects and open light are not permitted when working with oxygen!
- Do not smoke!

## 2.12 Warranty

### ⚠ WARNING



#### Pendant system dropping

The pendant system, the CEMOR or the Navigator M6 are an adapted system with regard to the maximum load bearing capacity and maximum loading capacity (payload). Alterations to the pendant system can result in exceeding the permissible, total or maximum loading capacity of the individual components. In this case, there is a risk of the pendant system or components of the pendant system disengaging from the fastening device and dropping.

Nuvo warrants the functional reliability of the pendant system only under the condition that:

- no structural alterations are made to the pendant system. Unauthorised modifications or conversions to pendant system are not permitted for safety reasons.
- only genuine spare parts or accessories and those defined and approved by Nuvo are used. The use of other parts may involve unknown risks and must be avoided in all cases.
- inspections and maintenance are carried out at the specified time intervals.
- Related documents for dismantling, mounting and adjustment work to be carried out on the pendant system and approved accessories are available from Nuvo on request.
- The party placing the appliance into operation is responsible for the validation of the overall system. A conformity assessment procedure shall be executed if required, and a declaration in accordance with Article 12 of 93/42/EEC (Medical Device Directive, MDD) shall be provided.

## 2.13 Disposal

### ⚠ WARNING

#### Sudden release of spring tension

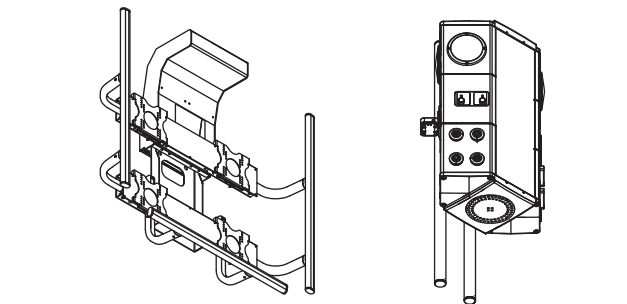
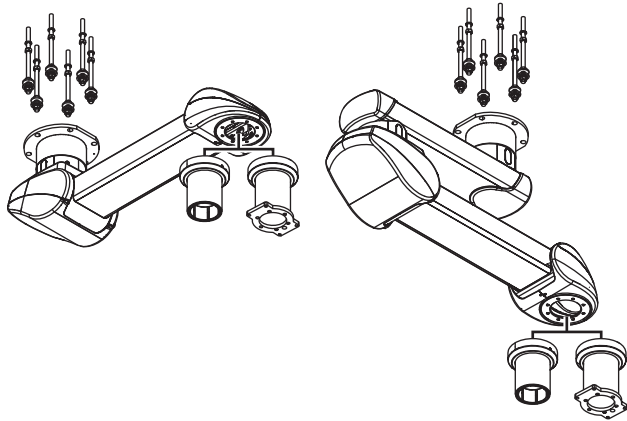
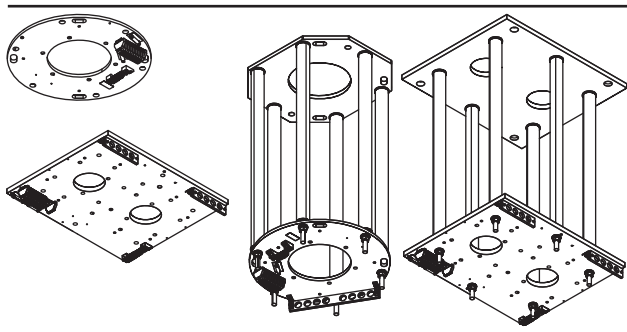
The spring arm is equipped with a compression spring. When dismantling the spring arm, the compression spring suddenly releases its tension and can lead to severe injury:

- Do not dismantle the spring arm for disposal.

RoHS conformity

- The pendant system complies with the requirements of the 2011/65/EC RoHS Directive (on the restricted use of certain hazardous substances in electrical and electronic equipment).
- To prevent environmental damage and personal injury, we request you to contact us or your authorised service partner if you intend to take the pendant system out of operation for the purpose of disposal.
- The pendant system must be disposed of at a suitable collection point for recyclable waste in accordance with country-specific regulations.

Figure 6: Overview of the structure of these Installation Instructions



The Installation Instructions for the entire pendant system consist of separate documents. For this reason, these Installation Instructions are only valid and complete if all the documents are available at the place of installation.

The following parts must be available:

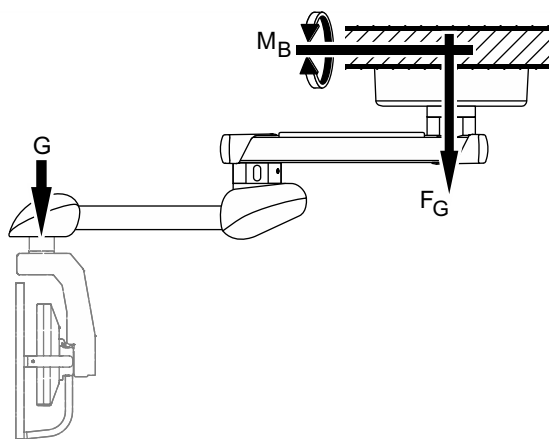
- Part 01: Ceiling mount
- Interface plate on the raw ceiling
- Intermediate ceiling set and interface plate

Part 02: Pendant system

Part 03: CEMOR or Navigator M6

- Lifting device or forklift with a permitted payload of at least 250kg Alternatively, a hoisting winch with an admissible payload of at least 250kg can be used if space is limited:
  - Check that the pendant system is sufficiently secured before lifting it.
  - When lifting the pendant system, make sure you avoid collisions with other pendant systems, devices, ceilings or walls and other assemblies.
- Protective gloves
- Digital spirit level
- Torque wrench
- Multimetre
- Standard tool kit
- 1 telescopic magnet pick-up tool set
- Working platform (e.g. pedestal ladder) in accordance with country-specific occupational health and safety regulations

Figure 7: Load data of the Single version



### 5.1 Load data of the Single version

(See "Figure 7")

The data required for calculating the ceiling load is indicated in the tables below. When mounting the pendant system to the Intermediate ceiling set, the vertical weight force of the Intermediate ceiling set (the values correspond to the maximum load) must be added to the corresponding values of the pendant system in order to determine the ceiling load. The table indicates the values for the maximum permissible load bearing capacity of the pendant system Single version. The load data of a Duo version can be added.

**! WARNING**



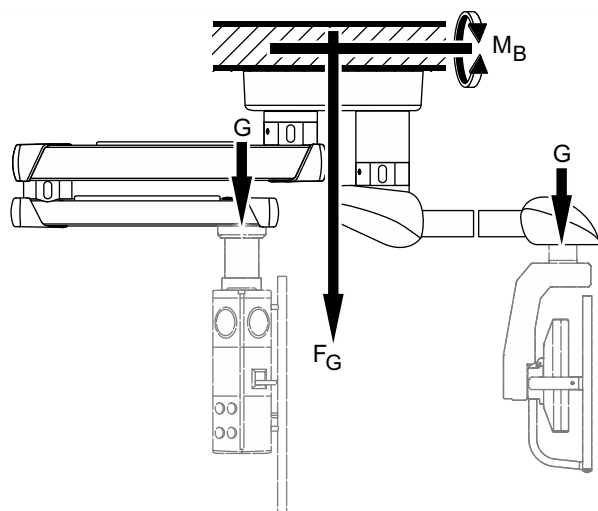
**Pendant system dropping**

The safety factors prescribed in the individual regions must be taken into account for calculating the maximum load data!

Table 01: Load Data of the Navigator Lift™ 180

Navigator Lift™ 180 Single; Single arm version	Vertical Weight force $F_G$ in N	Vertical weight force of the Intermediate ceiling set $F_G$ in N	Maximum bending Moment $M_B$ in Nm	Carrying loads G in kg
Spring arm 1015mm	2578	1300	1900	180
Navigator Lift™ 180 Dual; Dual arm version	Vertical Weight force $F_G$ in N	Vertical weight force of the Intermediate ceiling set $F_G$ in N	Maximum bending Moment $M_B$ in Nm	Carrying loads G in kg
Extension arm 600mm / spring arm 1015mm	2770	1300	3450	180
Extension arm 800mm / spring arm 1015mm	2701	1300	3800	170
Extension arm 1000mm / spring arm 1015mm	2535	1300	3900	150
Extension arm 1200mm / spring arm 1015mm	2368	1300	3950	130
Navigator Lift™ XL 180 Dual; Dual arm version with XL extension arm	Vertical Weight force $F_G$ in N	Vertical weight force of the Intermediate ceiling set $F_G$ in N	Maximum bending Moment $M_B$ in Nm	Carrying loads G in kg
XL extension arm 600mm / spring arm 1015mm	2948	1300	3450	180
XL extension arm 800mm / spring arm 1015mm	2997	1300	4000	180
XL extension arm 1000mm / spring arm 1015mm	3046	1300	4550	180
XL extension arm 1200mm / spring arm 1015mm	3095	1300	5100	180
XL extension arm 1400mm / spring arm 1015mm	3144	1300	5650	180
XL extension arm 1600mm / spring arm 1015mm	3193	1300	6250	180

Figure 8: Load data for support arm combinations



## 5.2 Load data for support arm combinations

(See "Figure 8")

The vertical weight forces and bending moments of the various pendant systems of Duo versions can be added.

Example

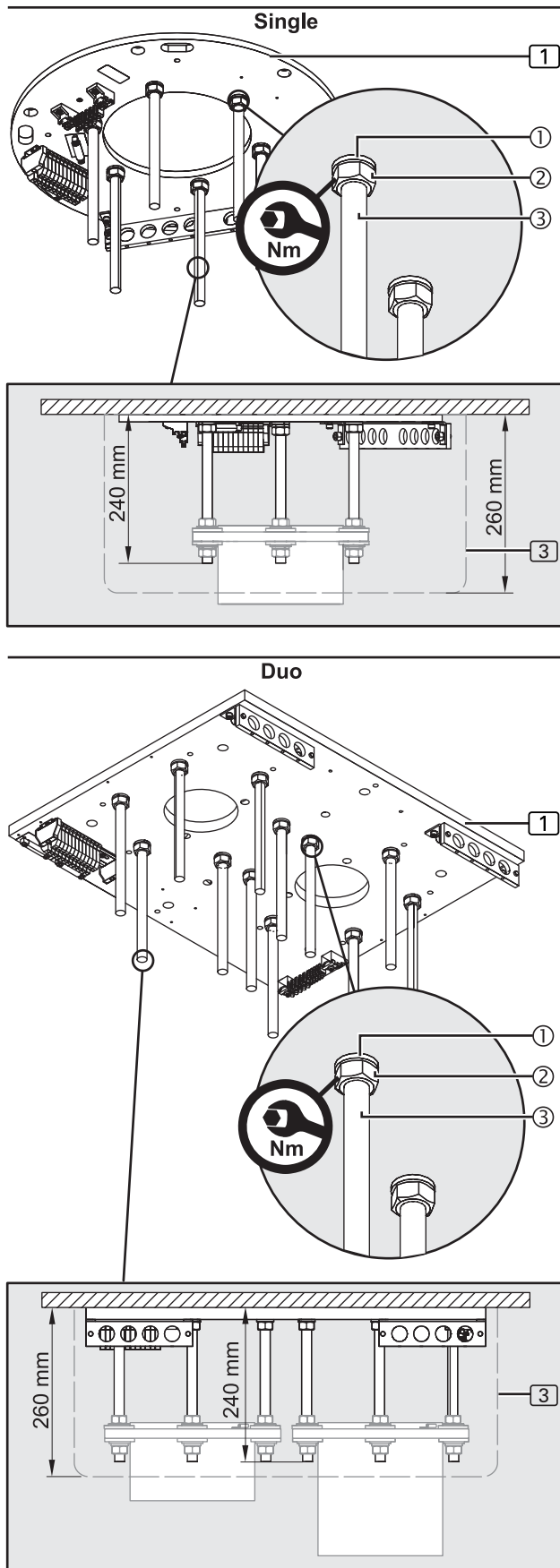
Navigator Lift™ 180 (spring arm 1015mm) on the Intermediate ceiling set combined with Navigator™ XL (extension arm 1200/1000mm).

Sum of weight forces:  $2578\text{N} + 3599\text{N} + 1300\text{N} = 8478\text{N}$ .

Sum of bending moments:  $1900\text{Nm} + 6502\text{Nm} = 8402\text{Nm}$ .

For the load data of the pendant system Navigator Lift™ combined with the pendant system, refer to the corresponding Installation Instructions.

Figure 9: Cutting and installing the threaded bolts for the Single / Duo interface plate on the raw ceiling



## 6.1 Mounting situation: Mounting the interface plate to the raw ceiling without intermediate ceiling

### 6.1.1 Versions

(See "Figure 9")

The following Figures illustrate the interface plate 1, Single (round shape), for installing the spring arm and spring arm with extension arm versions.

The installation steps required for the XL extension arm with spring arm version to the interface plate 1 Single (squared shape) are identical.

### 6.1.2 Cutting the threaded bolts to length

(See "Figure 9")

If a Single / Duo interface plate 1 is mounted to the raw ceiling, the 6 (Single version) or 12 (Duo version) threaded bolts M16 x 330mm 3 must be cut to length.

The Single / Duo canopy 3 with attachment to be mounted later is flush with the raw ceiling and covers the ceiling tube flange.

1. For canopy 3 which is 260 mm high the 6/12 threaded bolts M16 x 330mm 3 must be cut to 240 mm.
2. Slightly deburr the 6/12 threaded bolts M16 x 330mm 1 in order to ensure maximum thread engagement into the interface plate 1.

### 6.1.3 Mounting the threaded bolts

(See "Figure 9")

1. Screw 1 hexagonal nut M16 2 each onto the 6/12 threaded bolts M16 3 and then place 1 spring ring 1 each.

#### ! WARNING



#### Pendant system dropping

If the threaded bolts M16 3 are not completely screwed in, they may break out of the interface plate 1 and cause the pendant system to drop:

- Make sure that all shortened threaded bolts M16 3 are completely screwed into the interface plate 1 up to the end stop on the raw ceiling.



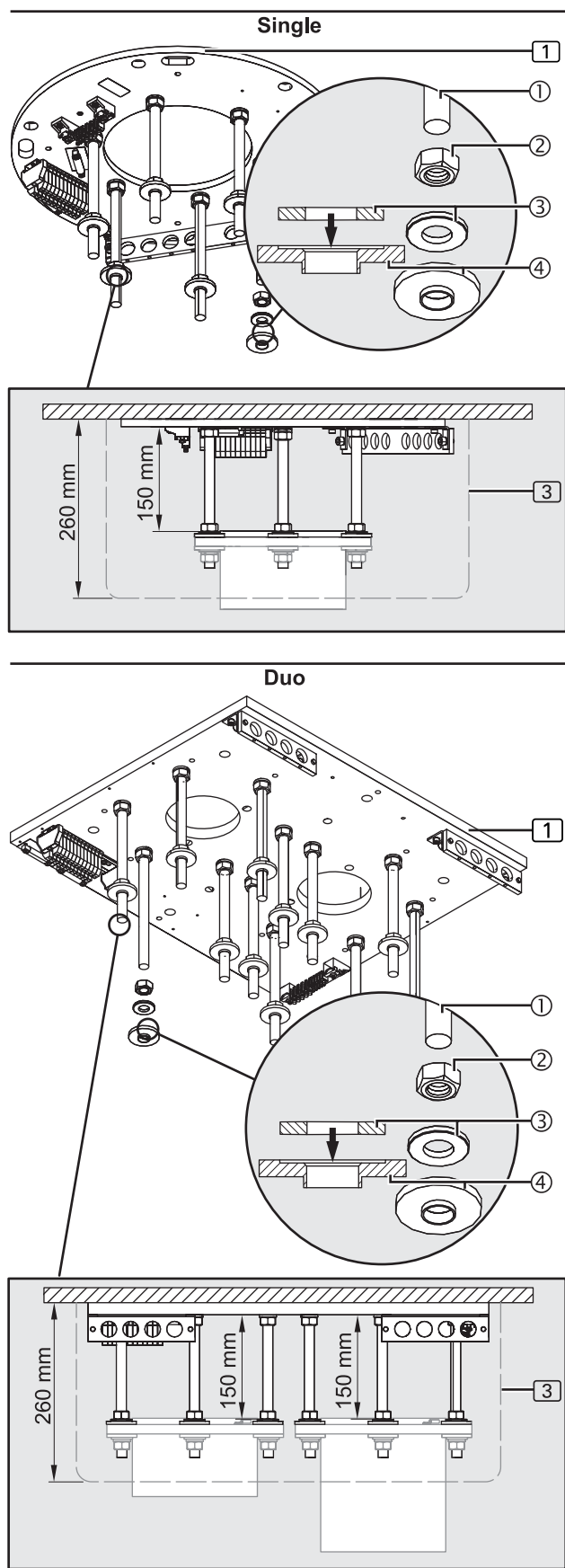
#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten all hexagonal nuts M16 2 with a tightening torque of 195Nm.

2. Check that the shortened threaded bolts M16 3 are securely in place at the correct distances to each other:
  - The threaded bolts M16 3 must be completely screwed into the interface plate 1.
  - The 6/12 hexagonal nuts M16 2 must be tightened to 195Nm.
3. Continue the installation as described in Chapter 6.1.4 on page 29.

Figure 10: Mounting the upper insulations to the threaded bolts



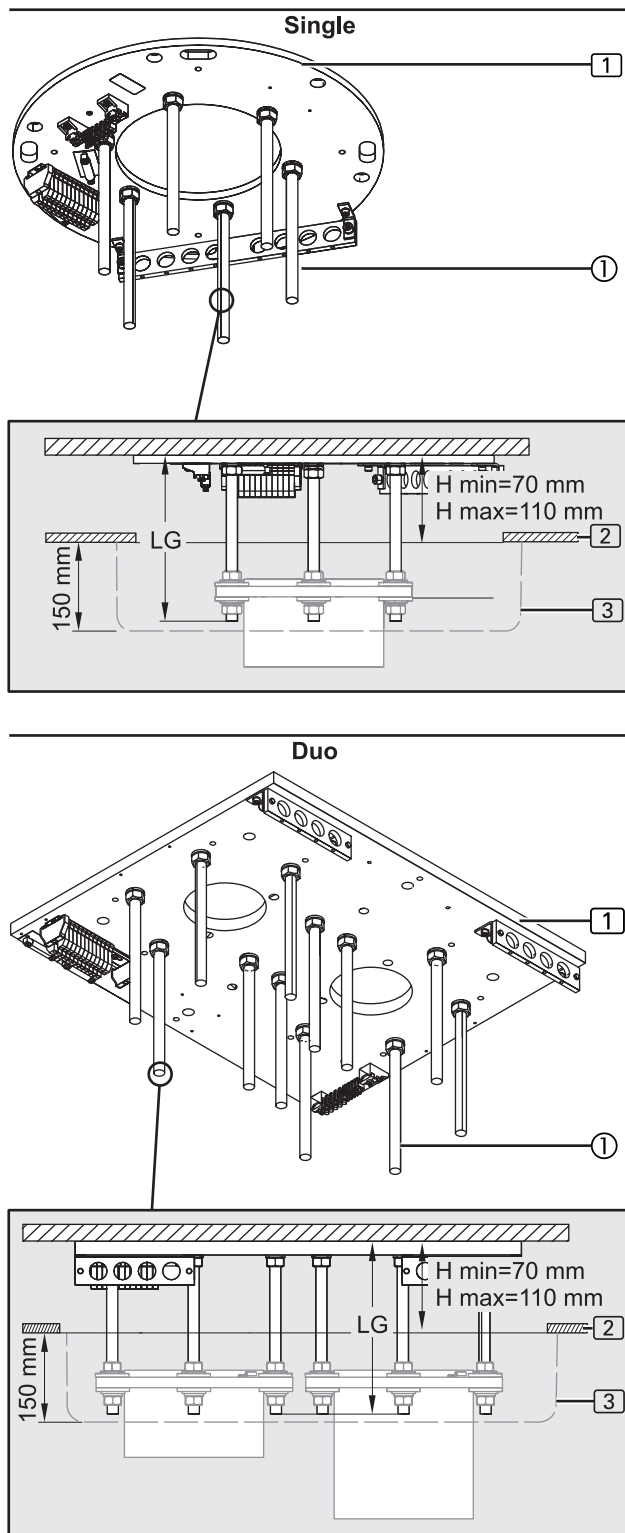
### 6.1.4 Mounting the upper insulations to the threaded bolts

(See "Figure 10")

The 6 (Single version) or 12 (Duo version) hexagonal nuts M16<sup>②</sup> must be mounted to the threaded bolts M16<sup>①</sup> at an exact distance to each other.

1. For each threaded bolt M16<sup>①</sup> screw a hexagonal nut M16<sup>②</sup> onto the threaded bolts M16<sup>①</sup>.
2. Adjust the distance between the hexagonal nuts M16<sup>②</sup> and the interface plate 1 to 150mm.
3. Using a digital spirit level, align the hexagonal nuts M16<sup>②</sup> in a horizontal position.
4. Place 1 flat washer with an external diameter of 34 mm<sup>③</sup>.
5. Place 1 plastic insulating disc<sup>④</sup> (as illustrated in the Figure) in such a way that the flat washer with an external diameter of 34 mm<sup>③</sup> (see arrow in the detailed representation in the Figure) sits in the plastic insulating disc<sup>④</sup>.
6. Using an adhesive or elastic tape, attach the plastic insulating disc<sup>④</sup> to the threaded bolts M16<sup>①</sup>.
7. Continue the installation as described in Chapter 7 on page 35 or Chapter 8 on page 39.

Figure 11: Cutting the threaded bolts for the Single / Duo interface plate on the raw ceiling to length



## 6.2 Mounting situation: Interface plate on the intermediate ceiling mount

### 6.2.1 Versions

(See "Figure 11")

The following Figures illustrate the interface plate (1), Single (round shape), for installing the spring arm and spring arm with extension arm versions.

The installation steps required for the XL extension arm with spring arm version to the interface plate (1) Single (squared shape) are identical.

### 6.2.2 Cutting the threaded bolts to length

(See "Figure 11")

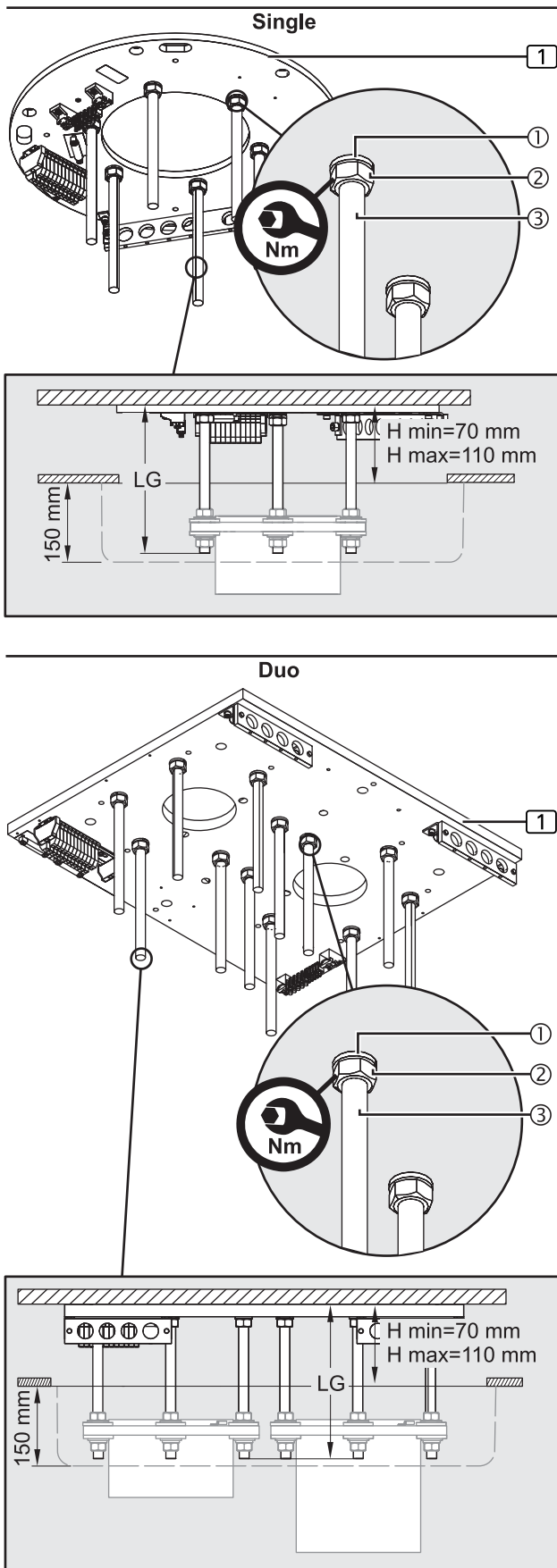
If a Single / Duo interface plate (1) is mounted to the raw ceiling with intermediate ceiling (2), the 6 (Single version) or 12 (Duo version) threaded bolts M16 x 330mm (1) must be cut to length.

The Single / Duo canopy (3) to be mounted later is flush with the intermediate ceiling (2) and covers the ceiling tube flange.

#### NOTE – Variable threaded bolt length

- The necessary length of the threaded bolts M16 x 330mm (1) depends on the distance H: from the raw ceiling to the bottom edge of the intermediate ceiling (2).
  - Observe the minimum and maximum length of the threaded bolts M16 x 330mm (1).
1. For a Single canopy (3), 150mm, Duo canopy (3), 150mm, cut the 6/12 threaded bolts M16 x 330mm (1) to length.
    - To determine the length LG of the threaded bolts (1):  $LG = H + 135\text{mm}$  (min. 205mm / max. 245mm)
    - Please contact Nuvo if you have any doubt.
  2. Slightly debur the 6/12 threaded bolts M16 x 330mm (1) in order to ensure maximum thread engagement into the interface plate (1).
  3. Continue the installation as described in Chapter 6.2.3 on page 31.

Figure 12: Mounting the upper insulations to the threaded bolts



### 6.2.3 Mounting the threaded bolts to the Single / Duo interface plate

(See "Figure 12")

1. Screw 1 hexagonal nut M16 ② each onto the 6/12 threaded bolts M16 ③ and then place 1 spring ring ① each.

#### ⚠ WARNING



##### Pendant system dropping

If the threaded bolts M16 ③ are not completely screwed in, they may break out of the interface plate ① and cause the pendant system to drop:

- Make sure that all shortened threaded bolts M16 ③ are completely screwed into the interface plate ① up to the end stop on the raw ceiling.



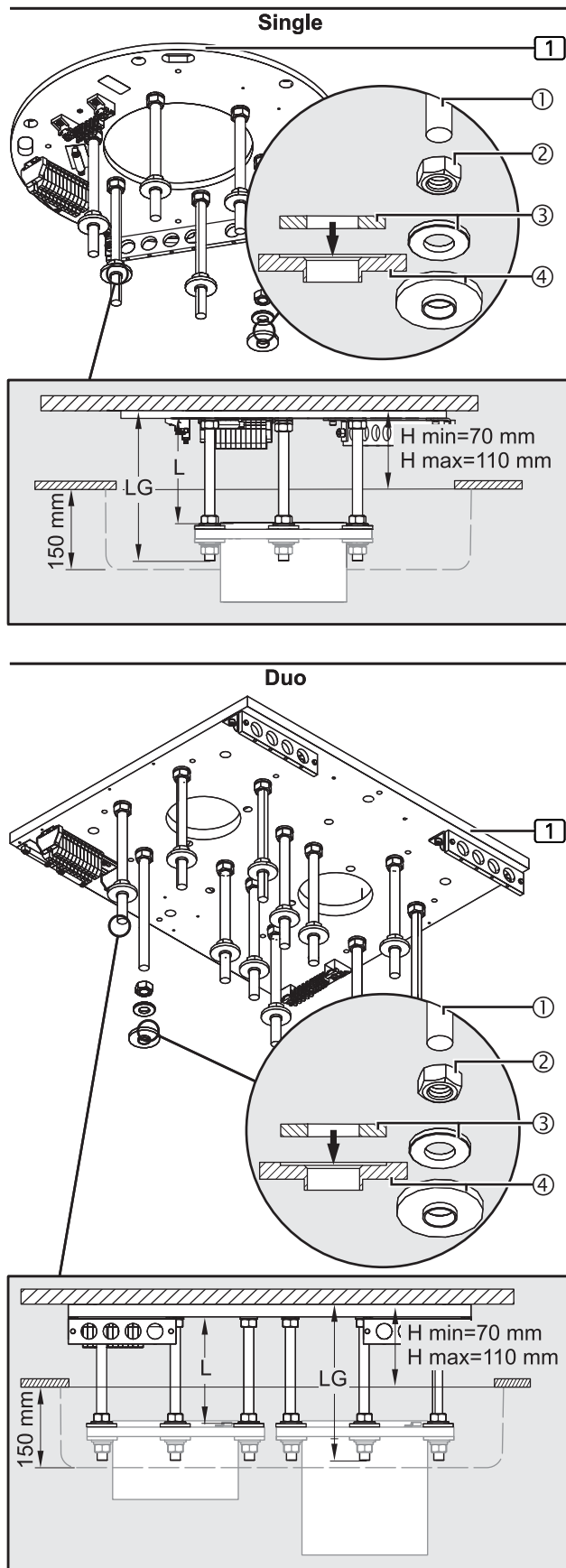
##### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten all hexagonal nuts M16 ② with a tightening torque of 195Nm.

2. Check that the shortened threaded bolts M16 ③ are securely in place at the correct distances to each other:
  - The shortened threaded bolts M16 ③ must be completely screwed into the interface plate ①.
  - The 6/12 hexagonal nuts M16 ② must be tightened to 195Nm.
3. Continue the installation as described in Chapter 6.2.4 on page 32.

Figure 13: Mounting the upper insulations to the threaded bolts

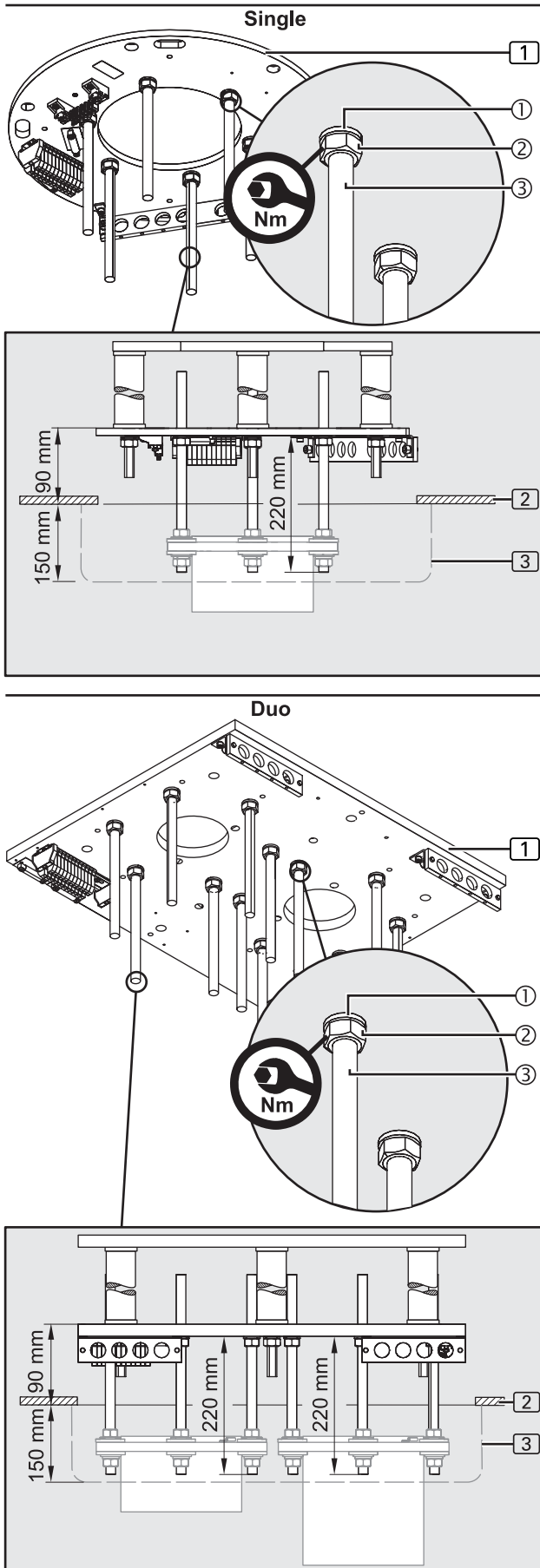


## 6.2.4 Mounting the upper insulations to the threaded bolts

(See "Figure 13")

1. For each threaded bolt M16① screw a hexagonal nut M16② onto the threaded bolts M16①.
2. Adjust the distance between the hexagonal nuts M16② and the interface plate ①:
  - $L = LG - 95\text{mm}$  (min.110mm / 150mm)
3. Screw the hexagonal nuts M16② onto the threaded bolts M16① at the calculated distance L.
4. Using a digital spirit level, align the hexagonal nuts M16② in a horizontal position.
5. Place 1 flat washer with an external diameter of 34 mm③.
6. Place 1 plastic insulating disc④ (as illustrated in the Figure) in such a way that the flat washer with an external diameter of 34 mm③ (see arrow in the detailed representation in the Figure) sits in the plastic insulating disc④.
7. Using an adhesive or elastic tape, attach the plastic insulating disc④ to the threaded bolts M16①.
8. Continue the installation as described in Chapter 7 on page 35 or Chapter 8 on page 39.

Figure 14: Mounting the threaded bolts



### 6.3 Mounting situation: Interface plate on the intermediate ceiling mount

#### 6.3.1 Versions

(See "Figure 14")

The following Figures illustrate the interface plate 1, Single (round shape), for installing the spring arm and spring arm with extension arm versions.

The installation steps required for the XL extension arm with spring arm version to the interface plate 1 Single (squared shape) are identical.

#### 6.3.2 Mounting the threaded bolts

(See "Figure 14")

The 6 (Single version) or 12 (Duo version) threaded bolts M16 x 330 mm 3 must protrude from the interface plate 1 at an exact distance. The Single / Duo canopy 3 to be mounted later is flush with the intermediate ceiling 2 and covers the ceiling tube flange.

#### ⚠ WARNING



#### Pendant system dropping

In order to ensure sufficient strength, the threaded bolts M16 1 must not exceed a maximum length of 330 mm.

1. Screw 1 hexagonal nut M16 2 each onto the 6/12 threaded bolts M16 x 330 mm 3 and then place 1 spring ring 1 each.
2. All threaded bolts M16 x 330 mm 3 must be completely screwed into the interface plate 1.  
The threaded bolts M16 x 330 mm 3 for the:
  - Single version = 220 mm
  - Duo version = 220 mm
 must protrude from the interface plate 1.

#### ⚠ WARNING



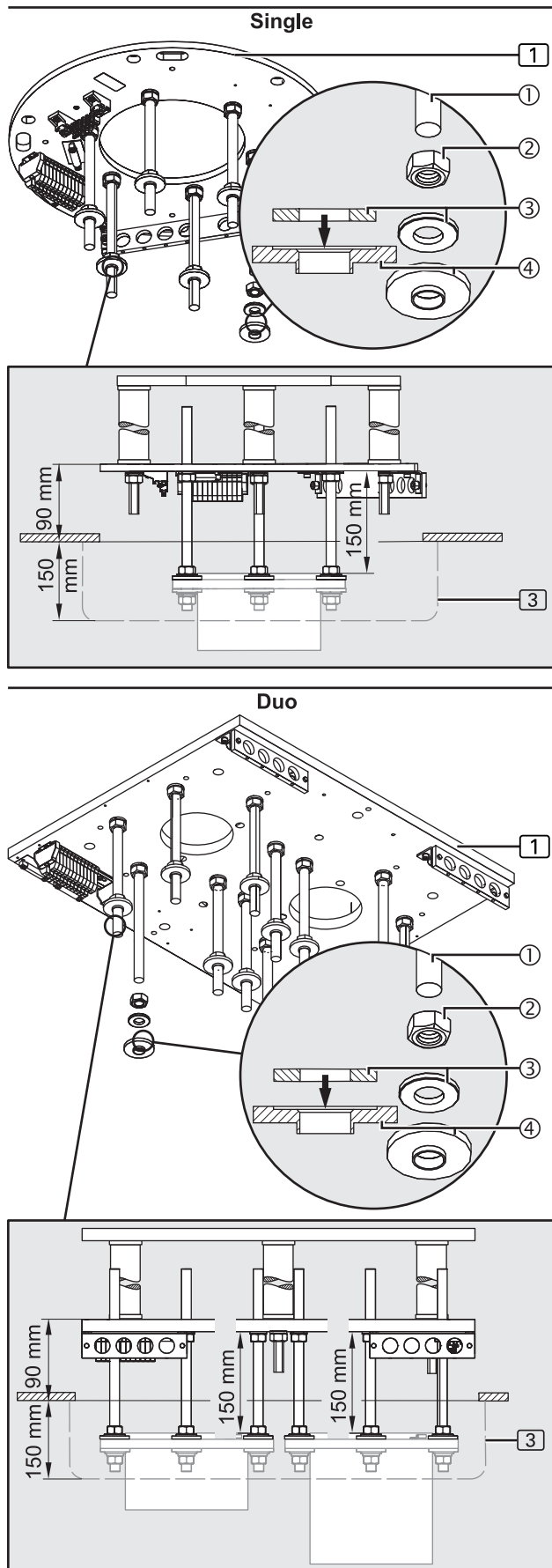
#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten all hexagonal nuts M16 2 with a tightening torque of 195 Nm.

3. Check that the threaded bolts M16 x 330 mm 3 are securely in place at the correct distances.
  - For the Single and Duo version 195 mm the threaded bolts M16 x 330 mm 3 must protrude from the interface plate 1.
  - The 6/12 hexagonal nuts M16 2 must be tightened to 195 Nm.
4. Continue the installation as described in Chapter 6.3.3 on page 34.

Figure 15: Mounting the upper insulations to the threaded bolts



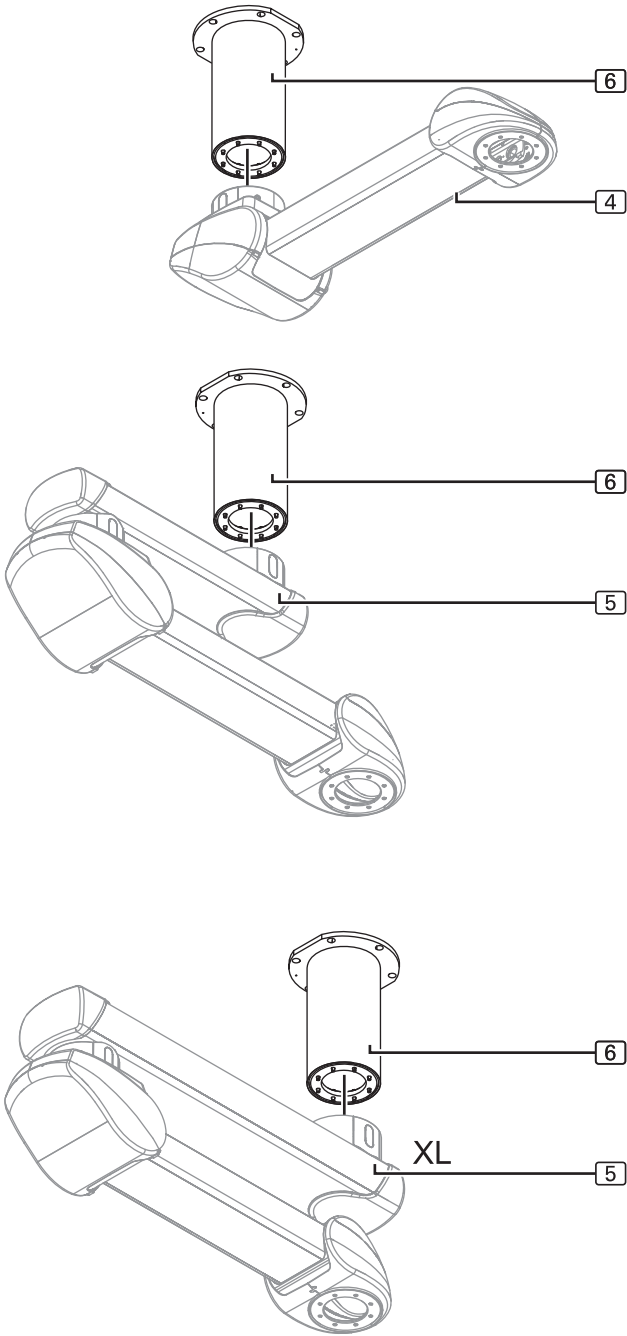
### 6.3.3 Mounting the upper insulations to the threaded bolts

(See "Figure 15")

The 6 (Single version) or 12 (Duo version) hexagonal nuts M16Ⓜ must be mounted to the threaded bolts M16 x 330mmⓂ at an exact distance to each other.

1. For each threaded bolt M16 x 330mmⓂ screw a hexagonal nut M16Ⓜ onto the threaded bolts M16 x 330mmⓂ .
2. Adjust the distance between the hexagonal nuts M16Ⓜ and the interface plate 1:
  - The distance between the hexagonal nuts M16Ⓜ and the interface plate 1 must be 150mm.
3. Using a digital spirit level, align the hexagonal nuts M16Ⓜ in a horizontal position.
4. Place 1 flat washer with an external diameter of 34mmⓂ.
5. Place 1 plastic insulating discⓂ (as illustrated in the Figure) in such a way that the flat washer with an external diameter of 34mmⓂ (see arrow in the detailed representation in the Figure) sits in the plastic insulating discⓂ .
  - Using an adhesive or elastic tape, attach the plastic insulating discⓂ to the threaded bolts M16Ⓜ.
6. Continue the installation as described in Chapter 7 on page 35 or Chapter 8 on page 39.

Figure 16: Components described in this chapter

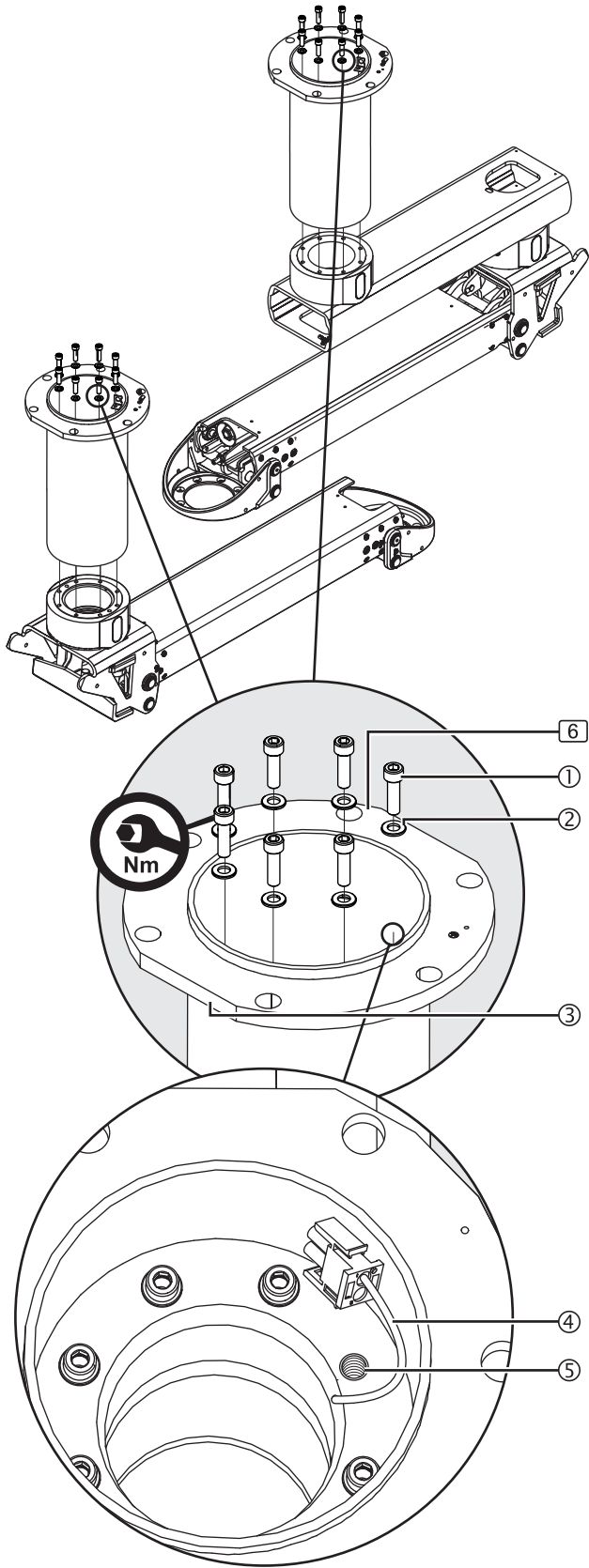


### 7.1 Components described in this chapter

(See "Figure 16")

- The ceiling tube [6] illustrated in the Figure is mounted to the spring arm [4] or extension arm with spring arm [5] or XL extension arm with spring arm [5].
- The Figure shows a simplified representation with only the spring arm [4] or the extension arm with spring arm [5] or XL extension arm with spring arm [5] without pre-assembled cables.
- The installation is described in the following chapters and varies for the different versions. Be aware of the different length and number of fixing screws for the different versions.

Figure 17: Mounting a ceiling tube



## 7.2 Mounting an extended ceiling tube

### 7.2.1 Mounting a ceiling tube

(See "Figure 17")

The Figure shows the ceiling tube [6] for the spring arm [4] or extension arm with spring arm [5] with 8 Allen cylinder screws M10 x 25mm ① – 8.8 – DIN EN ISO 4762 as an example. The Figure shows a simplified representation with only the spring arm [4] or the extension arm with spring arm [5] without pre-assembled cables.

1. Place the ceiling tube [6] onto the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] and position it in such a way that the chamfered surface ③ is almost at right angles to the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] as illustrated in the Figure.

#### ⚠ WARNING



#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Assign the Allen cylinder screws ① to the ceiling tube [6].
2. Assign the fixing screws to the ceiling tube [6] type:
    - ceiling tube [6] for the spring arm [4] or the extension arm with spring arm [5]:
      - 8 Allen cylinder screws M10 x 25mm ① – 8.8 – DIN EN ISO 4762 and 8 lock washers S10 ②.
    - ceiling tube [6] for XL extension arm with spring arm [5]:
      - 10 Allen cylinder screws M10 x 30mm ① – 8.8 – DIN EN ISO 4762 and 10 lock washers S10 ②.
  3. Fit the Allen cylinder screws ① with lock washers ②.
  4. At the position of the pre-assembled cable ④ leave the threaded hole ⑤ free and do not screw in an Allen cylinder screw ①.
  5. Screw the ceiling tube [6] onto the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] using 7 or 9 Allen cylinder screws ① and lock washers ②.
  - Use an extension tool to tighten the 7 or 9 Allen cylinder screws ①.

#### ⚠ WARNING

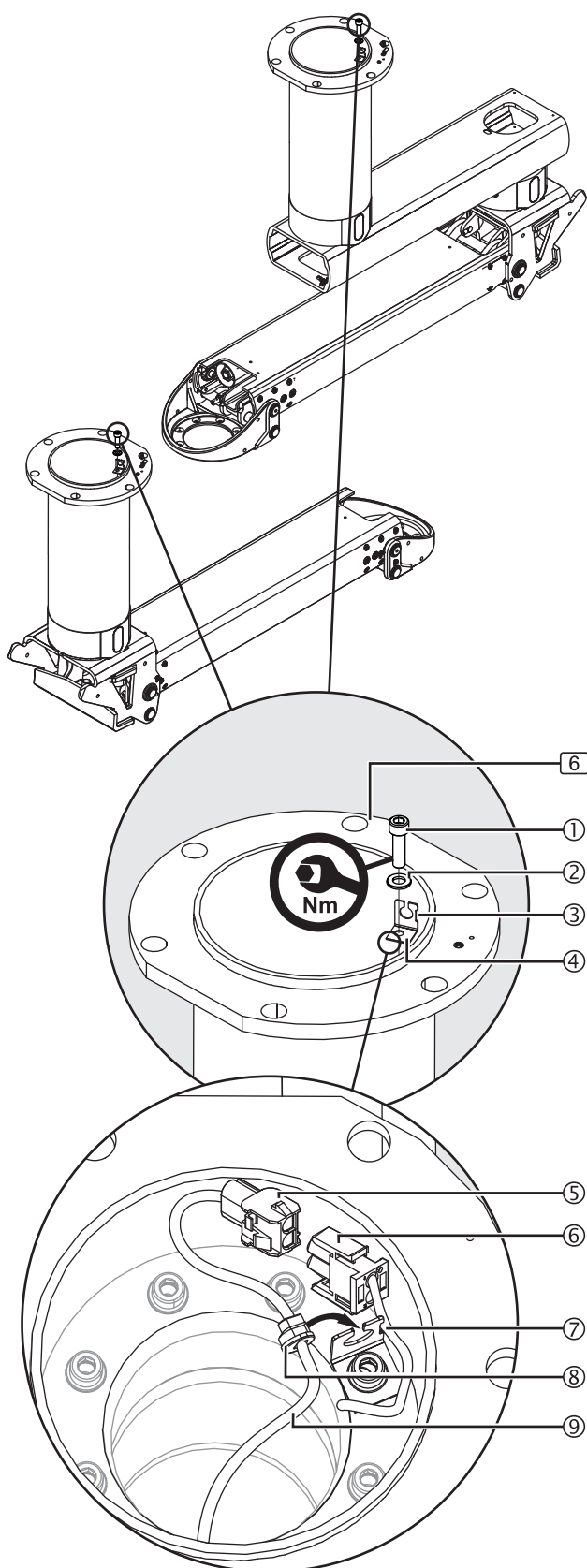


#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten the Allen cylinder screws ① with a tightening torque of 40Nm.
6. Check that the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] is securely in place:
    - The ceiling tube [6] must be level with the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5].
    - The 7 or 9 Allen cylinder screws ① must be fitted with lock washers ②.
    - The 7 or 9 Allen cylinder screws ① must be tightened to 40Nm.
  7. Mount the strain relieving mechanism in the ceiling tube [6] as described in Chapter 7.2.2 on page 37.

Figure 18: Mounting the strain relieving mechanism in the ceiling tube



## 7.2.2 Mounting the strain relieving mechanism in the ceiling tube

(See "Figure 18")

The Figure shows the ceiling tube [6] with 8 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 as an example.

The Figure shows a simplified representation with only the spring arm [4] and the extension arm with spring arm [5] without pre-assembled cables.

1. Insert an Allen cylinder screw M10 x 25mm [1] or an Allen cylinder screw M10 x 30mm [1] and a lock washer S10 [2] into the strain relief holder [4].
2. Position the strain relief holder [4] in the ceiling tube [6] in such a way that the cutout [3] of the strain relief holder [4] points towards the ceiling tube wall.
3. Place the pre-assembled cable [7] in the cutout [3] of the strain relief holder [4].
4. Screw the strain relief holder [4] onto the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] using the Allen cylinder screw [1] and the lock washer [2].
  - Make sure that the cable is not [7] not squeezed.
5. Establish the plug connection [5] / [6] with the control cable included in the scope of delivery [9] and then push the strain relief mechanism [8] into the strain relief holder [4].
6. Check that the strain relief mechanism [8] is securely in place:
  - The control cable [9] must be securely strain-relieved in the strain relief mechanism [4].
7. Route the control cable [9] through the ceiling tube [6] and the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] towards the control board.

### WARNING

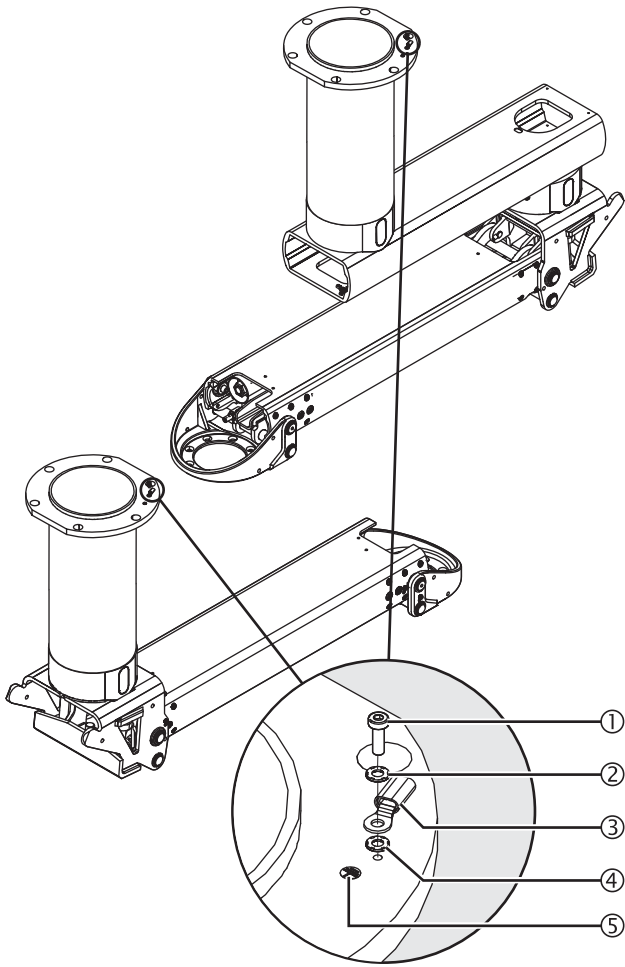


#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten the Allen cylinder screw [1] with a tightening torque of 40Nm.

Figure 19: Subsequently mounting the earthing cable to the ceiling tube



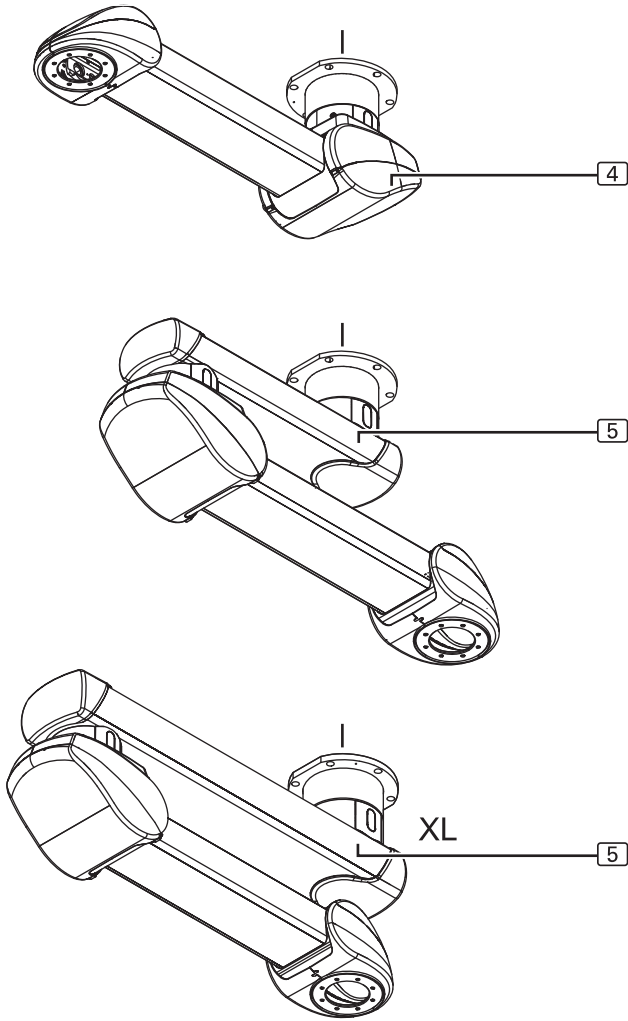
### 7.2.3 Subsequently mounting the earthing cable to the ceiling tube

(See "Figure 19")

The system is delivered with the earthing cable pre-assembled!

1. Fit 1 lock washer S4 ②/④ each above and below the ring cable lug ③ of the earthing cable 4mm<sup>2</sup> (approx. 1 m long).
2. Using 1 Allen cylinder screw M4 x 12mm – DIN 912 ① screw the ring cable lug ③ and the lock washers S4 ②/④ onto the earthing point ⑤.
3. Tighten the Allen cylinder screw M4 x 12mm ①.
4. Continue the installation as described in Chapter 8 on page 39.

Figure 20: Components described in this chapter

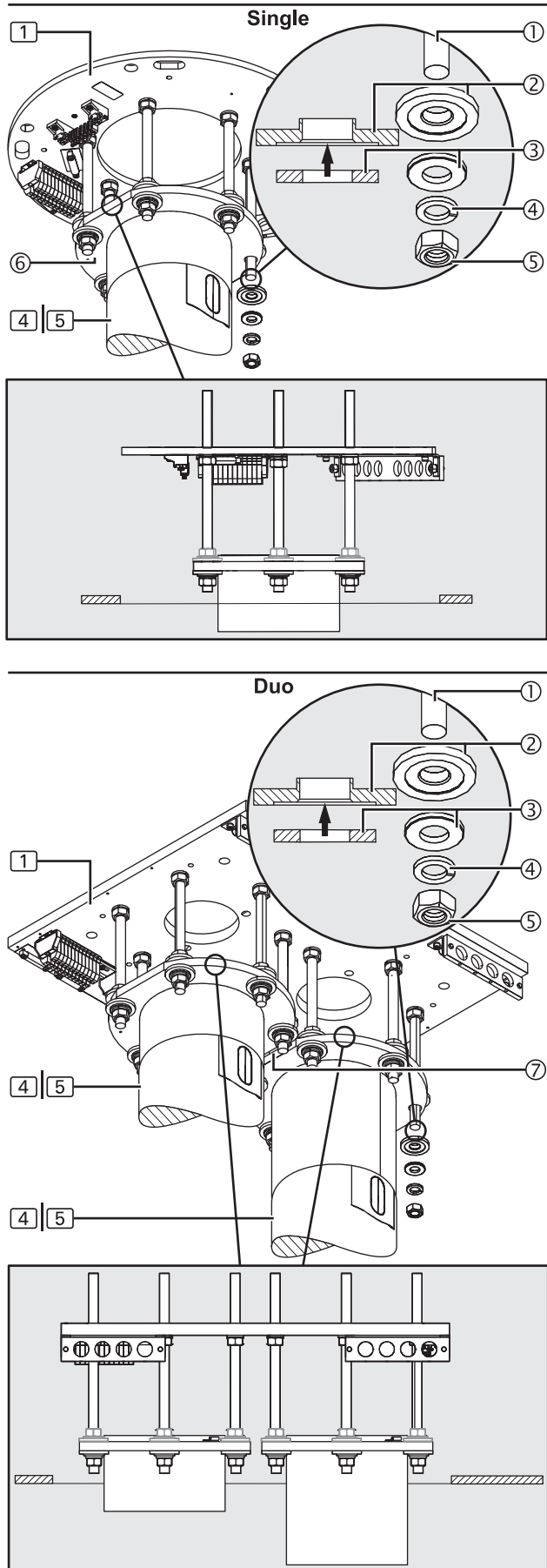


## 8.1 Components described in this chapter

(See "Figure 20")

- The spring arm (4) or the extension arm with spring arm (5) or the XL extension arm with spring arm (5) illustrated in the Figure is mounted to the threaded bolts of the interface plate (1).
- The Figure shows a simplified representation with only the spring arm (4) or the extension arm with spring arm (5) or the XL extension arm with spring arm (5) without cables.
- The installation is described in the following chapters. It is identical for the various components.

Figure 21: Mounting a ceiling tube



## 8.2 Mounting a ceiling tube

(See "Figure 21")

The Figure only shows a simplified representation of the flange ⑥ with ceiling tube to be mounted to the threaded bolts. Further components pre-assembled to the flange ⑥, such as the spring arm, extension arm, cables, etc. are not represented.

### ⚠ WARNING



**Risk of parts falling off**

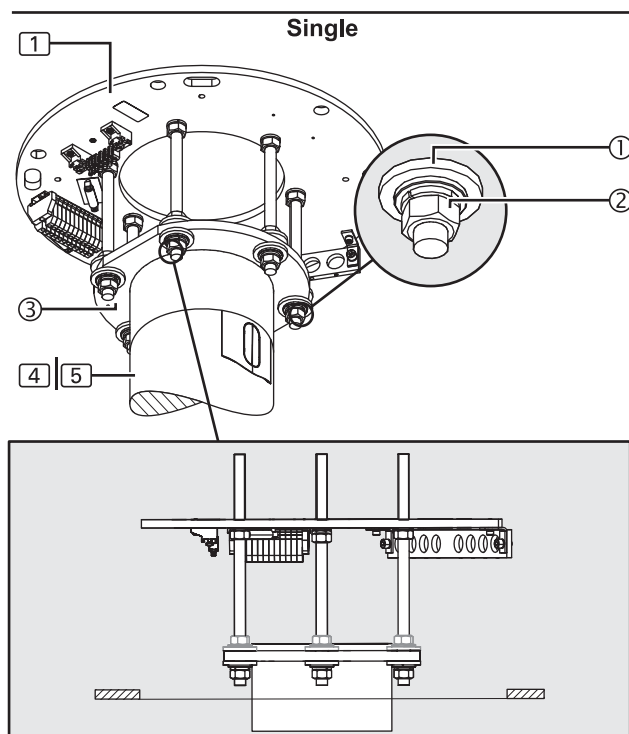
**Make sure that no-one is standing underneath the components of the pendant system.**

1. Securely fasten the flange ⑥ of the ceiling tube with the spring arm ④ or the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ to a suitable lifting device and position it under the threaded bolts M16 ① of the interface plate ①.

### NOTE – Position of the flanges on the Duo version

- The flanges have a chamfered surface ⑦ in order to ensure that they can be mounted at the same height.
  - Mount the flanges such that the chamfered surfaces ⑦ are aligned towards each other as illustrated in the Figure.
2. Insert the flange ⑥ of the ceiling tube with the spring arm ④ or the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ into the 6 threaded bolts M16 ① of the interface plate ①.
  3. Remove the previously attached adhesive or elastic tape from the threaded bolts ①.
  4. For each threaded bolt M16 ①, place 1 plastic insulating disc ① (as illustrated in the Figure) in such a way that the flat washer with an external diameter of 34 mm ③ (see arrow in the detailed representation in the Figure) sits in the plastic insulating disc ①.
  5. For each threaded bolt M16 ①, place 1 flat washer with an external diameter of 34 mm ③, 1 spring disc ④ and 1 hexagonal nut M16 ⑤.
  6. Component on the interface plate ①:
    - Align the Single version as described in Chapter 8.3 on page 41.
    - Align the Duo version as described in Chapter 8.4 on page 43.

Figure 22: Aligning the spring arm / extension arm with the interface plate, Single



### 8.3 Aligning the spring arm / extension arm with the interface plate, Single

(See "Figure 22")

The Figure only shows a simplified representation of the flange ③ with ceiling tube to be mounted to the threaded bolts. Further components pre-assembled to the flange ③, such as the spring arm, extension arm, cables, etc., are not represented.

#### NOTE – Positioning problems and inclination

Precise horizontal alignment is essential in order to ensure that the pendant system can be freely moved and securely positioned, and to avoid inclination.

#### ⚠ WARNING



#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten all hexagonal nuts M16 ② on the flange with a tightening torque of 100Nm.

1. Choose 1 of the 6 hexagonal nuts M16 ② as a reference point.
2. Screw the 6 hexagonal nuts M16 ② under the flange ③ crosswise onto the flange ③ and tighten them to 100Nm.

#### NOTICE

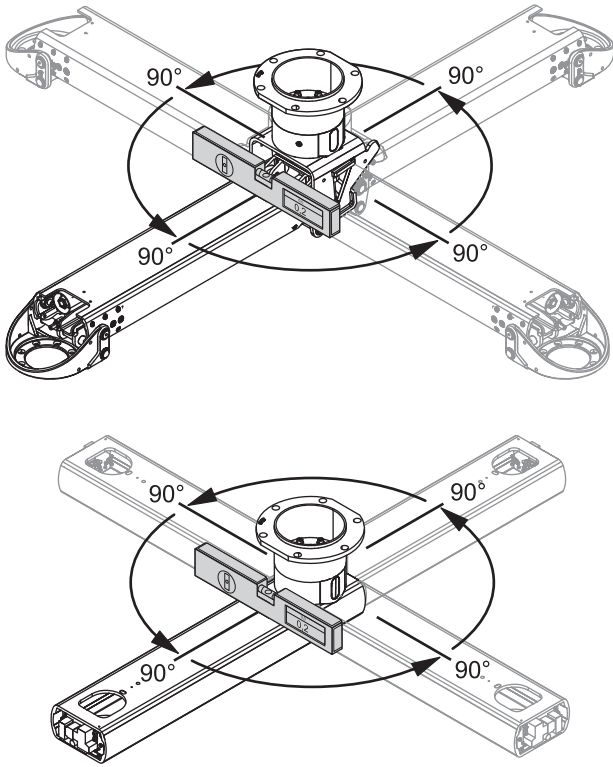
#### Destruction of the cables in the extension arm / spring arm

There is a risk of destroying or damaging the cables in the extension arm / spring arm if an extension arm / spring arm is rotated more than 360 degrees:

- Do not rotate the spring arm ④, the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ more than 350 degrees.
- If required, restrict the swivel range of the spring arm ④, the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ as described in Chapter 15.7 on page 90.

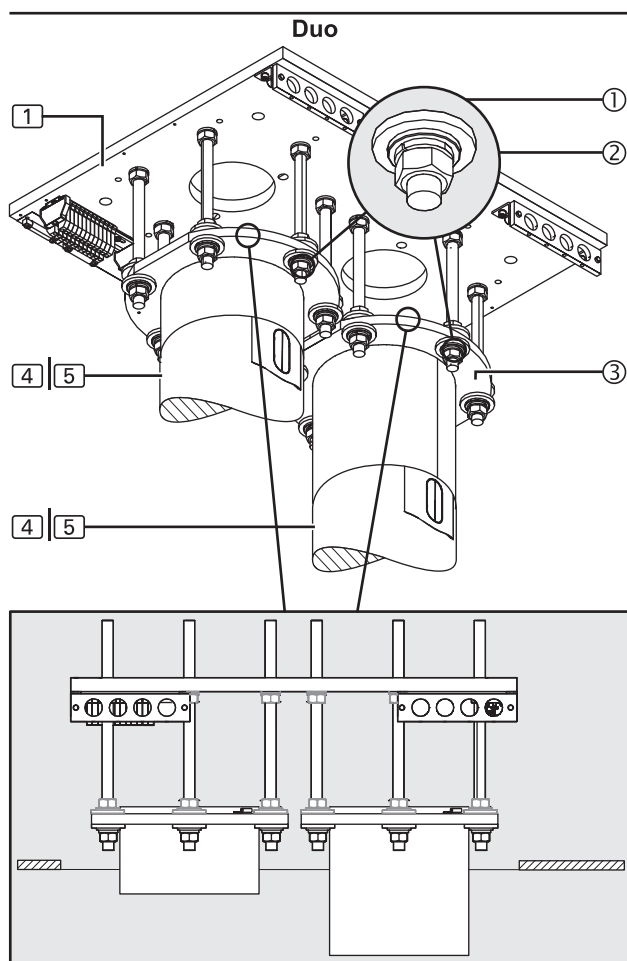
3. Remove the transport lock (band) from the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ – Dual arm type and dismantle the pre-assembled swivel stop as described in Chapter 15.7.4 on page 92 if required. Next, turn the lower extension arm into the extension of the upper extension arm.
4. Continuation on the next page.

Figure 23: Checking the horizontal alignment of the spring arm / extension arm



5. Check the horizontal alignment of the spring arm / extension arm (see "Figure 23: on page 42"):
  - Place the digital spirit level at right angles to the spring arm or extension arm length on the spring arm or extension arm (near the flange ③).
  - Rotate the spring arm or extension arm 90 degrees in various directions and check the horizontal alignment.
  - The deviation from the horizontal must not exceed  $\pm 0.2$  degrees.
  - In case of deviations by more than  $\pm 0.2$  degrees the spring arm or extension arm must be realigned. To do this, repeat the installation steps described above.
6. Check that all hexagonal nuts M16 ② are securely in place:
  - The 12 hexagonal nuts M16 ② must be level with the flange ③.
  - The 12 plastic insulating discs ① above and below the flange ③ must sit in the flange ③ and must not be damaged.
  - The 12 hexagonal nuts M16 ② must be tightened to 100Nm.

Figure 24: Aligning the spring arm / extension arm with the interface plate, Duo



## 8.4 Aligning the spring arm / extension arm with the interface plate, Duo

(See "Figure 24")

The Figure only shows a simplified representation of the flange ③ with ceiling tube to be mounted to the threaded bolts. Further components pre-assembled to the flange ③, such as the spring arm, extension arm, cables, etc., are not represented.

### NOTE – Positioning problems and inclination

Precise horizontal alignment is essential in order to ensure that the pendant system can be freely moved and securely positioned, and to avoid inclination.

### ⚠ WARNING



#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten all hexagonal nuts M16 ① on the flange with a tightening torque of 100Nm.

1. Choose 1 of the 6 hexagonal nuts M16 ② on the first flange as a reference point.
2. Screw the 6 hexagonal nuts M16 ② under the flange ③ crosswise onto the flange ③ and tighten them to 100Nm.
3. Repeat the steps for the second flange.

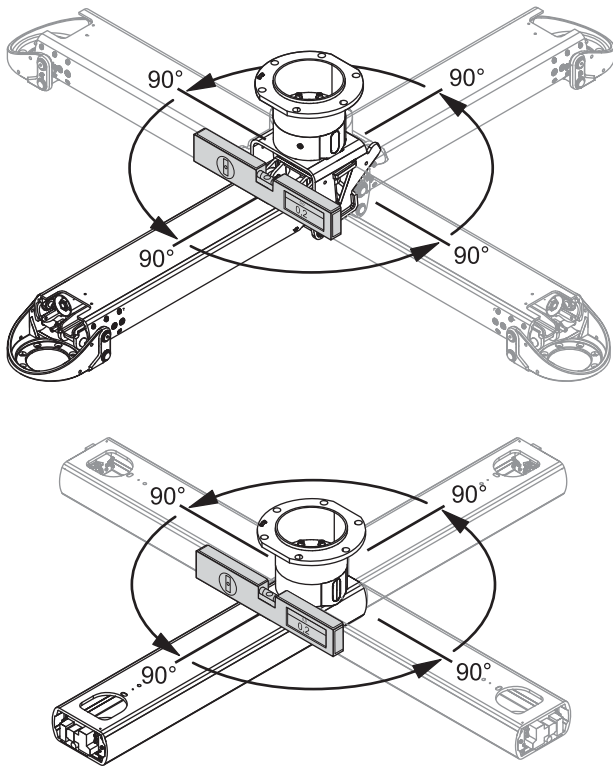
### NOTICE

#### Destruction of the cables in the extension arm / spring arm

There is a risk of destroying or damaging the cables in the extension arm / spring arm if an extension arm / spring arm is rotated more than 360 degrees:

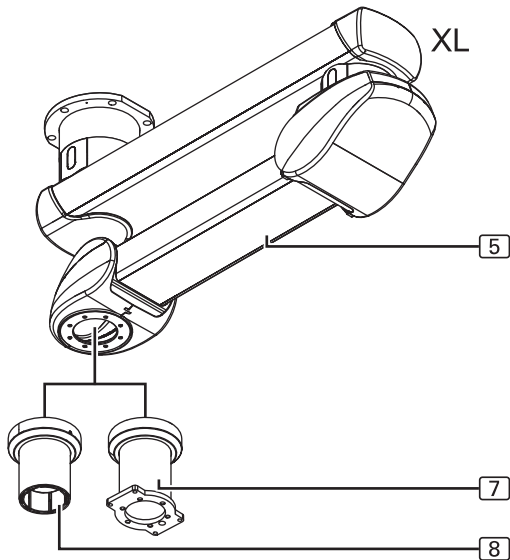
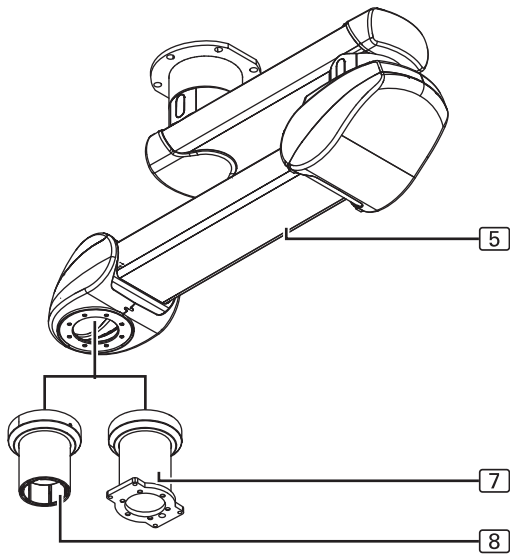
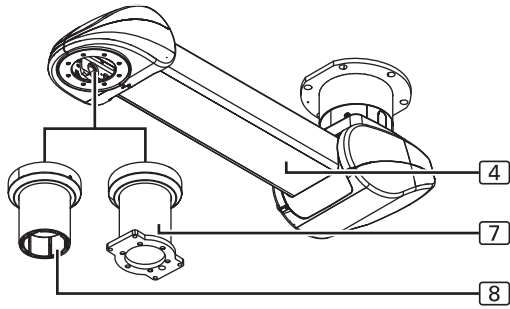
- Do not rotate the spring arm ④, the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ more than 350 degrees.
  - If required, restrict the swivel range of the spring arm ④, the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ as described in Chapter 15.7 on page 90.
4. Remove the transport lock (band) from the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ – Dual arm type and dismantle the pre-assembled swivel stop as described in Chapter 15.7.4 on page 92 if required. Next, turn the lower extension arm into the extension of the upper extension arm.
  5. Continuation on the next page.

Figure 25: Checking the horizontal alignment of the spring arm / extension arm



6. Check the horizontal alignment of the spring arm / extension arm (see "Figure 25: on page 44"):
  - Place the digital spirit level at right angles to the spring arm or extension arm length on the spring arm or extension arm (near the flange ③).
  - Rotate the spring arm or extension arm 90 degrees in various directions and check the horizontal alignment.
  - The deviation from the horizontal must not exceed  $\pm 0.2$  degrees.
  - In case of deviations by more than  $\pm 0.2$  degrees the spring arm or extension arm must be realigned. To do this, repeat the installation steps described above.
7. Check that all hexagonal nuts M16 ② are securely in place:
  - The 24 hexagonal nuts M16 ② must be level with the flange ③.
  - The 24 plastic insulating discs ① above and below the flange ③ must sit in the flange ③ and must not be damaged.
  - The 24 hexagonal nuts M16 ② must be tightened to 100Nm.

Figure 26: Components described in this chapter

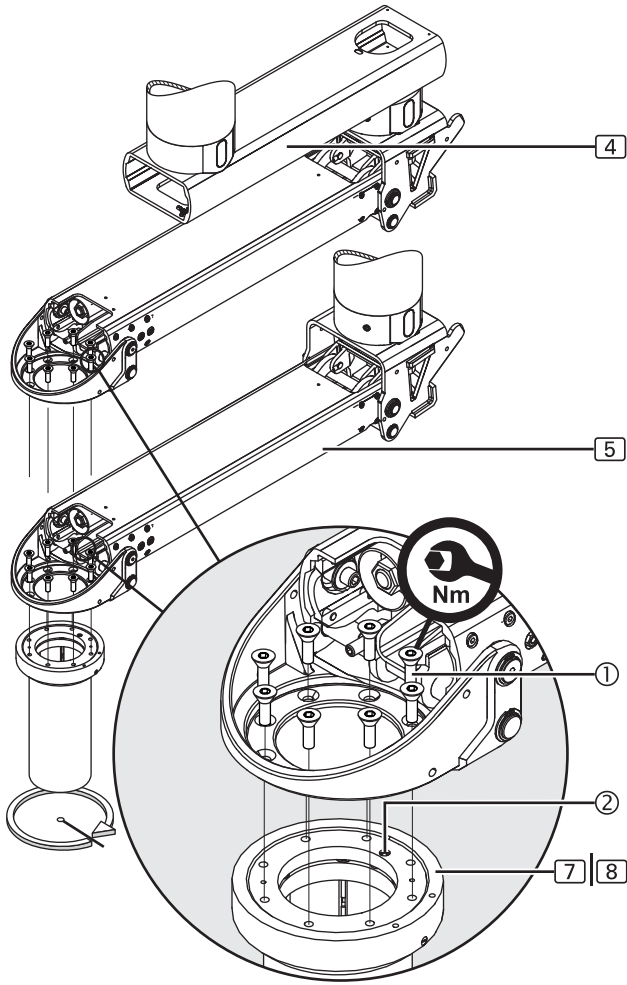


### 9.1 Components described in this chapter

(See "Figure 26")

- The Drop tube CEMOR (7) illustrated in the Figure or the Drop tube Navigator M6 (8) is mounted to the spring arm (4) or the extension arm with spring arm (5) or the XL extension arm with spring arm (5).
- The Figure shows a simplified representation with only the spring arm (4) or the extension arm with spring arm (5) or the XL extension arm with spring arm (5) without cables.
- The installation is described in the following chapters. It is identical for the various components.

Figure 27: Mounting the Drop tube to the spring arm



## 9.2 Mounting the Drop tube to the spring arm

(See "Figure 27")

1. Place the Drop tube CEMOR [7] or the Drop tube Navigator M6 [8] under the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5] such that the end stop [2] in the Drop tube CEMOR [7] or in the Drop tube Navigator M6 [8] points away from the spring arm side and the fixing holes fall in line.

### NOTE – Defining the swivel range

- In order to be able to swivel the Navigator M6 / CEMOR to the left (anti-clockwise), the Drop tube must be mounted with the end stop [2] on the right-hand side as illustrated in the Figure.
  - In order to be able to swivel the Navigator M6 / CEMOR right (clockwise), the Drop tube must be mounted with the end stop [2] on the left-hand side.
2. Screw the Drop tube CEMOR [7] or the Drop tube Navigator M6 [8] onto the spring arm using 8 Allen countersunk screws M10 x 25mm [1] – 10.9 – DIN EN ISO 10642.

### ! WARNING

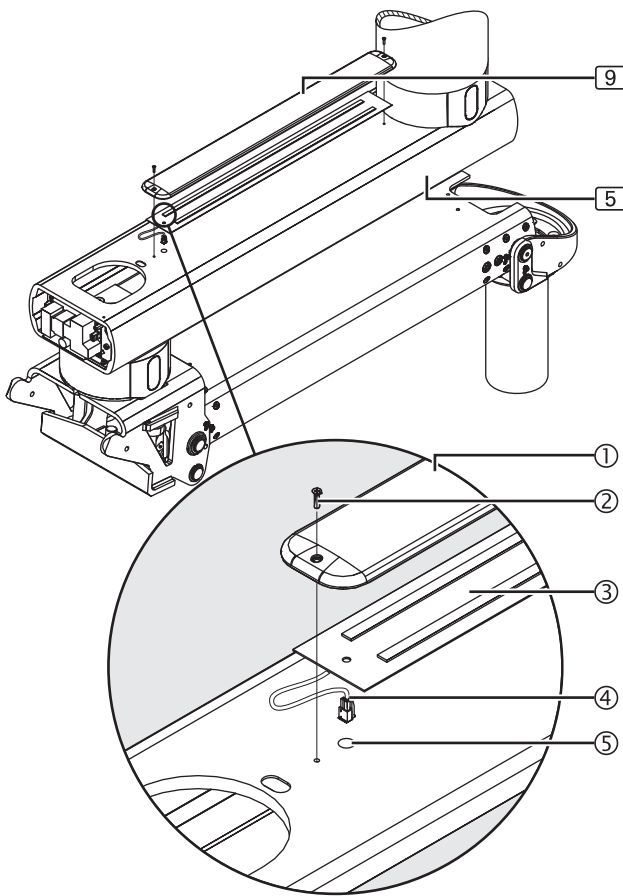


#### Pendant system dropping

The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten the 8 Allen countersunk screws [1] with a tightening torque of 40Nm.
3. Check that the Drop tube CEMOR [7] or the Drop tube Navigator M6 [8] is securely in place:
    - The Drop tube CEMOR [7] or the Drop tube Navigator M6 [8] must be level with the spring arm.
    - The Allen countersunk screws M10 x 25mm [1] – 10.9 – DIN EN ISO 10642 must be tightened to 40Nm.

Figure 28: Mounting the extension arm lighting



## 10.1 Mounting the Extension Arm Lighting (for Retrofit only)

(See "Figure 28")

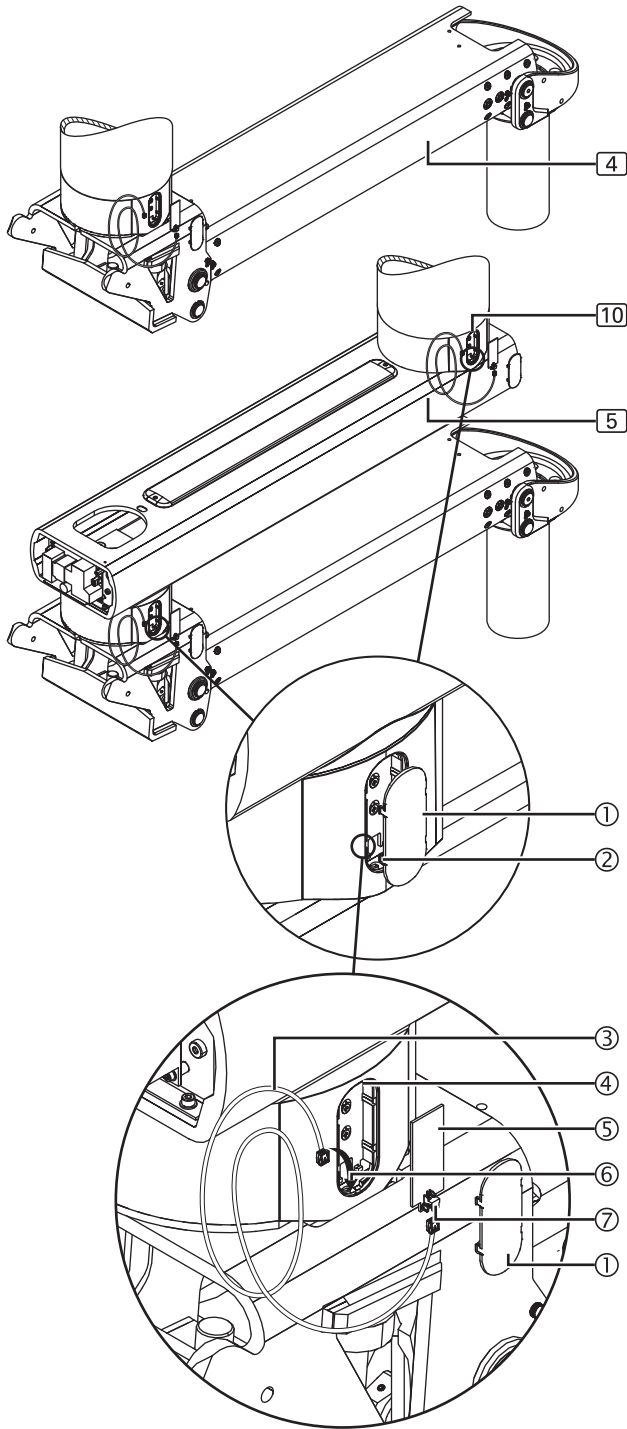
Upon delivery of the system from the factory the following options are pre-assembled:

The Figure shows the extension arm with spring arm (5). The installation procedure for the XL extension arm with spring arm (5) version is identical.

The indirect extension arm lighting (9) (for extension arms from a length of 800mm possible, for XL extension arms from a length of 1000mm possible) is mounted to the top side of the extension arm. The Figure shows a simplified representation with only the extension arm with spring arm (5) or the XL extension arm with spring arm (5) without pre-assembled cables.

1. Dismantle the 3 sealing plugs (not illustrated) from the top side of the extension arm and dispose of them in compliance with statutory regulations.
2. Route the connecting cable (4) on the basic carrier with LEDs (3) through the mounting aperture (5) into the extension arm without bending it.
3. Place the cover (1) onto the basic carrier with LEDs (3) and screw it on using 2 countersunk screws M4 x 16mm (2) – DIN EN ISO 10642.
4. Check that the extension arm lighting (9) is securely in place:
  - The extension arm lighting (9) must be level with the extension arm.
  - The connecting cable (4) on the basic carrier with LEDs (3) must sit in the extension arm.
  - The 2 countersunk screws M4 x 16mm (2) – DIN EN ISO 10642 must be screwed on.

Figure 29: Mounting the brake indicators



## 10.2 Mounting the brake indicators (for retrofit only)

(See "Figure 29")

Upon delivery of the system from the factory the following options are pre-assembled:

The Figure shows the extension arm with spring arm [5]. The installation procedure for the XL extension arm with spring arm [5] version is identical.

The brake indicators [10] are mounted to the swivel or brake points of the spring arm [4] or the extension arm with spring arm [5] or the XL extension arm with spring arm [5]. The 4 brake indicators [10] are mounted to the Dual arm version, whereas the 2 brake indicators are mounted to the Single arm version.

1. Gently disengage the 2 / 4 pre-assembled plastic covers ① on all 4 latches ② , remove them and keep them in a safe place.
2. Plug 1 power cable connector ③ onto the connector socket ⑦ of the lighting board ⑤ .  
Colour code of the lighting boards ⑤ :
  - Upper bearing = green (No. 1546534)
  - Intermediate bearing = blue (No. 1546650)
3. Route the power cable ③ through the hole ⑥ (see arrow) into the extension arm / spring arm.
  - Make sure that the plugs and power cable ③ are not damaged.
  - The power cable ③ must sit entirely in the extension arm / spring arm.
4. Hook the lighting board ⑤ at the bottom side into the mounting aperture ④ and gently push it in until it audibly snaps into place.
  - Do not push the lighting board ⑤ into the mounting aperture ④ with force.
5. Check that the lighting board ⑤ is securely in place:
  - The lighting board ⑤ must sit in the mounting aperture ④ without being wedged.

### NOTE – Colour code of the plastic covers

Pendant system Navigator Lift™ 180 Dual / Navigator Lift™ XL 180 Dual – Dual arm type:

- The upper plastic cover ① is green
- The lower plastic cover ① is blue

Pendant system Navigator Lift™ 180 Single – Single arm type:

- The plastic cover ① is green

6. Gently push the 2 / 4 plastic covers ① into the mounting aperture ④ until the 4 latches ② audibly snap into place.
7. Check that the plastic covers ① are securely in place:
  - The plastic covers ① must sit in the mounting aperture ④ without being wedged.
8. Position the Navigator M6 / CEMOR under the pendant system as described in the Installation Instructions of the Navigator M6 / CEMOR.
  - The supply cables (power and earthing cables, gas and compressed air hoses) are pre-assembled in the Navigator M6 / CEMOR.
  - Order-specific cables, including nurse call and phone cables, must be separately routed through the pendant system.

## 11.1 Versions

The insertion of the cables is described using the example of the extension arm with spring arm [5]. The installation procedure for the XL extension arm with spring arm [5] version is identical.

## 11.2 Safety instructions

### ⚠ WARNING



#### Electric shock hazard

**Power cables may have been laid in the pendant system. Contact with energised components presents a danger to life from electric shock. Motor-driven, mobile device components can cause injury in the case of being switched on unintentionally. Prior to any installation and adjustment work, the pendant system must be disconnected from the mains:**

- Disconnect all poles of the power supply source from the mains and prevent it from being reconnected accidentally.
- Check whether the pendant system is de-energised.
- Earth and short-circuit the pendant system.
- Cover and shield any adjacent energised parts.

#### Damaged power cables, gas hoses and compressed air hoses

**Damaged power cables can carry an electric voltage of 230V (120V) which energises the pendant system, and supply gases can escape from damaged supply hoses:**

- Check all cables and hoses for damage. Make sure to carefully insert them without cables/hoses crossing each other, without loops and without twisting.
- The cables and tubes must be laid in the pendant system in such a way that they are not exposed to tensile stress.
- Cables and hoses must be routed straight upwards out of the flange in order to prevent damage (e.g. rubbing of the sheathing) and enable their free rotation.
- Protruding cables and hoses must not be placed in the Navigator M6 or on the flanges, but must be placed on the interface plate and secured against falling using cable retainers.
- Electric cables must be laid in accordance with regional regulations (in a spiral coiled tube if required).

### 11.3 Connecting cables to the extension arm with spring arm, Dual arm, with Navigator M6

The supply cables and hoses are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the replacement of supply cables and hoses.

1. Observe the safety instructions in Chapter 11.2 on page 49.

#### 11.3.1 Checking the power pack and distributor board connections

(See "Figure 30")

2. Check that the supply cables are mounted with the plugs ④/⑤ and ⑩/⑪ between the power pack ① and the distributor board ③. If missing, mount the connecting cables included in the scope of delivery with the plugs ④/⑤ and ⑩/⑪ as illustrated in the Figure.

#### 11.3.2 Connecting the electromagnetic brakes

(See "Figure 30")

Connecting the upper brake

3. Establish the assembly connection ⑭ between the cable ⑬ and the extension cable ⑫ included in the scope of delivery as described in Chapter 7.2.2 on page 37.
4. Plug the extension cable connector ⑫ onto the corresponding distributor board socket ③ as illustrated in the Figure.

Connecting the lower brake

5. Plug the cable connector ⑩ onto the corresponding distributor board socket ③ as illustrated in the Figure.

#### 11.3.3 Connecting the control cable of the brakes

(See "Figure 30")

6. Insert the control cable ⑩ into the mounting aperture in the spring arm bearing support ⑧ and lay it above the swivel axis (revolute joint) ⑦.
7. Route the control cable ⑩ through the strain relieving mechanism ② and plug it onto the corresponding distributor board socket ③.
8. Establish the assembly connection ⑩ between the control cable ⑨ routed out of the Navigator M6 and the control cable ⑩.

#### 11.3.4 Mounting the power cable

(See "Figure 30")

9. Plug the power cable ⑥ included in the scope of delivery onto the corresponding distributor board socket ③ and route it through the extension arm towards the interface plate as illustrated in the Figure.
- If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 30: Connecting the cables to the extension arm with spring arm, Dual arm, Navigator M6

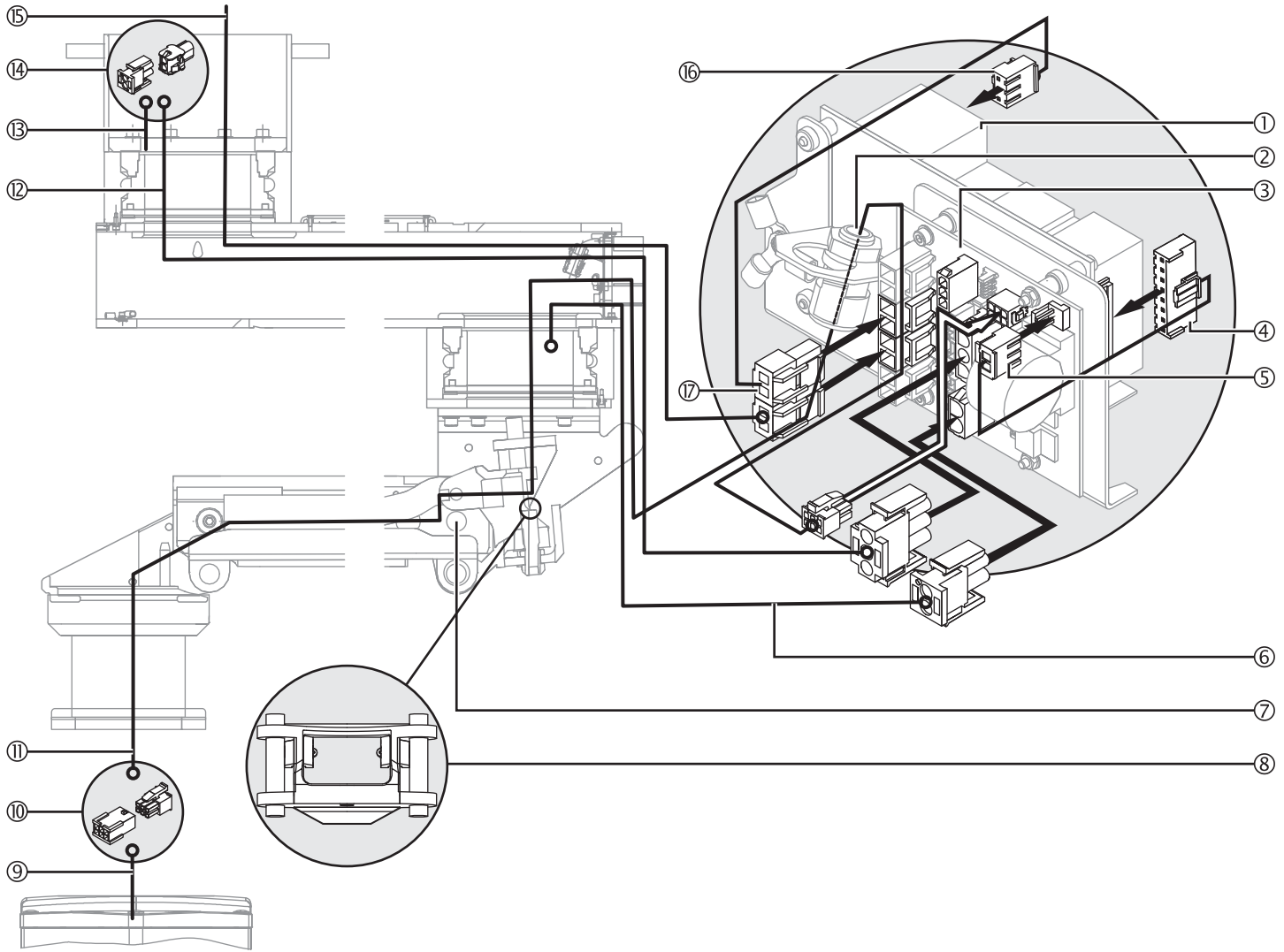


Table 02: Cable assignment: extension arm with spring arm, Dual arm, with Navigator M6

No. in Fig. 30	From	To	Designation	Length [mm]	Remark
⑥	Bearing unit	Distributor board	-	100	Integrated into the bearing unit
⑨	Front plate Navigator M6	Drop tube	Cable interface Navigator M6/ Navigator M6 socket	-	Integrated into the Navigator M6
⑩	Distributor board	Navigator M6	PCB/Navigator M6 socket	2600	-
⑫	Bearing point 1	Distributor board	Brake cable1/PCB, 2-arm	1300 1700 2100	Extension arm length 1 = 600/800 Extension arm length 1 = 1000/ 1200 Extension arm length 1 (XL only) = 1400/1600
⑬	Bearing unit	Cable ⑫, distributor board	-	100	Integrated into the bearing unit
⑮	Mains connection	Distributor board	Mains cable/PCB	5000	-

## 11.4 Connecting optional accessories to the extension arm with spring arm, Dual arm, with Navigator M6

1. Observe the safety instructions in Chapter 11.2 on page 49.

### 11.4.1 Connecting the optional brake indicators

(See "Figure 31")

2. Route the 2 cables ⑫ of the upper brake indicators through the extension arm and the mounting aperture ② of the power pack ① and then plug them onto the corresponding distributor board sockets ③ on the power pack ①.
3. Route the 2 cables ④ of the lower brake indicators through the mounting aperture ② of the power pack ① and plug them onto the corresponding distributor board sockets ③.

### 11.4.2 Connecting the optional extension arm lighting

(See "Figure 31")

4. Establish the assembly connection ⑩ between the extension arm lighting cable ⑬ and the extension cable ⑭ included in the scope of delivery, and then route it through the extension arm and the mounting aperture ② of the power pack ① and out of the Drop tube.
5. Insert the extension cable ⑭ into the mounting aperture in the spring arm bearing support ⑥ and then lay it above the swivel axis (revolute joint) ⑦.
6. Establish the assembly connection ⑨ between the extension cable ⑭ and the control cable ⑧ routed out of the Navigator M6.

### 11.4.3 Connecting an optional sound or lighting cable

(See "Figure 31")

7. Route the cable ⑦ through the spring arm above the swivel axis (revolute joint) ⑦ and then route it out of the mounting aperture in the bearing support ⑥.
8. Plug the cable connector ⑦ onto the corresponding distributor board socket ③.

Figure 31: Connecting optional accessories to the extension arm with spring arm, Dual arm, with Navigator M6

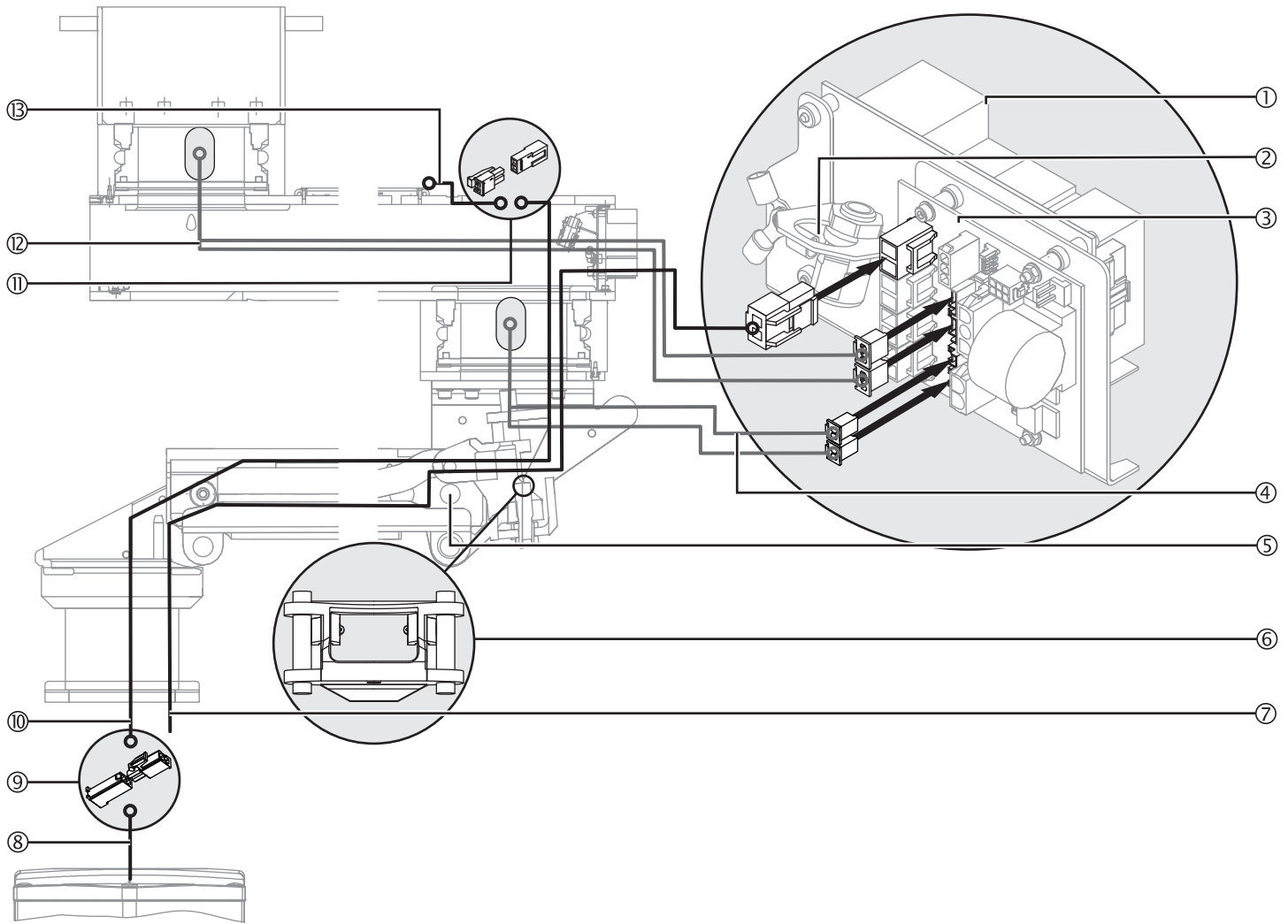


Table 03: Cable assignment: extension arm with spring arm, Dual arm, with Navigator M6 – options

No. in Fig. 31	From	To	Designation	Length [mm]	Remark
④	Lower brake indicator	Distributor board	Brakeguide2/PCB cable	700	
⑦	Navigator M6	Distributor board	Navigator M6, PCB 230V cable	3900	Integrated into the Navigator M6
⑧	Navigator M6	Drop tube	Extension arm lighting/Navigator M6 cable	-	Integrated into the Navigator M6
⑩	Extension arm lighting	Navigator M6	Extension arm lighting/Navigator M6 cable	3000	-
⑫	Upper brake indicator	Distributor board	Brakeguide1/PCB cable	1110 1510 1960	Extension arm length 1 = 1000/1200 Extension arm length 1 = 600/800 Extension arm length 1 (XL only) = 1400/1600
⑬	Extension arm lighting	Cable ⑩	-	100	Integrated into the extension arm lighting

## 11.5 Connecting the earthing cables to the extension arm with spring arm, Dual arm, with Navigator M6

(See "Figure 32")

The earthing cables are pre-assembled in the extension arm and the spring arm and must be laid and connected in the direction of the arrow.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Lay and connect the earthing cables in the direction of the arrow illustrated in the Figure, and then route them towards the interface plate if required.
3. Insert the earthing cables into the mounting aperture in the spring arm bearing support ③ and lay them above the swivel axis (revolute joint) ②.
4. Route the mounted earthing cables ① from the flange along the ceiling tube towards the interface plate.
5. Route the earthing cables ④ out of the Navigator M6 through the spring arm above the swivel axis (revolute joint) ② and then route them into the mounting aperture in the bearing support ③ of the spring arm.
6. Route the earthing cables ④ through the extension arm and towards the interface plate.

## 11.6 Routing the supply cables and hoses through the extension arm with spring arm, Dual arm, with Navigator M6

(See "Figure 33")

The power supply cables and gas hoses are pre-assembled in the Navigator M6. Order-specific cables, including nurse call and phone cables, must be separately routed through the pendant system.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Route the supply cables and hoses ① through the spring arm above the swivel axis (revolute joint) ② and then insert it into the mounting aperture in the bearing support ③ of the spring arm:
  - Next, route the Navigator M6 without exerting tensile stress on the supply cables and hoses ①.
  - Make sure that the laid cables are not damaged or torn off.
3. Route the supply cables and hoses ① through the extension arm and towards the interface plate.
4. Route order-specific cables (nurse call, phone, etc.) through the pendant system.
5. Mount the Navigator M6 to the pendant system as described in the Installation Instructions of the Navigator M6.

Figure 32: Connecting the earthing cables to the extension arm with spring arm, Dual arm, with Navigator M6

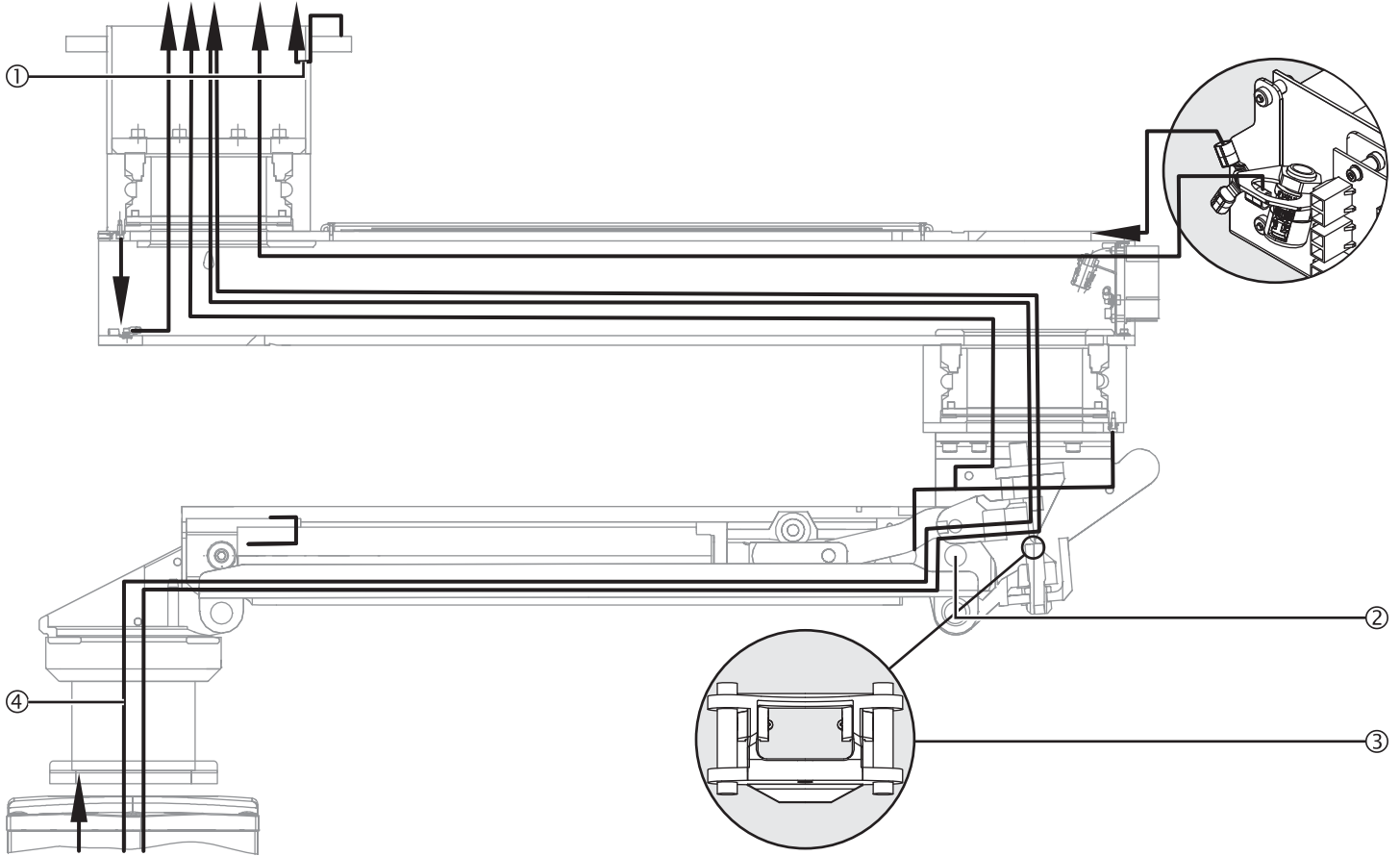
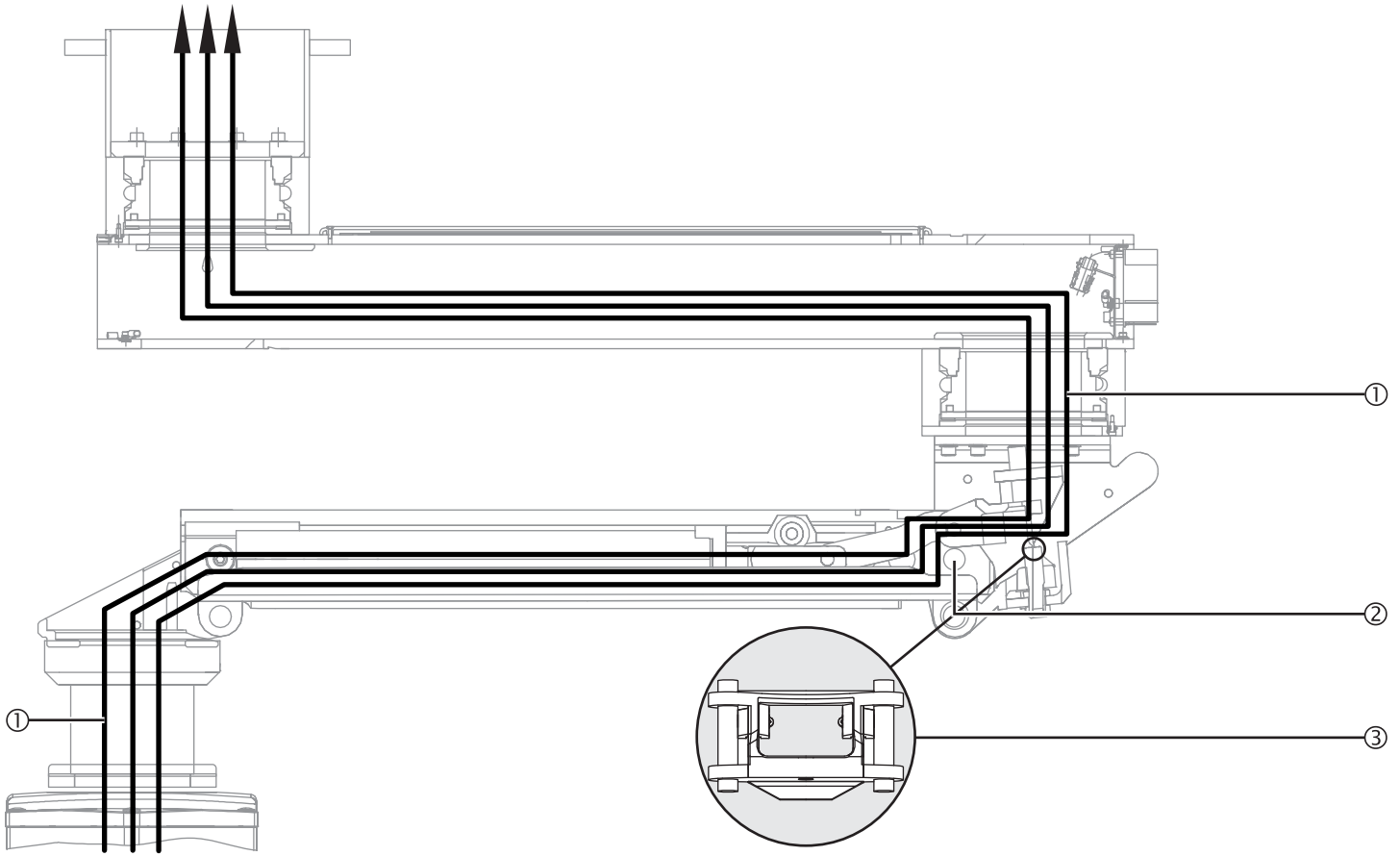


Figure 33: Routing the supply cables and hoses through the extension arm with spring arm, Dual arm, with Navigator M6



## 11.7 Connecting the cables to the extension arm with spring arm, Dual arm, with CEMOR

(See "Figure 34")

The supply cables and hoses are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the replacement of supply cables and hoses.

1. Observe the safety instructions in Chapter 11.2 on page 49.

### 11.7.1 Checking the power pack and distributor board connections

(See "Figure 30")

2. Check that the supply cables are mounted with the plugs ④/⑤ and ⑰/⑱ between the power pack ① and the distributor board ③. If missing, mount the connecting cables included in the scope of delivery with the plugs ④/⑤ and ⑰/⑱ as illustrated in the Figure.

### 11.7.2 Connecting the electromagnetic brakes

(See "Figure 34")

Connecting the upper brake

3. Establish the assembly connection ⑮ between the cable ⑭ and the extension cable ⑬ included in the scope of delivery as described in Chapter 7.2.2 on page 37.
4. Plug the extension cable connector ⑮ onto the corresponding distributor board socket ③ as illustrated in the Figure.

Connecting the lower brake

5. Plug the cable connector ⑩ onto the corresponding distributor board socket ③ as illustrated in the Figure.

### 11.7.3 Connecting the control cable of the brakes

(See "Figure 34")

6. Insert the control cable ⑪ into the mounting aperture in the spring arm bearing support ⑥ and lay it above the swivel axis (revolute joint) ⑦.
7. Route the control cable ⑪ through the strain relieving mechanism ② and plug it onto the corresponding distributor board socket ③.
8. Establish the assembly connection ⑯ between the control cable ⑨ routed out of the Navigator M6 and the control cable ⑪.

### 11.7.4 Mounting the power cable

(See "Figure 34")

9. Plug the power cable ⑫ included in the scope of delivery onto the corresponding distributor board socket ③ and route it through the extension arm towards the interface plate as illustrated in the Figure.
10. Route the power cable ⑫ through the spring arm above the swivel axis (revolute joint) ⑦ and then route it out of the mounting aperture in the bearing support ⑥. Route the power cable ⑫ through the extension arm and towards the interface plate.
  - If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 34: Connecting the cables to the extension arm with spring arm, Dual arm, with CEMOR

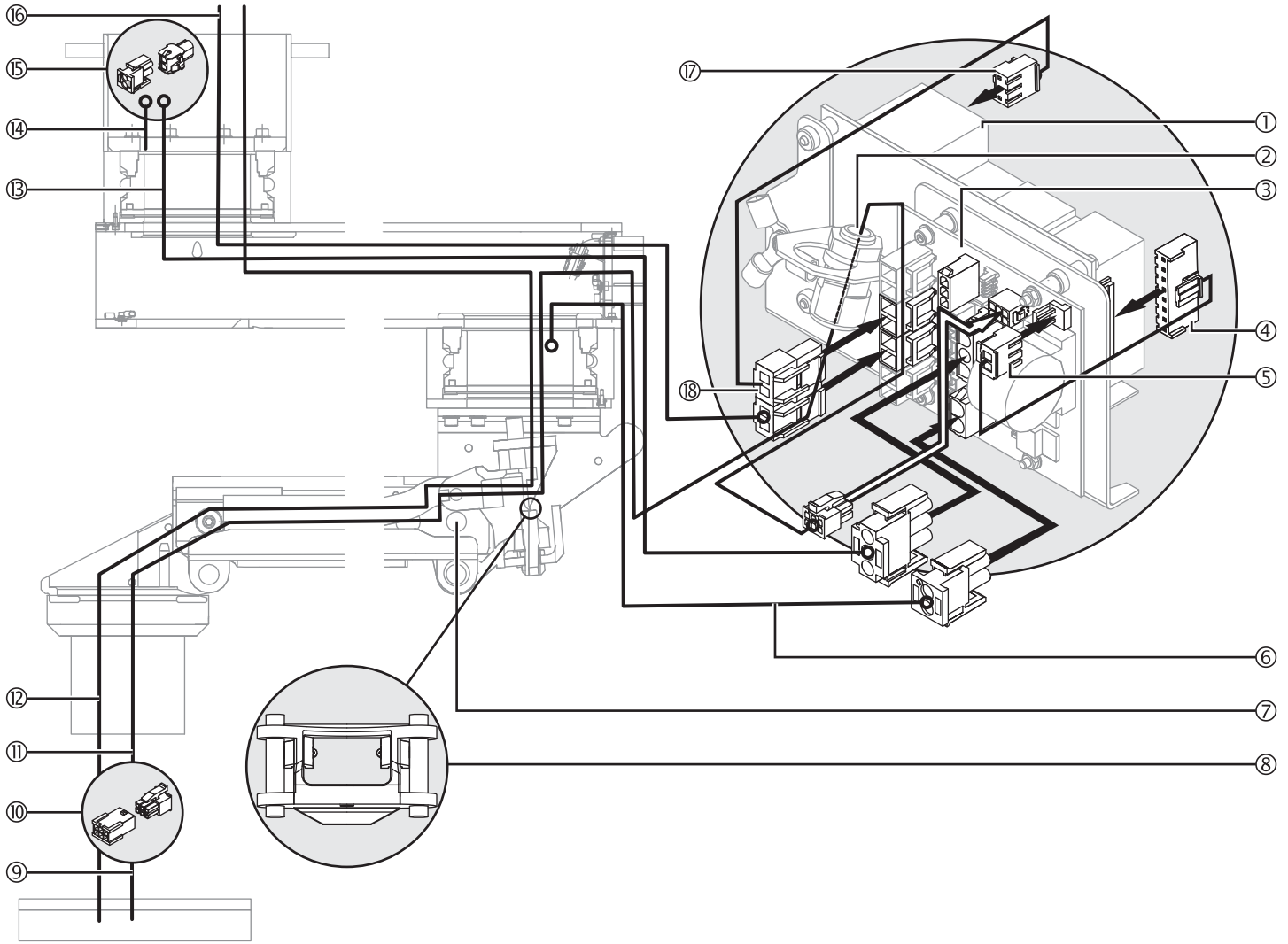


Table 04: Cable assignment: pendant system to the extension arm with spring arm, Dual arm, with CEMOR

No. in Fig. 34	From	To	Designation	Length [mm]	Remark
⑥	Bearing unit	Distributor board	-	100	Integrated into the bearing unit
⑨	Interface CEMOR	Drop tube	Cable interf. CEMOR/socket CEMOR	-	Integrated into the CEMOR
⑪	Distributor board	CEMOR	Cable PCB/CEMOR	2600	-
⑫	Mains connection	CEMOR	-	-	-
⑬	Bearing point 1	Distributor board	Brake cable1/PCB, 2-arm	1300 1700	Extension arm length 1 = 600/800 Extension arm length 1 = 1000/ 1200 Extension arm length 1 (XL only) = 1400/1600
⑭	Bearing unit	Cable ⑬, distributor board	-	100	Integrated into the bearing unit
⑯	Mains connection	Distributor board	Mains cable/PCB	5000	-

## 11.8 Connecting optional accessories to the extension arm with spring arm, Dual arm, with CEMOR

(See "Figure 35")

1. Observe the safety instructions in Chapter 11.2 on page 49.

### 11.8.1 Connecting the optional brake indicators

(See "Figure 31")

2. Route the 2 cables ⑤ of the upper brake indicators through the extension arm and the mounting aperture ② of the power pack ① and then plug them onto the corresponding distributor board sockets ③ on the power pack ①.
3. Route the 2 cables ④ of the lower brake indicators through the mounting aperture ② of the power pack ① and plug them onto the corresponding distributor board sockets ③.

Figure 35: Connecting optional accessories to the extension arm with spring arm, Dual arm, with CEMOR

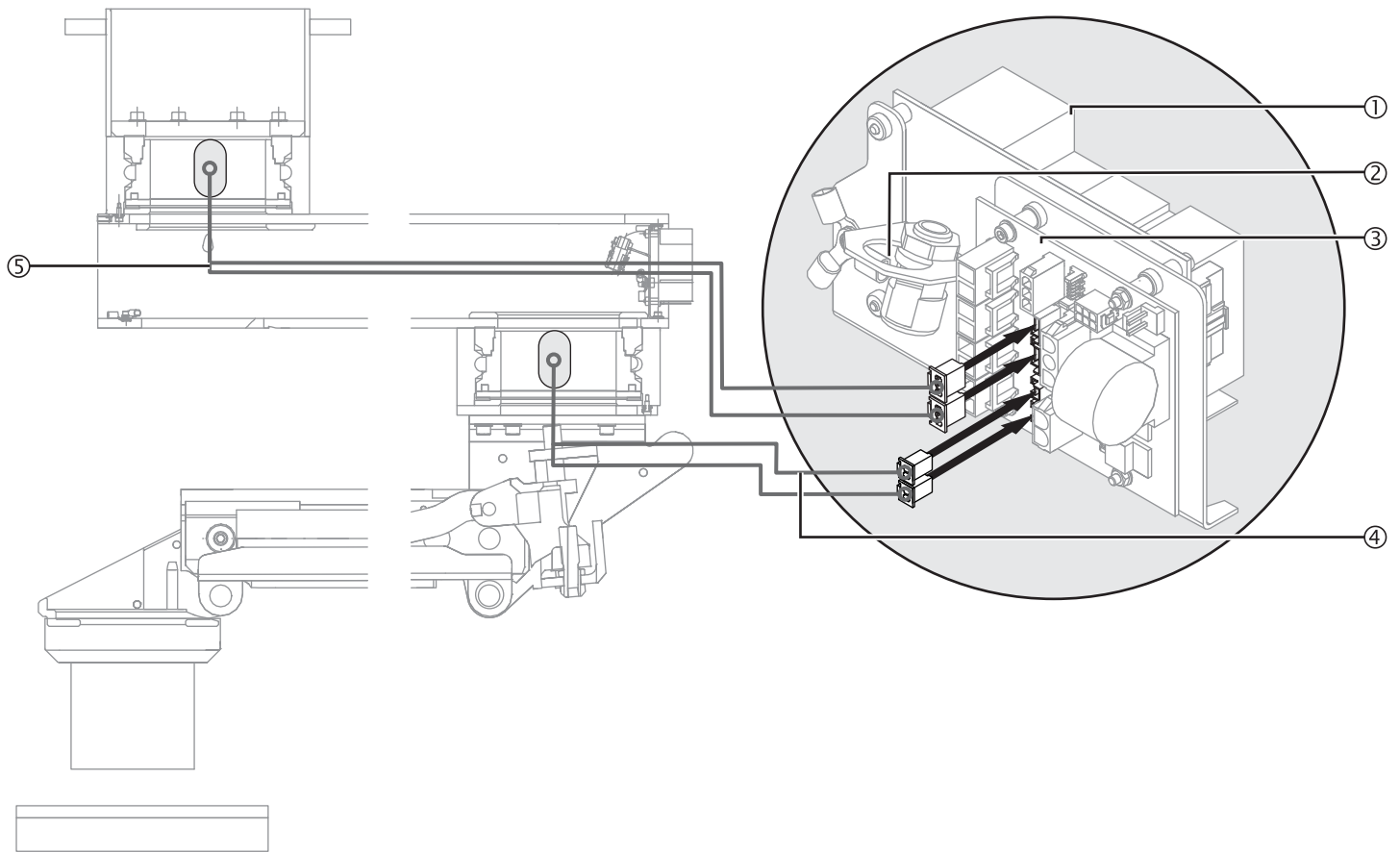


Table 05: Cable assignment: extension arm with spring arm, Dual arm, with CEMOR

No. in Fig. 35	From	To	Designation	Length [mm]	Remark
④	Lower brake indicator	Distributor board	Brakeguide2/PCB cable	700	
⑤	Upper brake indicator	Distributor board	Brakeguide1/PCB cable	1110 1510 1960	Extension arm length 1 = 1000/1200 Extension arm length 1 = 600/800 Extension arm length 1 (XL only) = 1400/1600

## 11.9 Connecting the earthing cables to the extension arm with spring arm, Dual arm, with CEMOR

(See "Figure 36")

The earthing cables are pre-assembled in the extension arm and the spring arm and must be laid and connected in the direction of the arrow.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Lay and connect the earthing cables in the direction of the arrow illustrated in the Figure, and then route them towards the interface plate if required.
3. Insert the earthing cables into the mounting aperture in the spring arm bearing support ③ and lay them above the swivel axis (revolute joint) ②.
4. Route the mounted earthing cables ① from the flange along the ceiling tube towards the interface plate.
5. Route the earthing cable ④ out of the CEMOR through the spring arm above the swivel axis (revolute joint) ② and then route it into the mounting aperture in the bearing support ③ of the spring arm.
6. Route the earthing cable ④ through the extension arm and towards the interface plate.

## 11.10 Routing the supply cables and hoses through the extension arm with spring arm, Dual arm, with CEMOR

(See "Figure 37")

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Route the supply cables ① through the spring arm above the swivel axis (revolute joint) ② and then insert them into the mounting aperture in the bearing support ③ of the spring arm:
  - Next, route the CEMOR without exerting tensile stress on the supply cable ①.
  - Make sure that the laid cables are not damaged or torn off.
3. Route the supply cables ① through the extension arm and towards the interface plate.
4. Mount the CEMOR to the pendant system as described in the Installation Instructions of the CEMOR.

Figure 36: Connecting the earthing cables to the extension arm with spring arm, Dual arm, with CEMOR

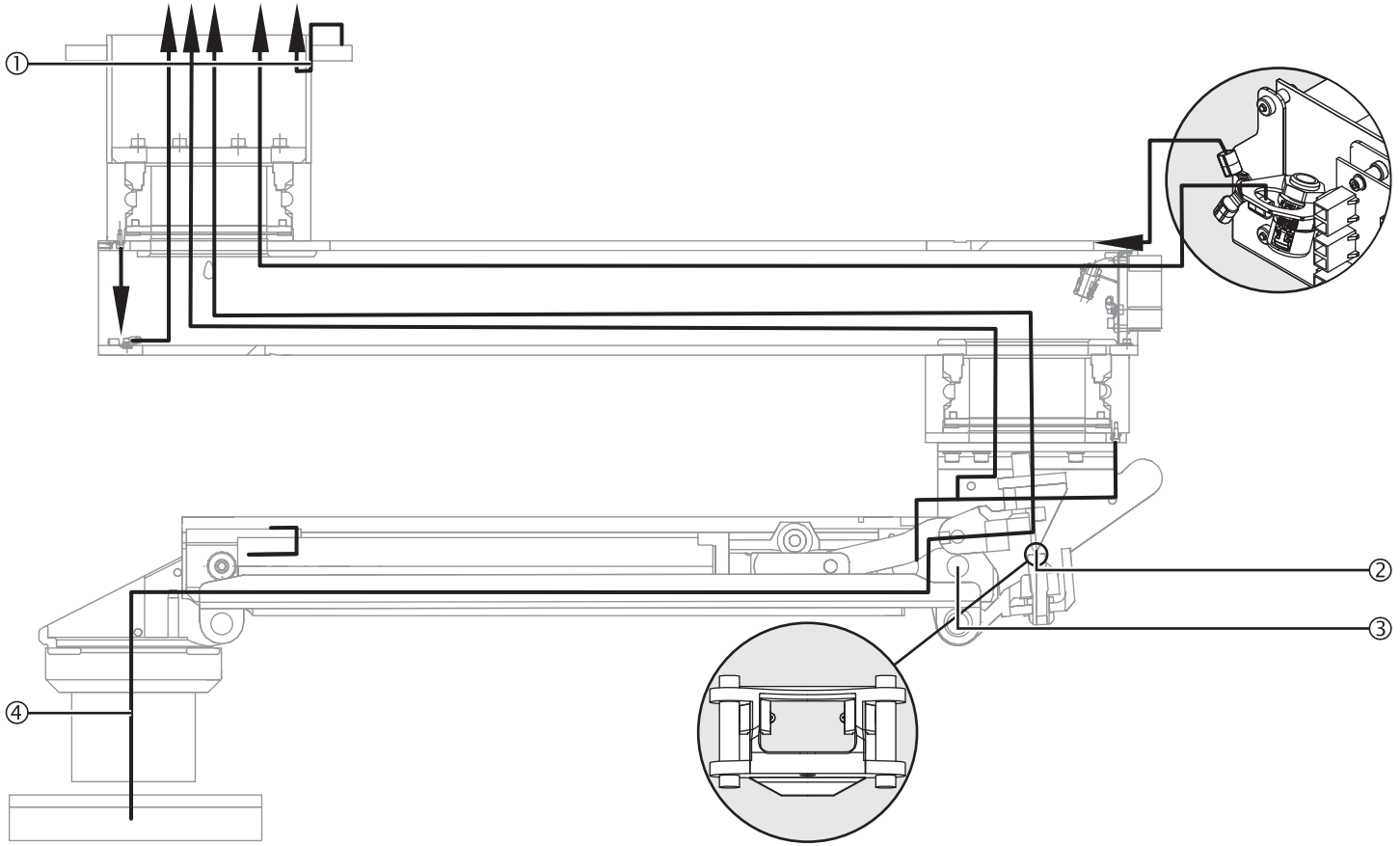
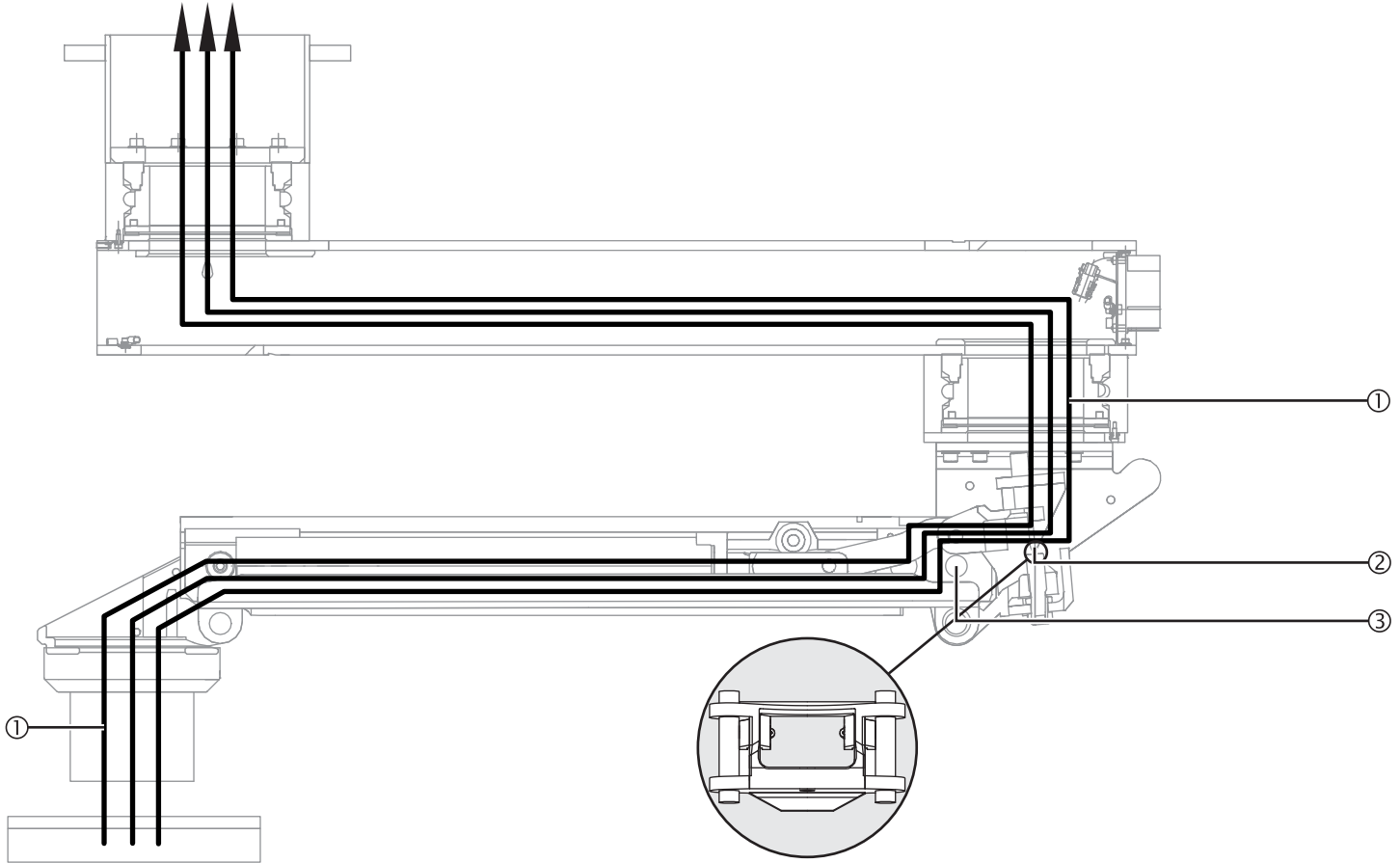


Figure 37: Routing the supply cables through the extension arm with spring arm, Dual arm, with CEMOR



## 11.11 Connecting the cables and hoses to the spring arm, Single arm, with Navigator M6

The supply cables and hoses are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the replacement of supply cables and hoses.

1. Observe the safety instructions in Chapter 11.1 on page 49.

### 11.11.1 Checking the power pack and distributor board connections

(See "Figure 38")

2. Check that the supply cables are mounted with the plugs ④/⑤ and ⑩/⑪ between the power pack ③ and the distributor board ①. If missing, mount the connecting cables included in the scope of delivery with the plugs ④/⑤ and ⑩/⑪ as illustrated in the Figure.

### 11.11.2 Connecting the electromagnetic brake

(See "Figure 38")

3. Establish the assembly connection ⑭ between the cable ⑬ and the extension cable ⑫ included in the scope of delivery as described in Chapter 7.2.2 on page 37.
4. Plug the extension cable connector ⑫ onto the corresponding distributor board socket ① as illustrated in the Figure.

### 11.11.3 Connecting the control cable of the brakes

(See "Figure 38")

5. Insert the control cable ⑩ into the mounting aperture in the spring arm bearing support ⑧ and lay it above the swivel axis (revolute joint) ⑦.
6. Route the control cable ⑩ through the strain relieving mechanism ② and plug it onto the corresponding distributor board socket ①.
7. Establish the assembly connection ⑨ between the control cable ⑨ routed out of the Navigator M6 and the control cable ⑩.

### 11.11.4 Mounting the power cable

(See "Figure 38")

8. Plug the power cable ⑥ included in the scope of delivery onto the corresponding distributor board socket ① and route it through the extension arm towards the interface plate as illustrated in the Figure.
- If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 38: Connecting the cables and hoses to the spring arm, Single arm, with Navigator M6

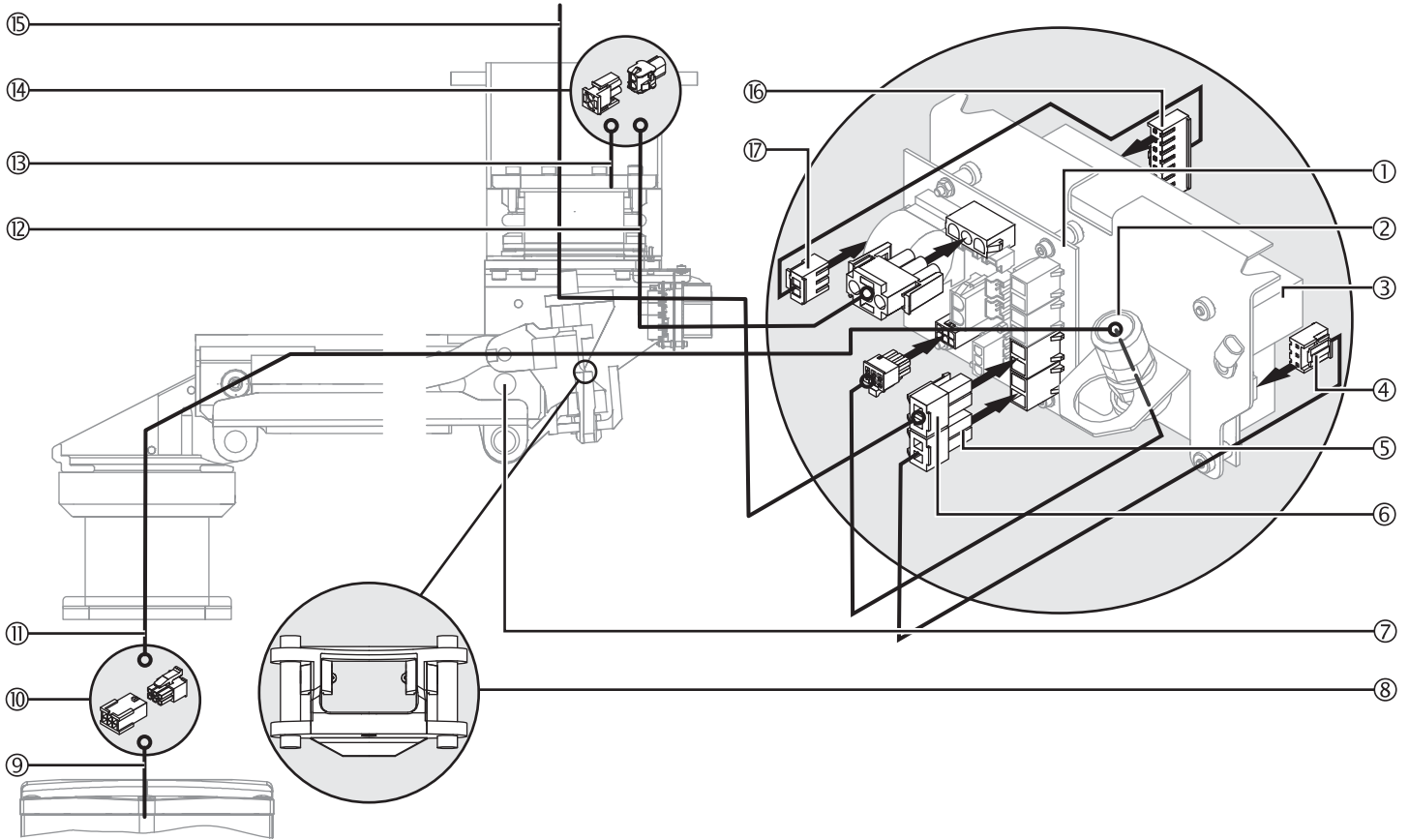


Table 06: Cable assignment: spring arm, Single arm, with Navigator M6

No. in Fig. 38	From	To	Designation	Length [mm]	Remark
⑨	Front plate Navigator M6	Drop tube	Cable interf. Navigator M6/ Navigator M6 socket	-	Integrated into the Navigator M6
⑩	Distributor board	Navigator M6	PCB/Navigator M6 socket	2600	-
⑫	Bearing point1	Distributor board	Brake cable1/PCB, 1-arm	400	-
⑬	Bearing unit	Cable ⑫, distributor board	-	100	Integrated into the bearing unit
⑮	Mains connection	Distributor board	Mains cable/PCB	5000	-

## 11.12 Connecting optional accessories to the spring arm, Single arm, with Navigator M6

1. Observe the safety instructions in Chapter 11.1 on page 49.

### 11.12.1 Connecting an optional brake indicator

(See "Figure 39")

1. Route the 2 brake indicator cables ⑦ through the spring arm and the mounting aperture ③ of the power pack ② and then plug them onto the corresponding distributor board sockets ① on the power pack ②.

### 11.12.2 Connecting an optional sound or lighting cable

(See "Figure 39")

2. Route the cable ⑥ through the spring arm above the swivel axis (revolute joint) ③ and then route it out of the mounting aperture in the bearing support ④.
3. Plug the cable connector ⑥ onto the corresponding distributor board socket ①.

Figure 39: Connecting the optional accessories to the spring arm, Single arm, with Navigator M6

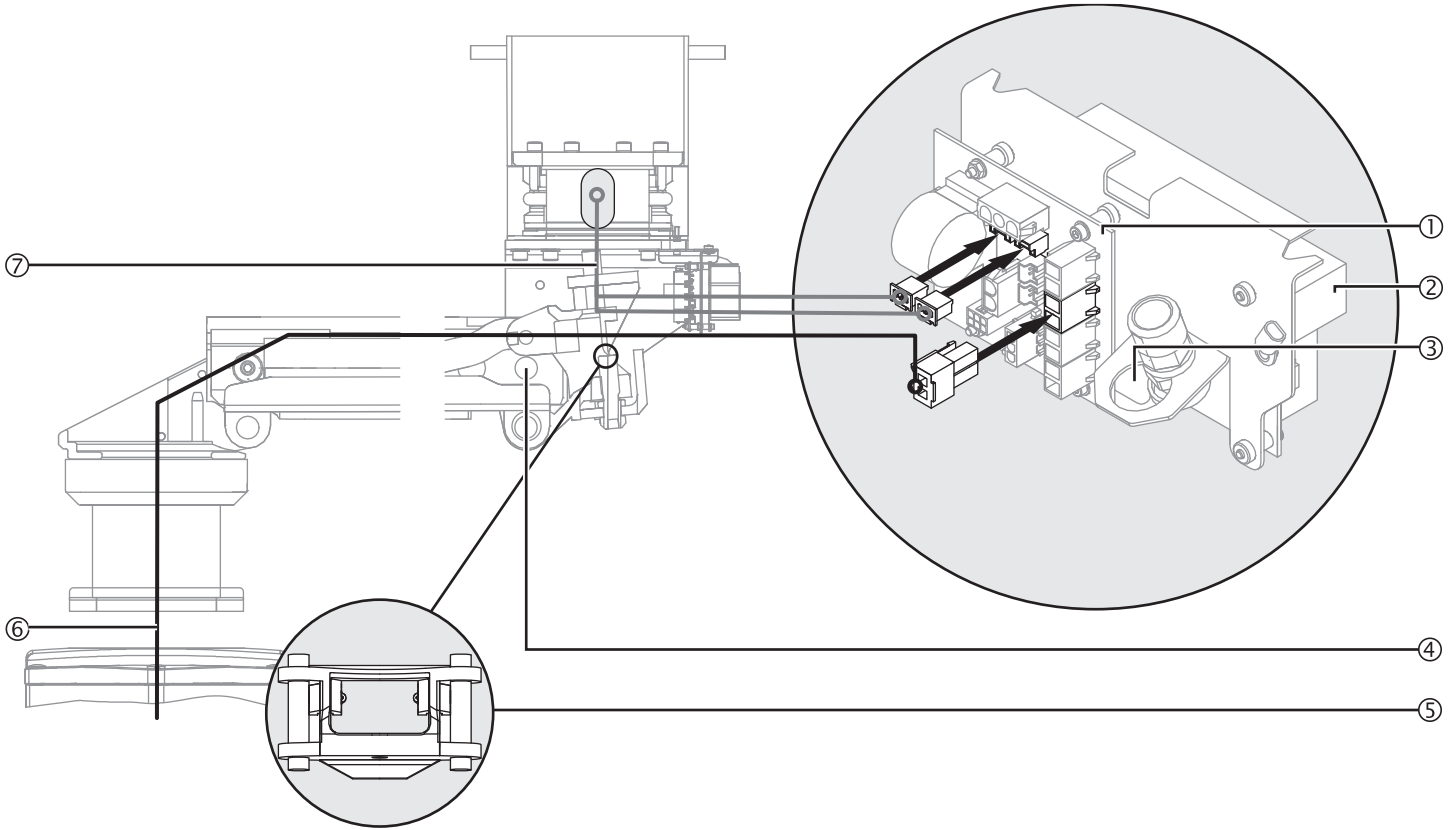


Table 07: Cable assignment: spring arm, Single arm, with Navigator M6 – optional accessories

No. in Fig. 39	From	To	Designation	Length [mm]	Remark
⑥	Navigator M6	Distributor board	Navigator M6, PCB 230V cable	3900	Integrated into the Navigator M6
⑦	Upper brake indicator	Distributor board	Brakeguide1/PCB cable	250	-

### 11.13 Connecting the earthing cables to the spring arm, Single arm, with Navigator M6

(See "Figure 40")

The earthing cables are pre-assembled in the spring arm and must be laid and connected in the direction of the arrow.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Lay and connect the earthing cables in the direction of the arrow illustrated in the Figure, and then route them towards the interface plate if required.
3. Insert the earthing cables into the mounting aperture in the spring arm bearing support ③ and lay them above the swivel axis (revolute joint) ②.
4. Route the mounted earthing cables ① from the flange along the ceiling tube towards the interface plate.
5. Route the earthing cables ④ out of the Navigator M6 through the spring arm above the swivel axis (revolute joint) ② and then route them into the mounting aperture in the bearing support ③ of the spring arm.
6. Route the earthing cables ④ towards the interface plate.

### 11.14 Routing the supply cables and hoses through the spring arm, Single arm, with Navigator M6

(See "Figure 41")

The power supply cables and gas hoses are pre-assembled in the Navigator M6. Order-specific cables, including nurse call and phone cables, must be separately routed through the pendant system.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Route the supply cables and hoses ① through the spring arm above the swivel axis (revolute joint) ② and then insert them into the mounting aperture in the bearing support ③ of the spring arm:
  - Next, route the Navigator M6 without exerting tensile stress on the supply cables and hoses ①.
  - Make sure that the laid cables are not damaged or torn off.
3. Route the supply cables and hoses ① towards the interface plate.
4. Route order-specific cables (nurse call, phone, etc.) through the pendant system.
5. Mount the Navigator M6 to the pendant system as described in the Installation Instructions of the Navigator M6.

Figure 40: Connecting the earthing cables to the spring arm, Single arm, with Navigator M6

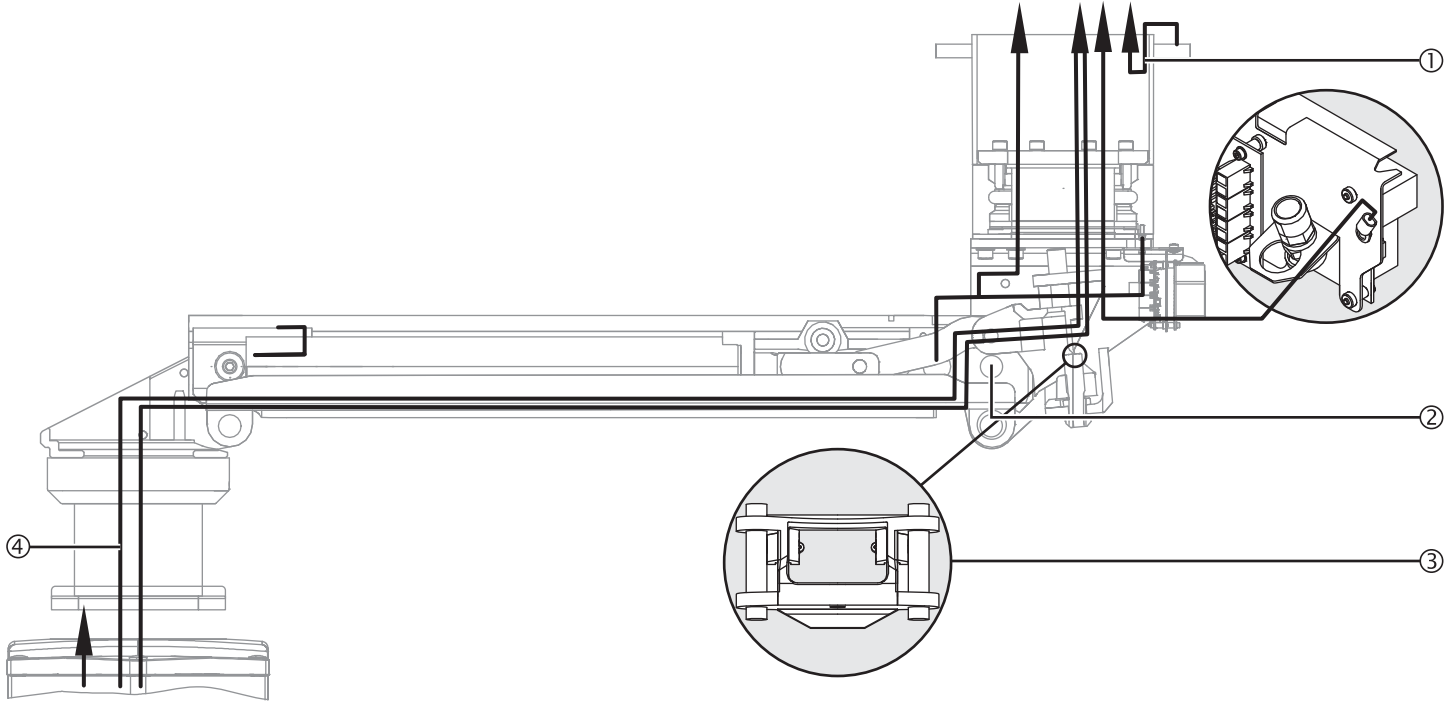
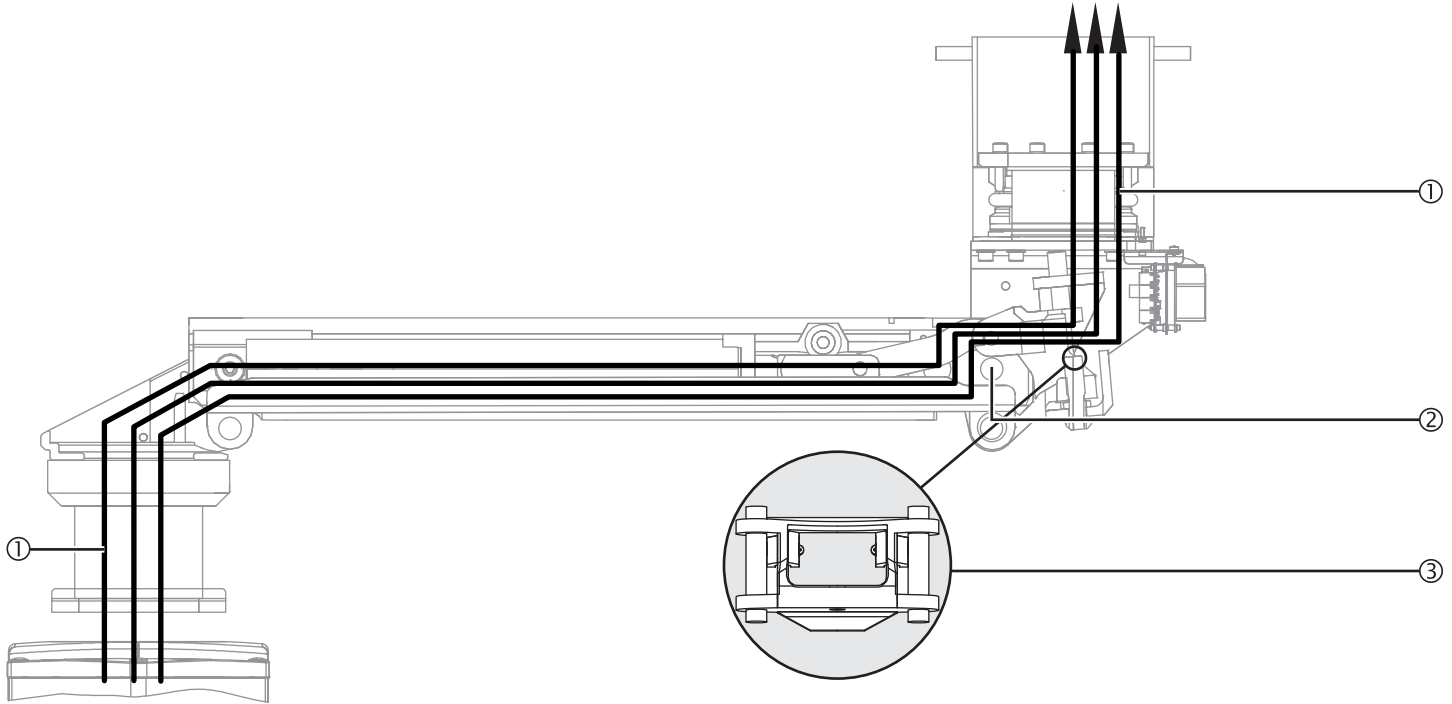


Figure 41: Routing the supply cables and hoses through the spring arm, Single arm, with Navigator M6



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## 11.15 Connecting the cables and hoses to the spring arm, Single arm, with CEMOR

(See "Figure 42")

The supply cables and hoses are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the replacement of supply cables and hoses.

1. Observe the safety instructions in Chapter 11.1 on page 49.

### 11.15.1 Checking the power pack and distributor board connections

(See "Figure 42")

2. Check that the supply cables are mounted with the plugs ④/⑤ and ⑰/⑱ between the power pack ③ and the distributor board ①. If missing, mount the connecting cables included in the scope of delivery with the plugs ④/⑤ and ⑰/⑱ as illustrated in the Figure.

### 11.15.2 Connecting the electromagnetic brake

(See "Figure 42")

3. Establish the assembly connection ⑮ between the cable ⑭ and the extension cable ⑯ included in the scope of delivery as described in Chapter 7.2.2 on page 37.
4. Plug the extension cable connector ⑮ onto the corresponding distributor board socket ① as illustrated in the Figure.

### 11.15.3 Connecting the control cable of the brakes

(See "Figure 42")

5. Insert the control cable ⑩ into the mounting aperture in the spring arm bearing support ⑧ and lay it above the swivel axis (revolute joint) ⑦.
6. Route the control cable ⑩ through the strain relieving mechanism ② and plug it onto the corresponding distributor board socket ①.
7. Establish the assembly connection ⑰ between the control cable ⑨ routed out of the Navigator M6 and the control cable ⑩.

### 11.15.4 Mounting the power cable

(See "Figure 42")

8. Plug the power cable ⑥ included in the scope of delivery onto the corresponding distributor board socket ① and route it through the extension arm as illustrated in the Figure.
  9. Route the power cable ② through the spring arm above the swivel axis (revolute joint) ⑦ and then route it out of the mounting aperture in the bearing support ⑧. Route the power supply cable ② towards the interface plate.
- If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 42: Connecting the cables and hoses to the spring arm, Single arm, with CEMOR

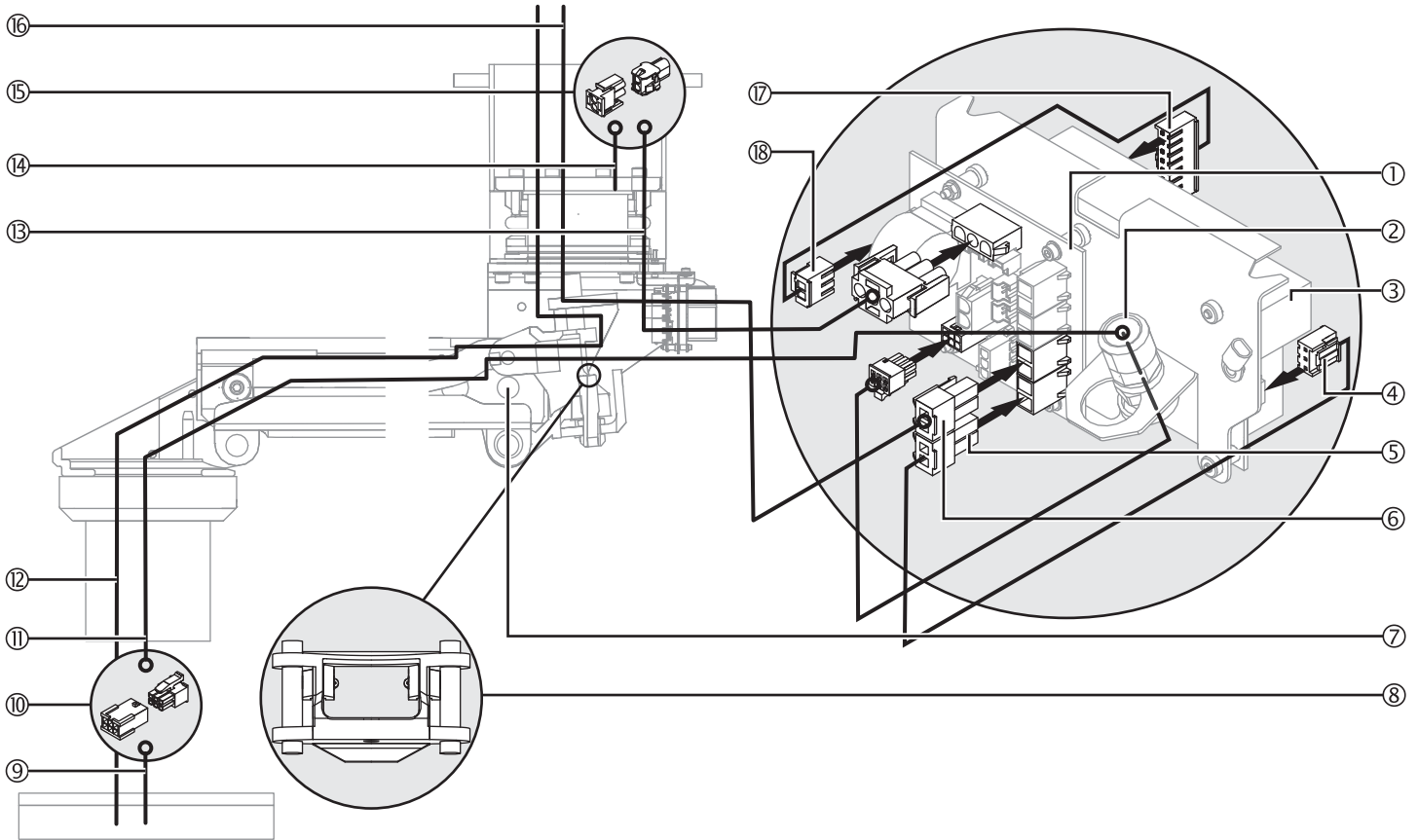


Table 08: Cable assignment: spring arm, Single arm, with CEMOR

No. in Fig. 42	From	To	Designation	Length [mm]	Remark
⑨	Front plate CEMOR	Drop tube	Cable interf. CEMOR/ socket CEMOR	-	Integrated into the CEMOR
⑩	Distributor board	CEMOR	Cable PCB/CEMOR	2600	-
⑫	Mains connection	CEMOR	-	-	-
⑬	Bearing point1	Distributor board	Brake cable1/PCB, 1-arm	400	-
⑭	Bearing unit	Cable ⑬, distributor board	-	100	Integrated into the bearing unit
⑯	Mains connection	Distributor board	Mains cable/PCB	5000	-

## 11.16 Connecting the optional accessories to the spring arm, Single arm, with CEMOR

(See "Figure 43")

1. Observe the safety instructions in Chapter 11.2 on page 49.

### 11.16.1 Connecting the optional brake indicators

(See "Figure 43")

2. Route the 2 brake indicator cables④ through the spring arm and the mounting aperture③ of the power pack② and then plug them onto the corresponding distributor board sockets① on the power pack②.

Figure 43: Connecting the optional accessories to the spring arm, Single arm, with CEMOR

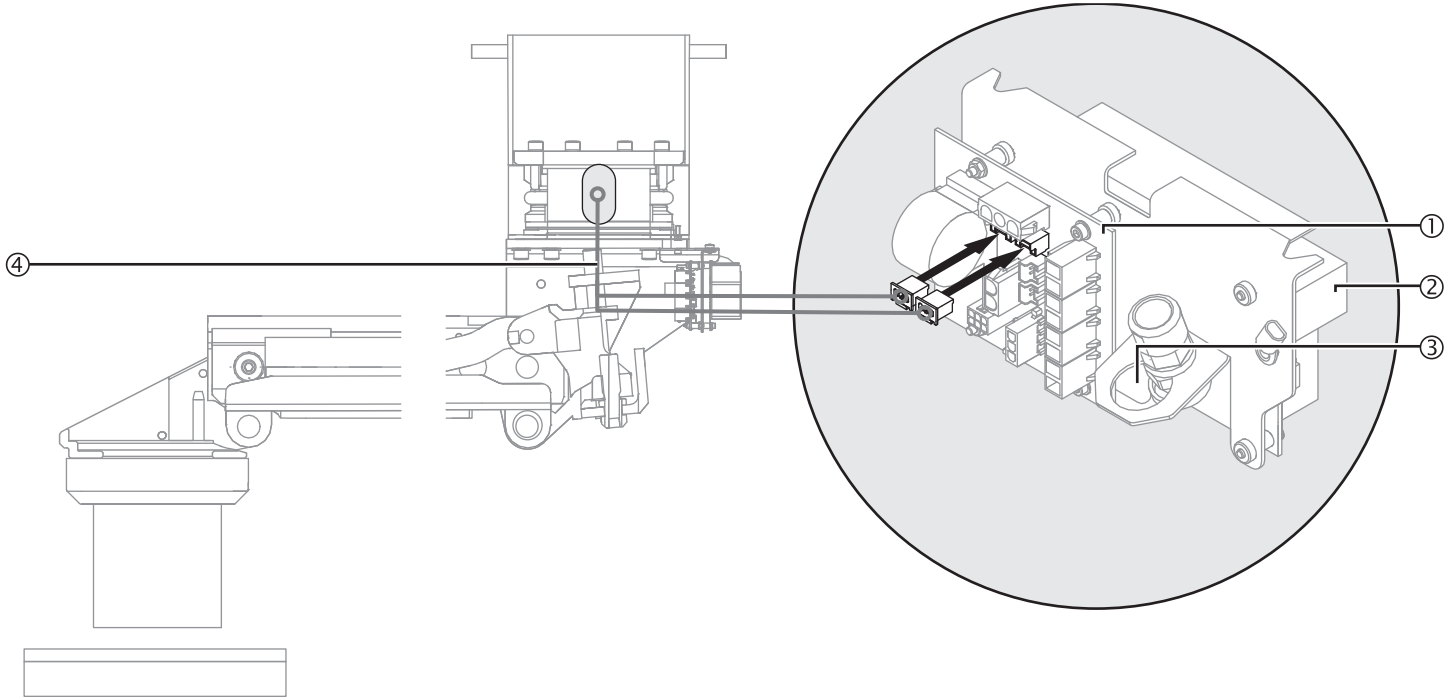


Table 09: Cable assignment: spring arm, Single arm, with CEMOR – optional accessories

No. in Fig. 43	From	To	Designation	Length [mm]	Remark
④	Brake indicator	Distributor board	Brakeguide1/PCB cable	250	-

### 11.17 Connecting the earthing cables to the spring arm, Single arm, with CEMOR

(See "Figure 44")

The earthing cables are pre-assembled in the spring arm and must be laid and connected in the direction of the arrow.

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Lay and connect the earthing cables in the direction of the arrow illustrated in the Figure, and then route them towards the interface plate if required.
3. Insert the earthing cables into the mounting aperture in the spring arm bearing support③ and lay them above the swivel axis (revolute joint)② .
4. Route the mounted earthing cables ① from the flange along the ceiling tube towards the interface plate.
5. Route the earthing cable ④ out of the CEMOR through the spring arm above the swivel axis (revolute joint)② and then route them into the mounting aperture in the bearing support③ of the spring arm.
6. Route the earthing cable ④ towards the interface plate.

### 11.18 Routing the supply cables and hoses through the spring arm, Single arm, with CEMOR

(See "Figure 45")

1. Observe the safety instructions in Chapter 11.1 on page 49.
2. Route the supply cables ① through the spring arm above the swivel axis (revolute joint)② and then insert them into the mounting aperture in the bearing support③ of the spring arm:
  - Next, route the CEMOR without exerting tensile stress on the supply cable ① .
  - Make sure that the laid cables are not damaged or torn off.
3. Route the supply cables ① towards the interface plate.
4. Mount the CEMOR to the pendant system as described in the Installation Instructions of the CEMOR.

Figure 44: Connecting the earthing cables to the spring arm, Single arm, with CEMOR

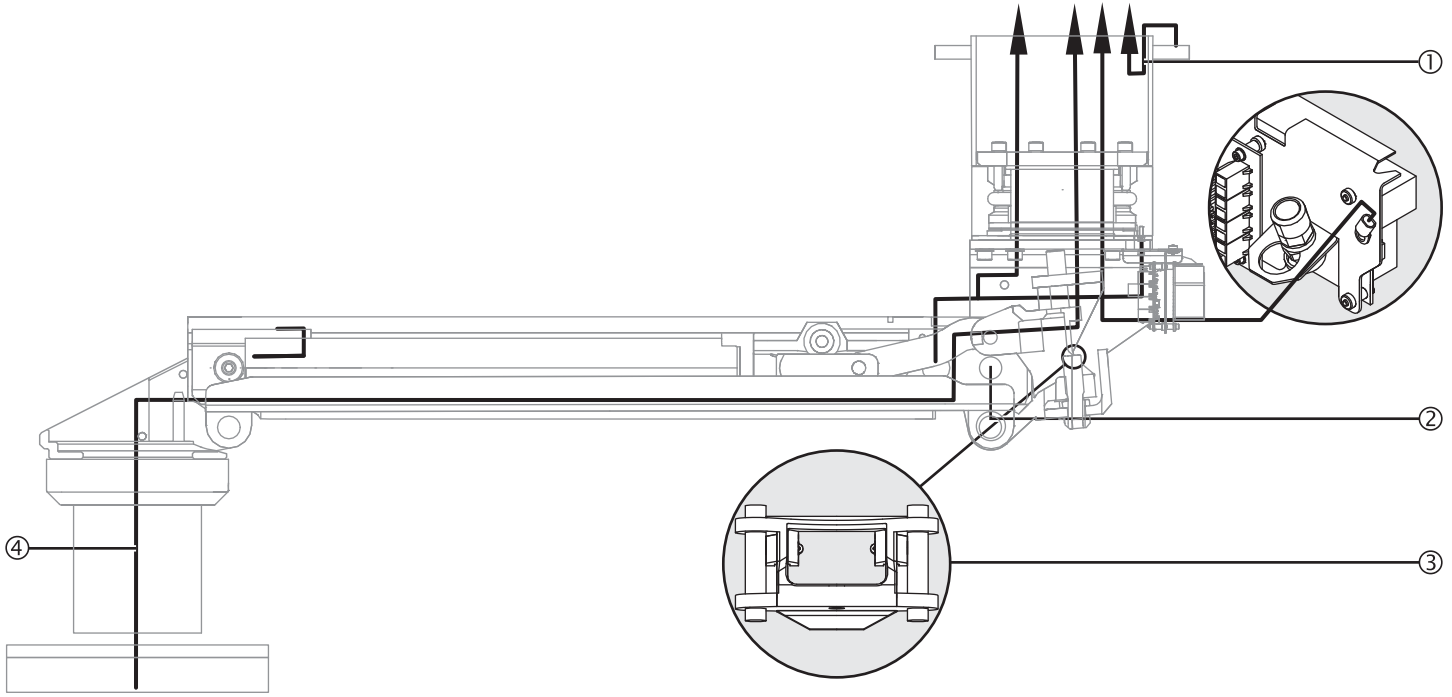
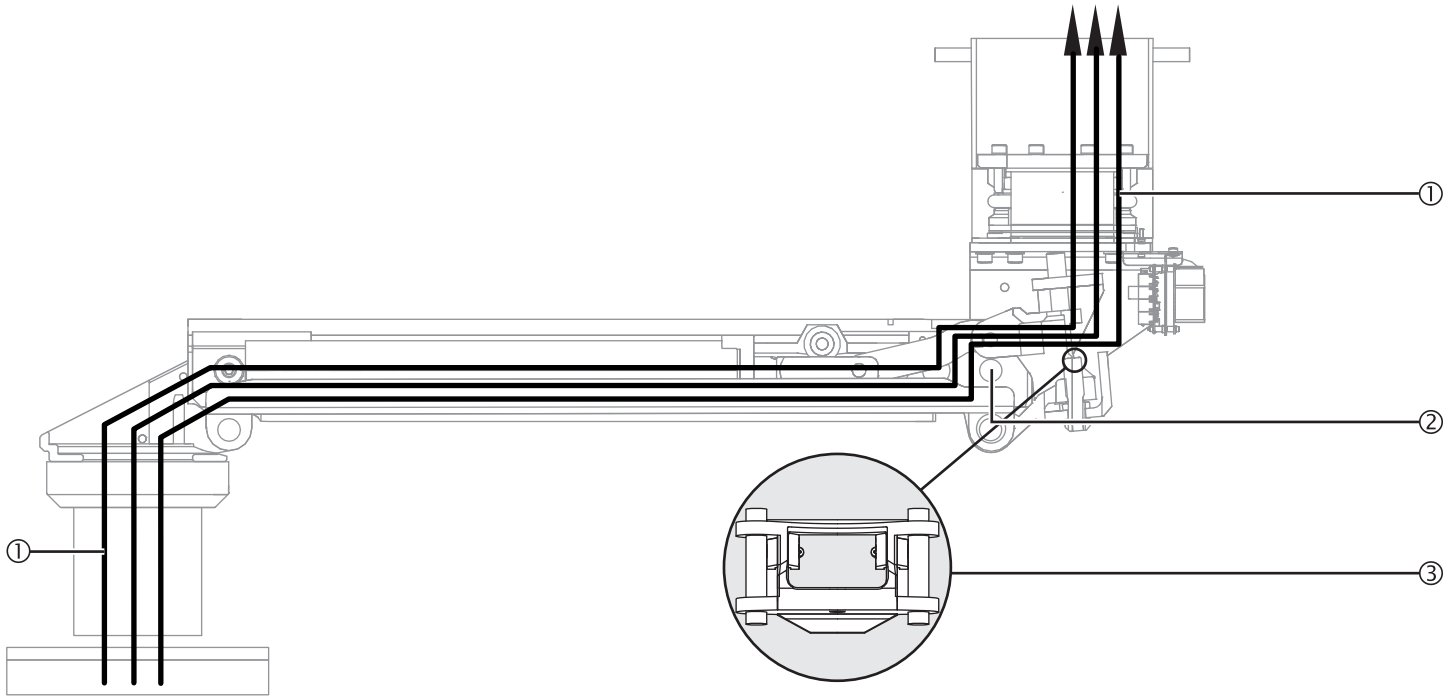


Figure 45: Routing the supply cables and hoses through the spring arm, Single arm, with CEMOR



## 12.1 Safety instructions

### WARNING

#### Qualification of installation personnel

**The electrical connection of the pendant system and the CEMOR or the Navigator M6 may only be performed by a qualified electrician:**

- Observe the safety instructions set out in the Installation Instructions Part 1 – Ceiling Mount, Chapter "Power Supply".

**The gas supply connection of the Navigator M6 may only be performed by the supplier of the central gas system:**

- The supplier of the central gas supply system is responsible for carrying out leak tightness, pressure, flow, contamination and gas type tests.



#### Electric shock hazard

**Contact with energised components presents a danger to life from electric shock. Motor-driven, mobile device components can cause injury in the case of being switched on unintentionally. Prior to any installation and setting up work, the appliance must be disconnected from the mains:**

- Disconnect all poles of the power supply source / appliance from the mains and prevent it from being reconnected accidentally.
- Check whether the appliance is de-energised.
- Earth and short-circuit the appliance.
- Cover and shield any adjacent energised parts.

#### Electric shock hazard through defective insulation

**The pendant system, the CEMOR or the Navigator M6 can be energised if the insulation is defective:**

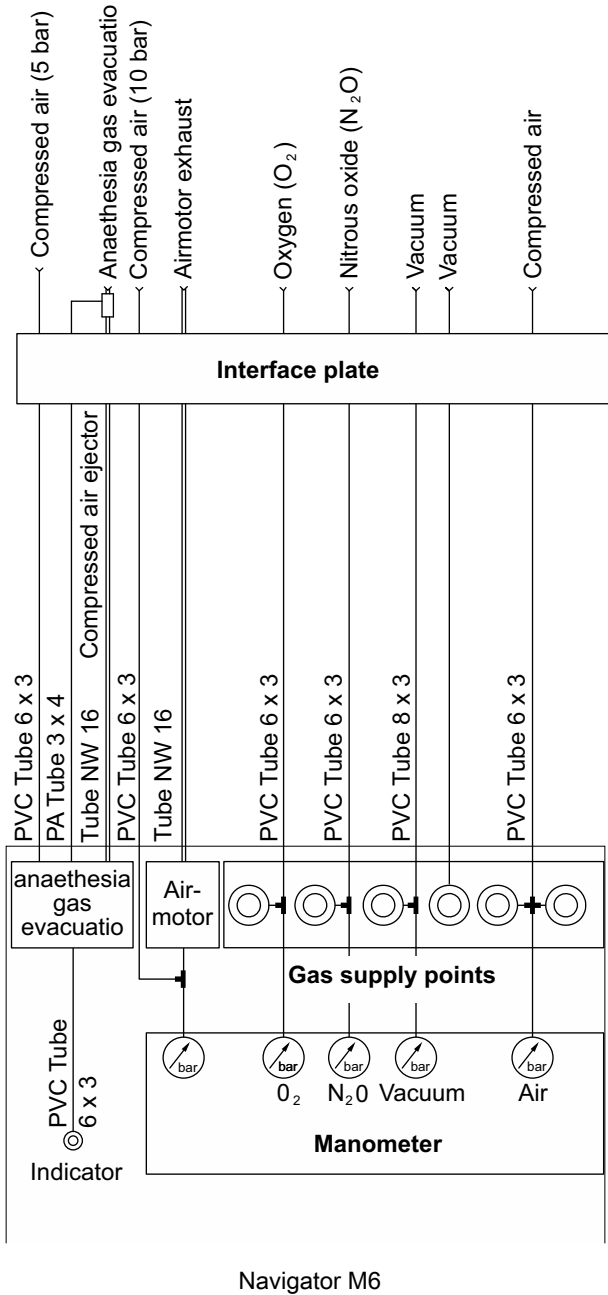
- Make sure you always earth the pendant system and the CEMOR or the Navigator M6.
- The power supply and earthing cables must be connected to the strain relieving mechanisms of the interface plate.

#### Damaged power cables, gas hoses and compressed air hoses

**Damaged power cables can carry an electric voltage of 230V (120V) which energises the pendant system, and supply gases can escape from damaged supply hoses:**

- Check all cables and hoses for damage. Make sure you carefully insert them without cables/hoses crossing each other, without loops and without twisting.
- Lay the cables and hoses in the extension arm and spring arm in such a way that they are not exposed to tensile stress in any position.
- Cables and hoses must be routed straight upwards out of the flange in order in order to prevent damage (e.g. rubbing of the sheathing) and enable their free rotation.
- Protruding cables and hoses must not be placed in the CEMOR or the Navigator M6 on the flanges, but must be placed on the interface plate and secured against falling using cable retainers.
- Electric cables must be laid in accordance with regional regulations (in a spiral coiled tube if required).

Figure 46: Installing gas supply and exhaust air ducts



## 12.2 Installing gas supply and exhaust air ducts

(See "Figure 46")

1. Observe the safety instructions in Chapter 12.1 on page 74.

### NOTE – Make sure that the gas types are correctly assigned

- The gas type is indicated on a label attached to the gas supply pipes equipped with sealing plugs.
- The sealing plugs may only be removed during installation.
- Check the pipes and ducts for contamination and clean them with oil-free air.

The illustration shows the example of a gas supply pipe. Make sure that the cables and ducts are assigned to the correct supply outlet points.

1. Check the gas supply pipes for contamination and clean them with oil-free air.
2. Fit a hose clamp to the gas supply pipe, remove the sealing plug and push the pipe onto the correct gas supply outlet point.
  - Up to 3 gas supply hoses and up to 2 vacuum hoses may be connected to a gas valve using Y connectors.
3. Press on the hose clamp and check that it is securely in place.
4. Connect and secure the anaesthetic gas suction hoses and the air motor exhaust air hoses.
5. Perform a gas type test as described in Chapter 13.1 on page 77.

Figure 47: Connecting the earthing cables

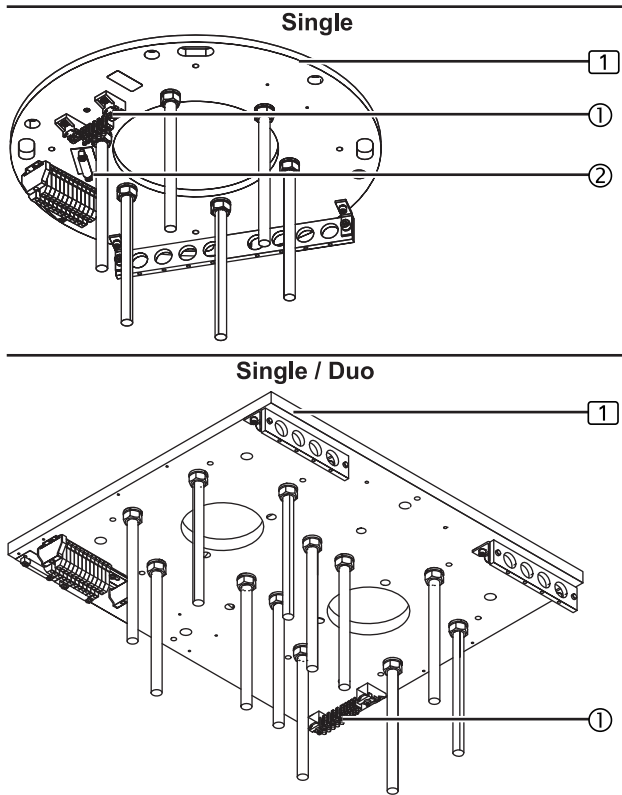
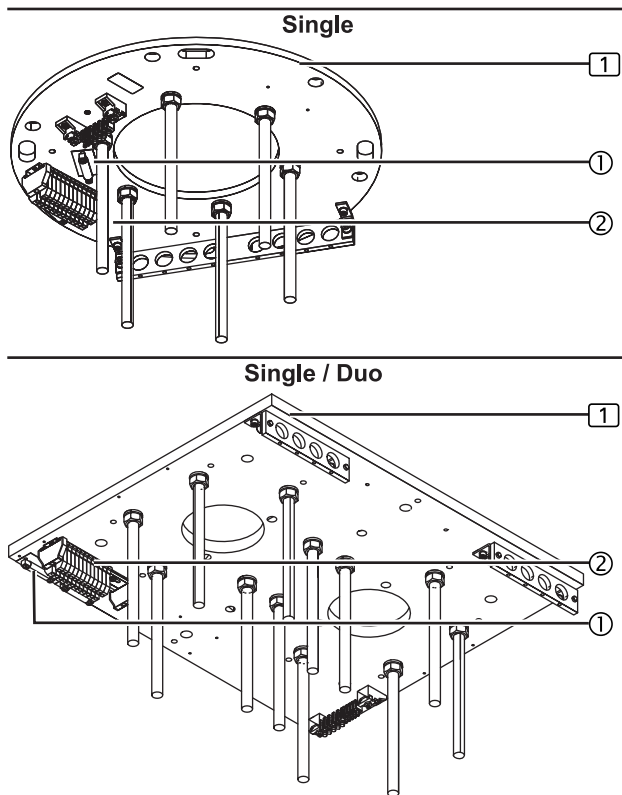


Figure 48: Connecting power cables



### 12.3 Connecting the earthing cables

(See "Figure 47")

The Figure shows a simplified illustration of the interface plate 1 without extension arm and cables, etc.

1. Observe the safety instructions in Chapter 12.1 on page 74.
2. Cut all green/yellow earthing cables (2.5mm<sup>2</sup> and 10mm<sup>2</sup>) to the correct length.
3. Route the earthing cables through the strain relieving mechanism and connect them to the series terminals 4mm<sup>2</sup> or 10mm<sup>2</sup> on the earthing terminal block 1 on the interface plate 1.
4. Check that the earthing cables are securely in place in the strain relieving mechanisms 2:
  - All earthing cables must be securely installed in the strain relieving mechanisms 2.

### 12.4 Connecting power cables

(See "Figure 48")

The Figure shows a simplified illustration of the interface plate 1 without extension arm and cables, etc.

1. Observe the safety instructions in Chapter 12.1 on page 74.
2. Route all power cables through the strain relieving mechanism 1 and connect them to the terminal block 2 as illustrated in the wiring diagram provided at the installation site.
3. Check that the power cables are securely in place in the strain relieving mechanisms 1:
  - All power cables must be securely installed in the strain relieving mechanisms 1.

#### NOTE – Connection to separate electric circuit required

- If the electromagnetic brake is overcharged, the power pack can switch off to prevent being overheated. To place it back into operation the pendant system must be disconnected from the mains.
- For this reason the power supply cables 230V/120V of the power pack must be connected to a separately switchable electric circuit.
- A fuse or a miniature circuit breaker (up to 6 Ampere) must be provided for the cable connection to the Navigator Lift™ 180 pendant system.

### 12.5 Checking the supply cables and hoses

Carefully check that the supply cables and hoses are not trapped or bent across the entire rotating motion of the extension arm and spring arm.

### 13.1 Gas inspection (only Navigator M6)

1. Gas outlets and marking according to DIN EN ISO 9170-1 or DIN EN ISO 9170-2
2. Leakage, in accordance with DIN EN ISO 11197
3. Congestion, in accordance with DIN EN ISO 7396-1 or DIN EN ISO 7396-2
4. Solid contamination, in accordance with DIN EN ISO 7396-1 or DIN EN ISO 7396-2
5. Gas type, in accordance with DIN EN ISO 7396-1 or DIN EN ISO 7396-2

### 13.2 Mechanical collision test

When swivelling the pendant system, check that no collisions can occur with:

- other pendant systems,
- ceilings or walls,
- other assembly units.

Figure 49: Preparing the installation of the canopy

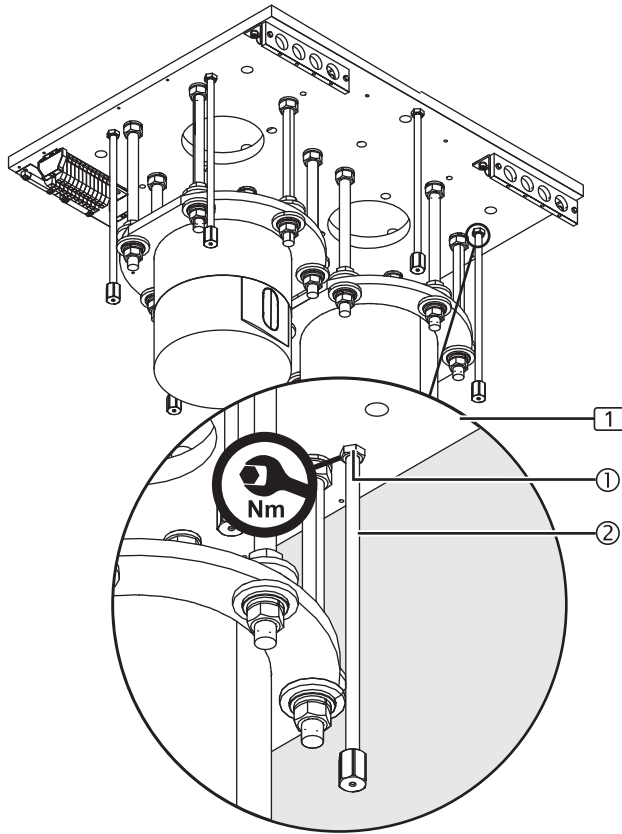
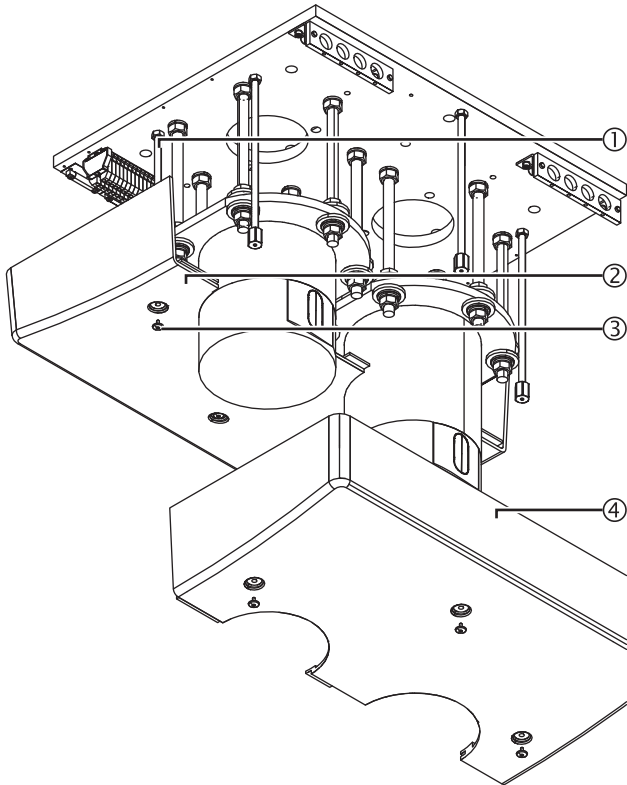


Figure 50: Mounting the canopy halves



## 14.1 Mounting a Single / Duo canopy

### 14.1.1 Preparing the installation of the canopy

(See "Figure 49")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or spring arm.

1. Screw the hexagonal nuts M10 ① onto the threaded bolts M10 x 360mm ②.
2. Screw the threaded bolts M10 x 360mm ② into the interface plate ① in such a way that the canopy halves mounted afterwards are flush with the intermediate ceiling / prefabricated ceiling.
  - If an interface plate ① is mounted to the raw ceiling, the threaded bolts M10 x 360mm ② must be cut to length accordingly.

#### ⚠ WARNING



#### Risk of the canopy dropping

The canopy can drop if the fixing elements have not been properly tightened:

- Tighten the 4 hexagonal nuts M10 ① to 46Nm.

3. Check that the threaded bolts M10 x 360mm ② are securely in place:
  - The threaded bolts M10 x 360mm ② must be mounted at the same distance to the interface plate ①.
  - The 4 hexagonal nuts M10 ① must be tightened to 46Nm.

### 14.1.2 Mounting the canopy halves

(See "Figure 50")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or spring arm.

1. Place the sectional strip (not illustrated in the Figure) onto the first canopy half ② (the canopy can be optionally sealed with silicone).
2. Place the first canopy half ② onto the threaded bolts M10 x 360mm ① and then screw in and tighten the 3 cover screws ③.
3. Check that the canopy half ② is flush with the intermediate ceiling / prefabricated ceiling.
  - If required, readjust the 6 threaded bolts M10 x 360mm ① as described in Chapter 14.1.1 on page 78.
4. Place the sectional strip (not illustrated in the Figure) onto the second canopy half ④ and push it into the first canopy half ② in such a way that they engage tightly with each other.
5. Place the second canopy half ④ onto the threaded bolts M10 x 360mm ① and then screw in and tighten the 3 cover screws ③.
6. Check that the canopy halves ② / ④ are securely in place:
  - The canopy halves ② / ④ must engage tightly with each other.
  - The canopy must be fully flush with the intermediate ceiling / prefabricated ceiling.
  - The 6 cover screws ③ must be tightened.

Figure 51: Preparing the installation of the canopy

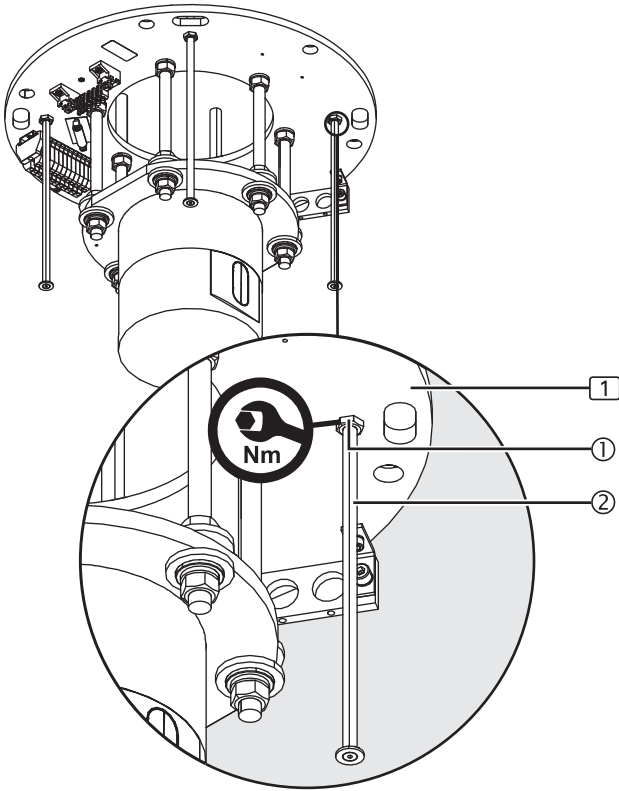
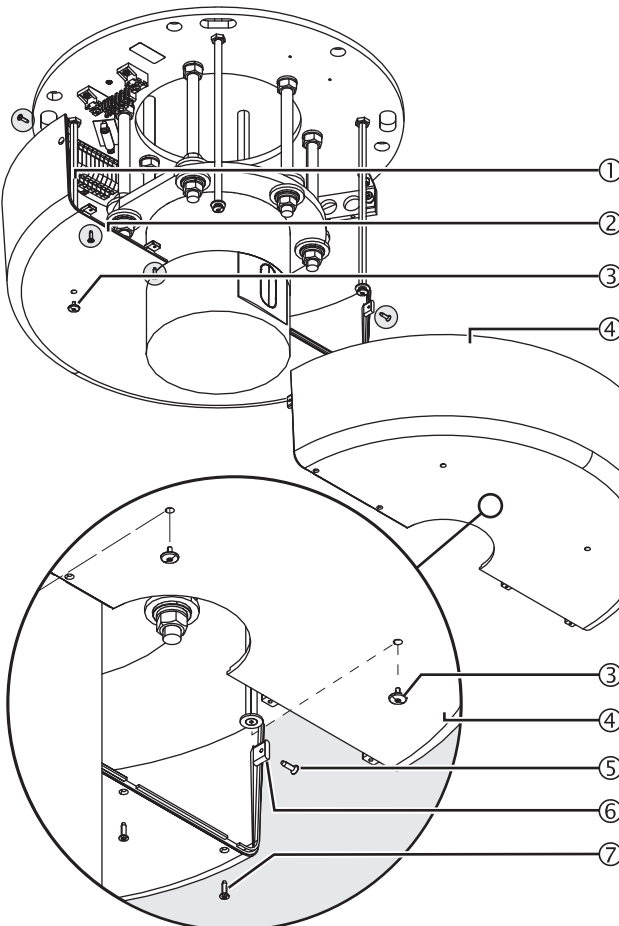


Figure 52: Mounting the canopy halves



## 14.2 Mounting the Single canopy

### 14.2.1 Preparing the installation of the canopy

(See "Figure 51")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or spring arm.

1. Screw the hexagonal nuts M10 ① onto the threaded bolts M10 x 360mm ② .
2. Screw the threaded bolts M10 x 360mm ② into the interface plate ① in such a way that the canopy halves mounted afterwards are flush with the intermediate ceiling / prefabricated ceiling (see "Figure 15: on page 34").
- If an interface plate ① is mounted to the raw ceiling, the threaded bolts M10 x 360mm ② must be cut to length accordingly.

### ⚠ WARNING



#### Risk of the canopy dropping

**The canopy can drop if the fixing elements have not been properly tightened:**

- Tighten the 4 hexagonal nuts M10 ① to 46Nm.
3. Check that the threaded bolts M10 x 360mm ② are securely in place:
    - The threaded bolts M10 x 360mm ② must be mounted at the same distance to the interface plate ①.
    - The 4 hexagonal nuts M10 ① must be tightened to 46Nm.

### 14.2.2 Mounting the canopy halves

(See "Figure 52")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or spring arm.

1. Place the sectional strip (not illustrated in the Figure) onto the first canopy half ② (the canopy can be optionally sealed with silicone).
2. Place the first canopy half ② onto the threaded bolts M10 x 360mm ① and then screw in and tighten the 2 cover screws ③ .
3. Check that the canopy half ② is flush with the intermediate ceiling / prefabricated ceiling.
  - If required, readjust the 4 threaded bolts M10 x 360mm as described in Chapter 14.2.1 on page 79.
4. Place the sectional strip (not illustrated in the Figure) onto the second canopy half ④ and push it into the first canopy half ② in such a way that they engage tightly with each other.
5. Place the second canopy half ④ onto the threaded bolts M10 x 360mm ① and then screw in and tighten the 2 cover screws ③ .
6. Screw 1 sheet metal screw each ⑤ into the 2 straps ⑥ on the opposite outer faces of the canopy halves ② / ④ .
7. Screw in and tighten 4 sheet metal screws each ⑦ to the bottom ends of the canopy halves ② / ④ .
8. Check that the canopy halves ① are securely in place:
  - The canopy halves ② / ④ must engage tightly with each other.
  - The canopy must be fully flush with the intermediate ceiling / prefabricated ceiling.
  - All fixing screws ③ / ⑤ / ⑦ must be tightened.

Figure 53: Mounting the cover caps

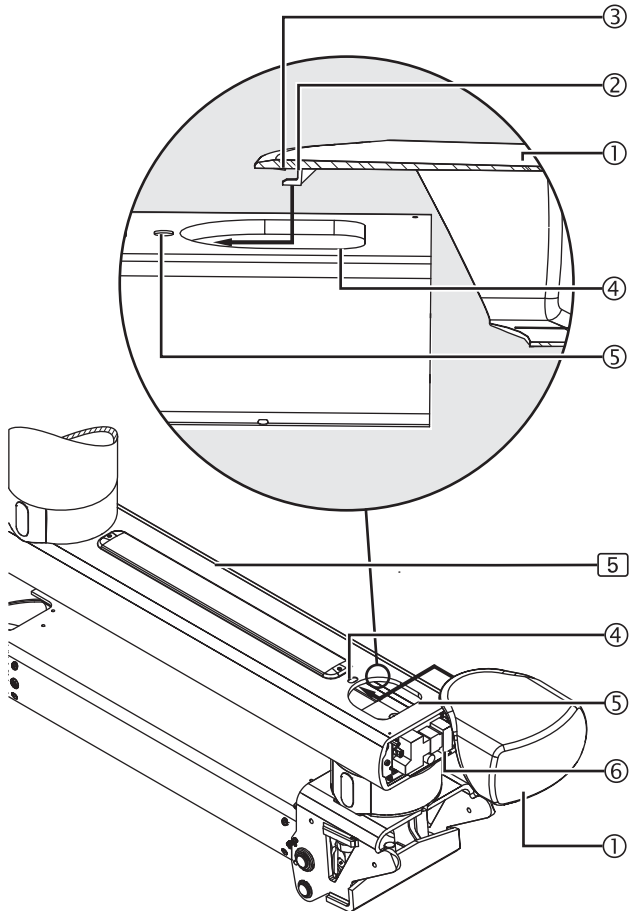
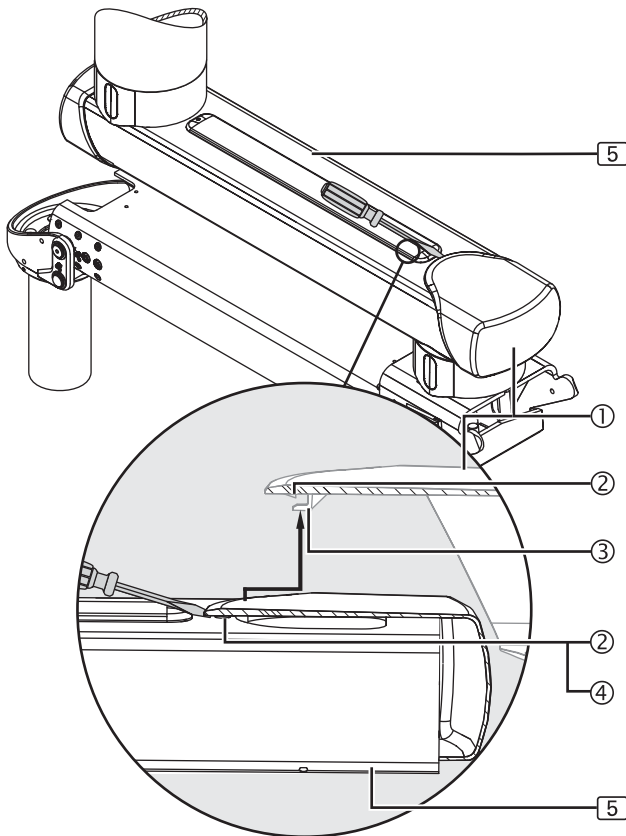


Figure 54: Dismantling the cover caps



### 14.3 Mounting/dismantling the cover caps to/from the extension arm

#### 14.3.1 Mounting the cover caps

(See "Figure 53")

The Figure shows the extension arm with spring arm [5]. The installation procedure for the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified representation with only the extension arm with spring arm [5] or the XL extension arm with spring arm [5] without cables. The detailed representation shows a sectional view of the cover cap ①.

1. When placing the cover cap ① onto the extension arm end, make sure that the holding down clamp ② sits in the aperture ④.
2. Push the cover cap ① onto the extension arm with spring arm [5] or the XL extension arm with spring arm [5] as far as it will go and make sure that the latch ③ snaps into place in the groove ⑤:
  - Make sure that the power pack ⑥ and the cables in the extension arm with spring arm [5] or the XL extension arm with spring arm [5] are not damaged.
  - If properly mounted, the cover cap ① can no longer be withdrawn from the extension arm with spring arm [5] or the XL extension arm with spring arm [5].
3. Check that the cover cap ① is securely in place:
  - The cover cap ① muss be absolutely level with the contours of the extension arm with spring arm [5] or the XL extension arm with spring arm [5].

#### 14.3.2 Dismantling the cover caps

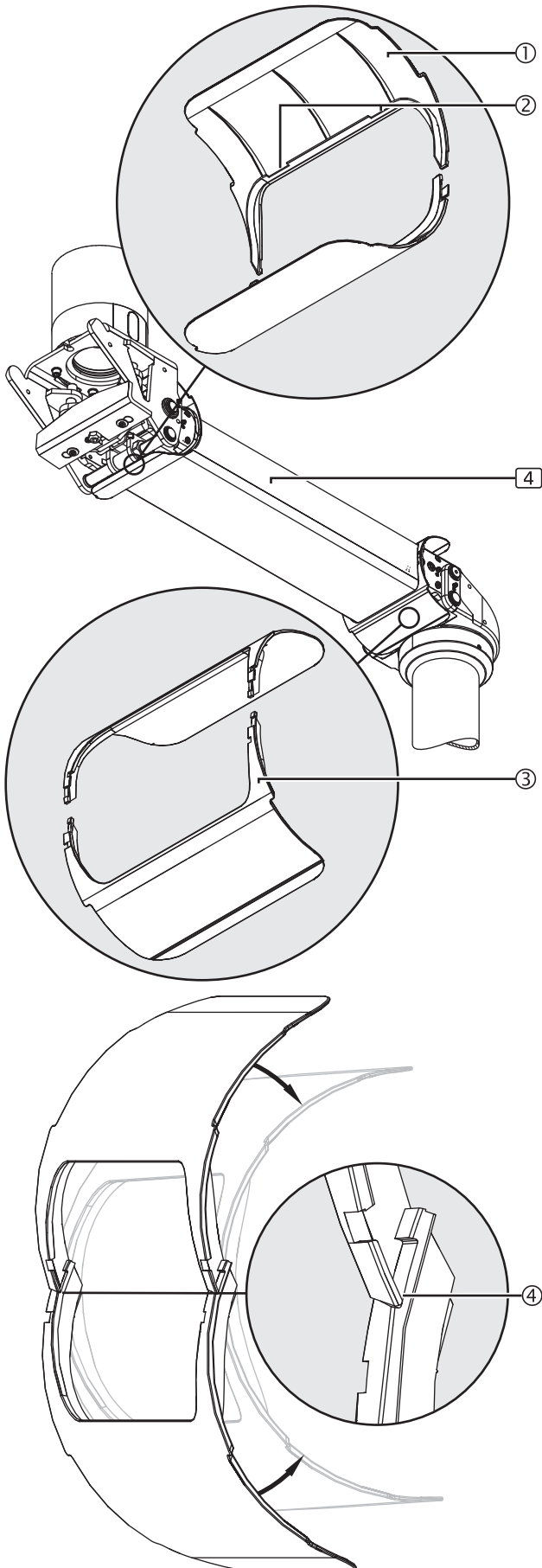
(See "Figure 54")

The Figure shows the extension arm with spring arm [5]. The installation procedure for the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified representation with only the extension arm with spring arm [5] or the XL extension arm with spring arm [5] without cables. The detailed representation shows a sectional view of the cover cap ①.

1. To dismantle the cover cap ① push a small, flat screwdriver between the cover cap ① and the extension arm with spring arm [5] or the XL extension arm with spring arm [5] and gently push the latch ② out of the groove ④.
  - Make sure you do not damage the latch ②.
  - Make sure that the cover cap ① neither breaks nor bends.
2. Pull the cover cap ① backwards until the holding down clamp ③ no longer engages and the cover cap ① can be freely moved.
  - Do not twist the cover cap ① and do not remove it with force.
3. Remove the cover cap ① towards the top and keep it in a safe place.

Figure 55: Mounting the cover plates to the spring arm



## 14.4 Mounting the cover plates to the spring arm

(See "Figure 55")

The Figure shows the spring arm [4]. The installation procedure for the extension arm with spring arm [5] or the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified illustration of the spring arm [4] without cables and without control board.

### 14.4.1 Inserting the rear cover plates

1. Place the 2 rear cover plate halves ① (see the 2 cutouts ②) around the spring arm.
2. To make sure that the cover plate halves securely snap into place, put them inside each other in the correct position ④ illustrated in the Figure and then stick them together in the direction of the arrow.
  - à The cover plate halves engage with each other and are connected.
3. Check that the cover plate halves ① are securely in place:
  - All the latches on the cover plate halves ① must be securely engaged with each other.

### 14.4.2 Inserting the front cover plates

4. Repeat procedure for the 2 front cover plate halves ③.

Figure 56: Mounting the rear side panels to the spring arm

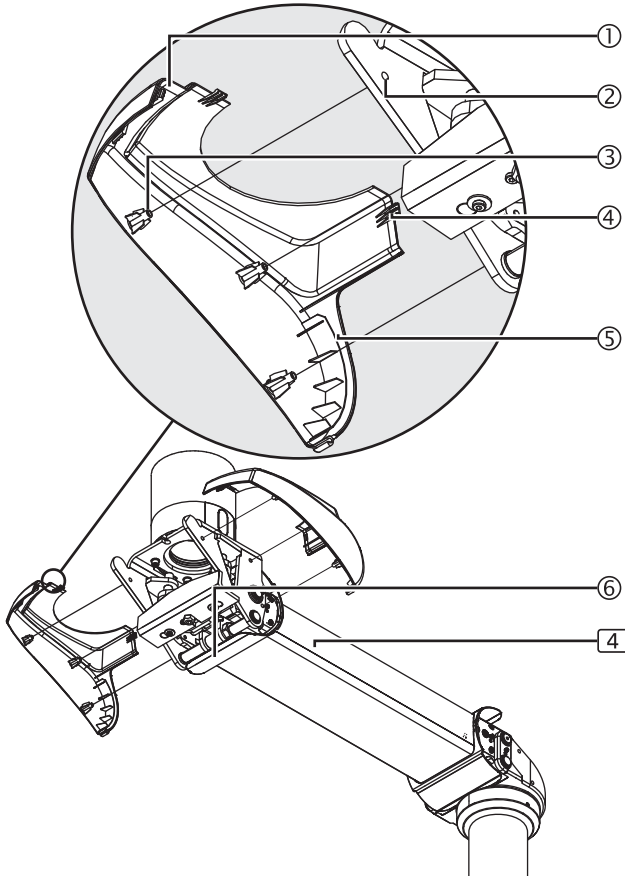
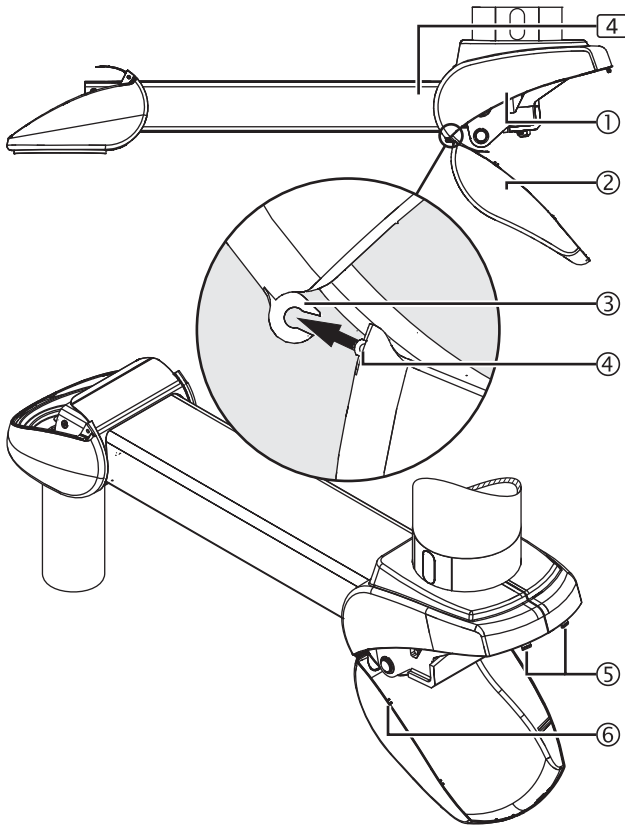


Figure 57: Mounting the lower, rear covers to the spring arm



### 14.5 Mounting the rear side panels to the spring arm

(See "Figure 56")

The Figure shows the spring arm [4]. The installation procedure for the extension arm with spring arm [5] or the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified illustration of the spring arm [4] without cables and without control board.

1. Place the first side cover panel ① and insert 3 plastic pins ③ into the holes ② in the spring arm.
  - Make sure that the cover plate ⑥ protrudes into the guide ⑤ of the side cover panel ①.
2. Place the second side cover panel and insert 3 plastic pins ③ into the holes ② in the spring arm.
  - The cover plate ⑥ must protrude into the guide ⑤ of the side cover panel ① and the locking devices ④ on the 2 side cover panels must engage with each other.
3. Check that the side cover panels are securely in place:
  - The locking devices ④ must be connected with each other.
  - The cover plate ⑥ must slide in the guides ⑤ of the side cover panels.
  - The side cover panels must engage tightly with each other without gaps.

### 14.6 Mounting the lower, rear covers to the spring arm

(See "Figure 57")

The Figure shows the spring arm [4]. The installation procedure for the extension arm with spring arm [5] or the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified illustration of the spring arm [4] without cables and without control board.

1. Hold the cover ② in the angle illustrated in the Figure.
2. Insert the joint ④ of the rear, lower cover ② into the 2 mounting fixtures ③ in the upper side cover panels ①.
3. Fold up the cover ② such that the 2 latches ⑤ snap into place.
4. Check that the cover ② is securely in place:
  - The guides ⑥ of the cover ② must sit in the side cover panels ①.
  - The cover ② must sit in the side cover panels ① without gaps.

Figure 58: Mounting the front side cover panels to the spring arm

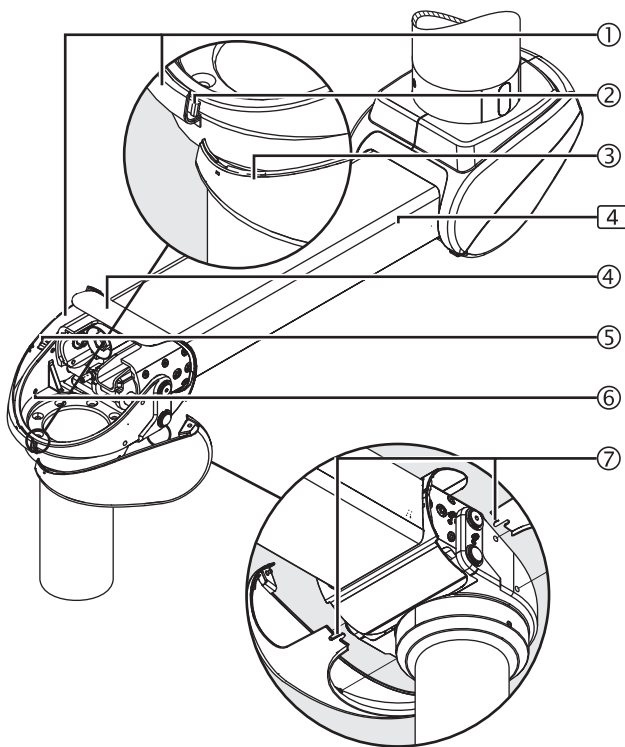
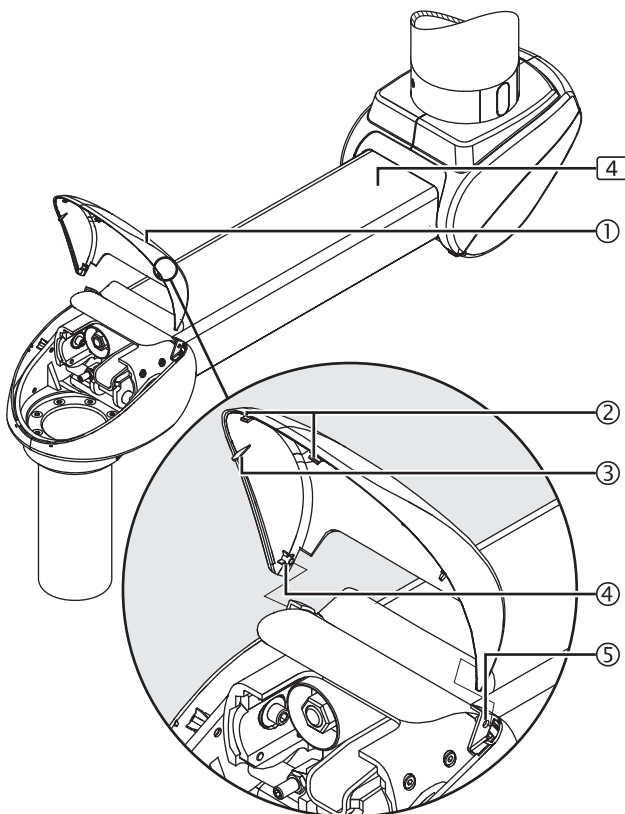


Figure 59: Mounting the front upper cover to the spring arm



### 14.7 Mounting the front side cover panels to the spring arm

(See "Figure 58")

The Figure shows the spring arm [4]. The installation procedure for the extension arm with spring arm [5] or the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified representation with only the spring arm [4] without cables.

1. Place the left-hand side cover panel ① and then insert 2 plastic pins ④ into the holes ⑤ in the spring arm.
  - Make sure that the cover plate ④ protrudes into the guide (not illustrated in the Figure) of the side cover panel ①.
2. Attach the right-hand side cover panel ③ to the mounting fixture ② on the front of the left-hand side cover panel ①, route it to the spring arm and then insert 2 plastic pins ④ into the holes ⑤ in the spring arm.
3. Make sure that the cover plate ④ protrudes into the guide (not illustrated in the Figure) of the side cover panel ③.
4. Gently push the 2 straps ⑦ at the bottom of the side cover panels into each other and engage them with each other.
5. Check that the side cover panels are securely in place:
  - The cover plate must slide in the guides (not illustrated in the Figure) of the side cover panels.
  - The side cover panels must engage tightly with each other without gaps.

### 14.8 Mounting the front upper cover to the spring arm

(See "Figure 59")

The Figure shows the spring arm [4]. The installation procedure for the extension arm with spring arm [5] or the XL extension arm with spring arm [5] version is identical.

The Figure shows a simplified representation with only the spring arm [4] without cables.

1. Place the cover ① from above and attach one of the 2 axes ④ to the mounting fixture ⑤ of the side cover panel.
2. Gently pull the front upper cover ① apart and attach the second axis ④ to the mounting fixture ⑤ of the side cover panel.
3. Fold down the cover ① until the 2 latches ② snap into place.
4. Check that the cover ① is securely in place:
  - The guides ③ of the cover ① must sit in the side cover panels.
  - The cover ① must sit on the side panels without gaps.

## 15.1 General safety instructions

### WARNING



#### Electric shock hazard

Electrical supply cables are laid in the pendant system. Contact with energised components presents a danger to life from electric shock. Disconnect the appliance from the mains before any adjustment work:

- Disconnect all poles of the pendant system from the mains and prevent it from being switched back on again.
- Make sure that all the appliances connected via the CEMOR or the Navigator M6 are de-energised.

Figure 60: Adjusting the mechanical brake for the CEMOR or the Navigator M6

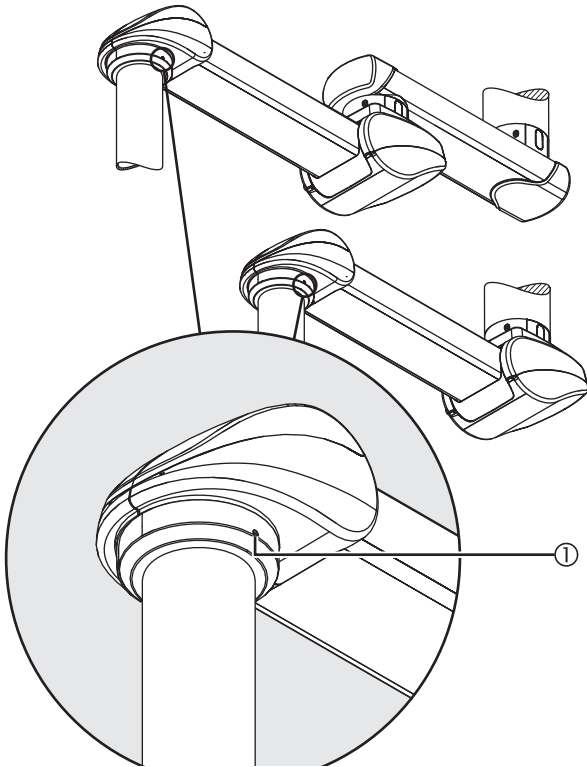
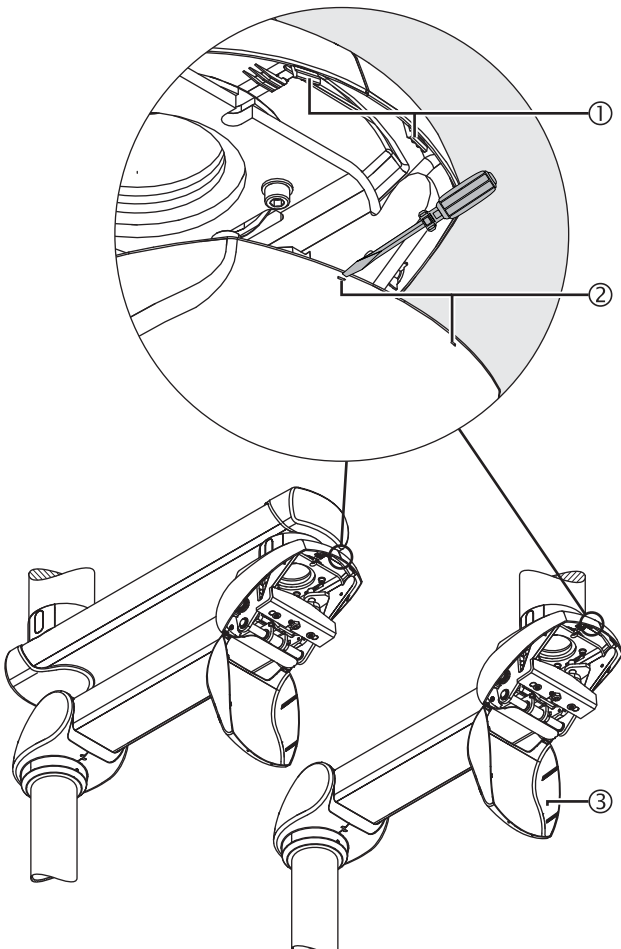


Figure 61: Opening the lower, rear cover panel



## 15.2 Adjusting the mechanical brake for the CEMOR or the Navigator M6

(See "Figure 60")

For all versions the mechanical brake (friction brake) on the Drop tube keeps the adaption (CEMOR or the Navigator M6) in the adjusted position.

Adjust the brake force of the adaption (with the appliance placed on the shelf) such that the adaption remains stable in any adjusted position and can still be conveniently adjusted.

Follow the safety instructions

Follow the general safety instructions prescribed in Chapter 15.1 on page 84.

Tool to be used

Use a suitable slotted screwdriver.

To increase the brake force

- Insert the slotted screwdriver into the brake screw ① and turn in the clockwise direction.

To reduce the brake force

- Insert the slotted screwdriver into the brake screw ① and turn in the anti-clockwise direction.

- Perform a function test.

## 15.3 Adjusting the load bearing capacity on the spring arm

(See "Figure 61")

The simplified representation illustrates the extension arm and spring arm without the cables mounted. The adjustment is identical for all versions.

The spring arm is equipped with 1 or 2 springs which compensate the weight of the CEMOR or the Navigator M6 with the end device (e.g. flat screen, medical device, etc.).

Adjust the load bearing capacity on the spring arm such that the spring arm with the CEMOR or the Navigator M6 and the end device (e.g. flat screen, medical device, etc.) remains stationary in any set position.

If the spring arm does not remain in position after adjusting the spring tension, the spring arm must be replaced by a service technician.

Possible spring equipment versions

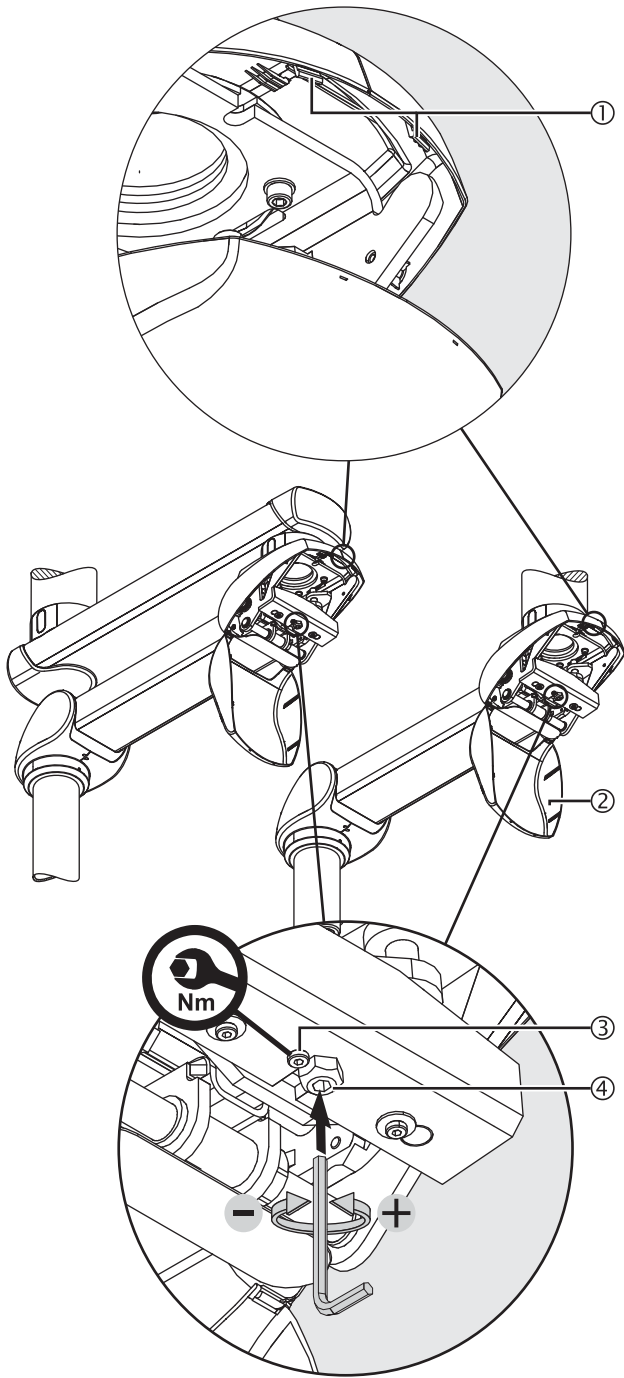
30 – 60kg, 50 – 80kg, 70 – 110kg, 80 – 135 kg, 120 – 180kg. The load bearing capacity ranges and the maximum load bearing capacity are indicated on the rating plate of the spring arm.

### 15.3.1 Opening the lower, rear cover panel

(See "Figure 61")

1. Follow the general safety instructions prescribed in Chapter 15.1 on page 84.
2. Insert a suitable screwdriver into the 2 openings ② one after the other and then disengage the 2 latches ①.
3. Fold down the upper, rear cover panel ③.

Figure 62: Adjusting the load bearing capacity and closing the lower, rear cover panel



### 15.3.2 Adjusting the load bearing capacity

(See "Figure 62")

Tool to be used

Use an Allen key (size 10) or a ring spanner (size 24).

4. Unscrew the Allen cylinder screw M8 x 16mm ③ – DIN 7984.
5. Insert the Allen key into the adjustment screw ④.
  - Lift the spring arm approx. 10 degrees above the horizontal (0 degree position) in order to relieve the tension on the adjustment screw ④.

If the spring arm moves down, the load bearing capacity is too low

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

If the spring arm moves up, the load bearing capacity is too high

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

6. Perform a function test.

7. Screw in and tighten the Allen cylinder screw M8 x 16mm ③ – DIN 7984.

#### NOTE – Load bearing capacity changing



The load bearing capacity adjustment can change progressively during operation if the Allen cylinder screw M8 x 16mm ③ – DIN 7984 has not been properly tightened:

If this is the case, the spring arm no longer remains stable in its adjusted position:

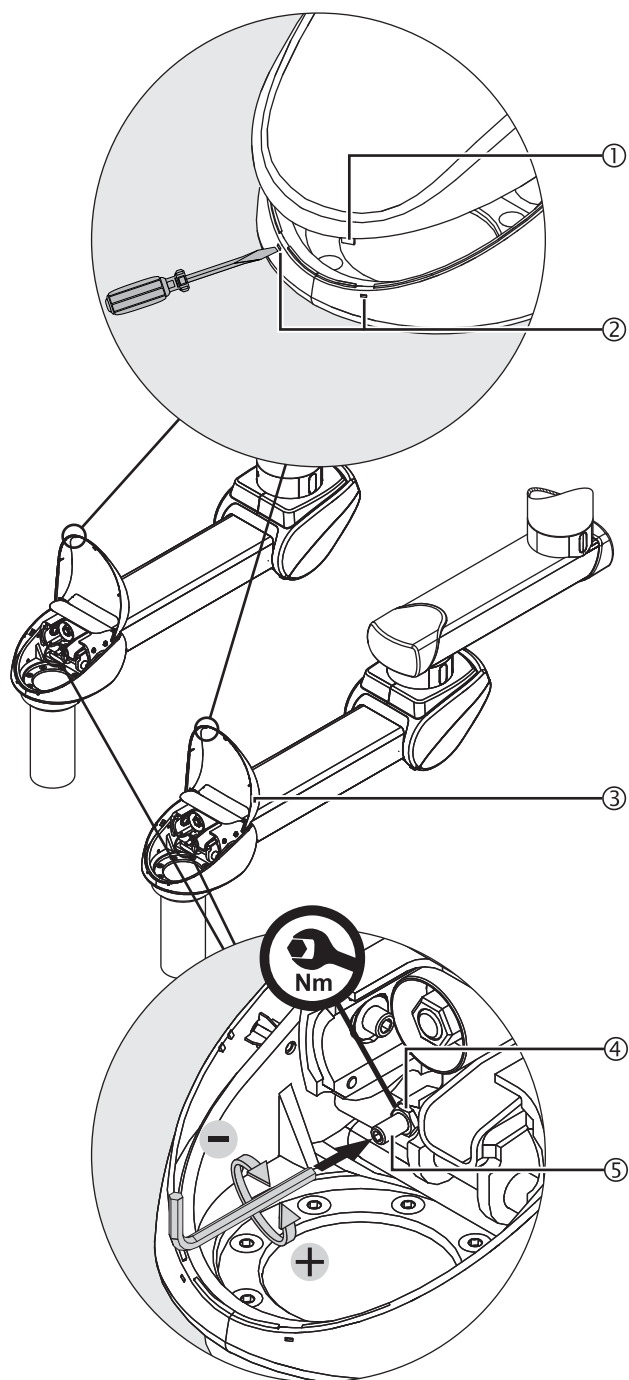
- Tighten the Allen cylinder screw M8 x 16mm ③ – DIN 7984 with a tightening torque of 12Nm.

### 15.3.3 Closing the lower, rear cover panel

(See "Figure 62")

8. Fold up the lower, rear cover panel ② until the 2 latches ① snap into place.
9. Check that the cover ② is securely in place:
  - The guides (not illustrated in the Figure) of the cover ② must sit in the side panels.
  - The cover ② must sit on the side panels without gaps.

Figure 63: Adjusting the vertical lift on the spring arm



## 15.4 Adjusting the vertical lift on the spring arm

(See "Figure 63")

When replacing an end device (e.g. flat screen, medical device, etc.) the spring arm must be adjusted to the horizontal (0 degree position).

### 15.4.1 Opening the front, upper cover panel

(See "Figure 63")

1. Follow the general safety instructions prescribed in Chapter 15.1 on page 84.
2. Insert a suitable screwdriver into the 2 openings ② one after the other and then disengage the 2 latches ①.
3. Fold up the front, upper cover ③ until it snaps into place.

### 15.4.2 Adjusting the vertical lift

(See "Figure 63")

Tool to be used

Use an Allen key (size 10) and a ring spanner (size 18).

4. Loosen and turn back the hexagonal nut M12 ④ – ISO 4035.
5. Insert the Allen key into the adjustment screw ⑤.

To reduce the vertical lift

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

To extend the vertical lift

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

6. Perform a function test.
7. Tighten the hexagonal nut M12 ④ – ISO 4035.

#### NOTE – Vertical lift changing



The vertical lift can change progressively during operation if the hexagonal nut M12 ④ – ISO 4035 has not been properly tightened:

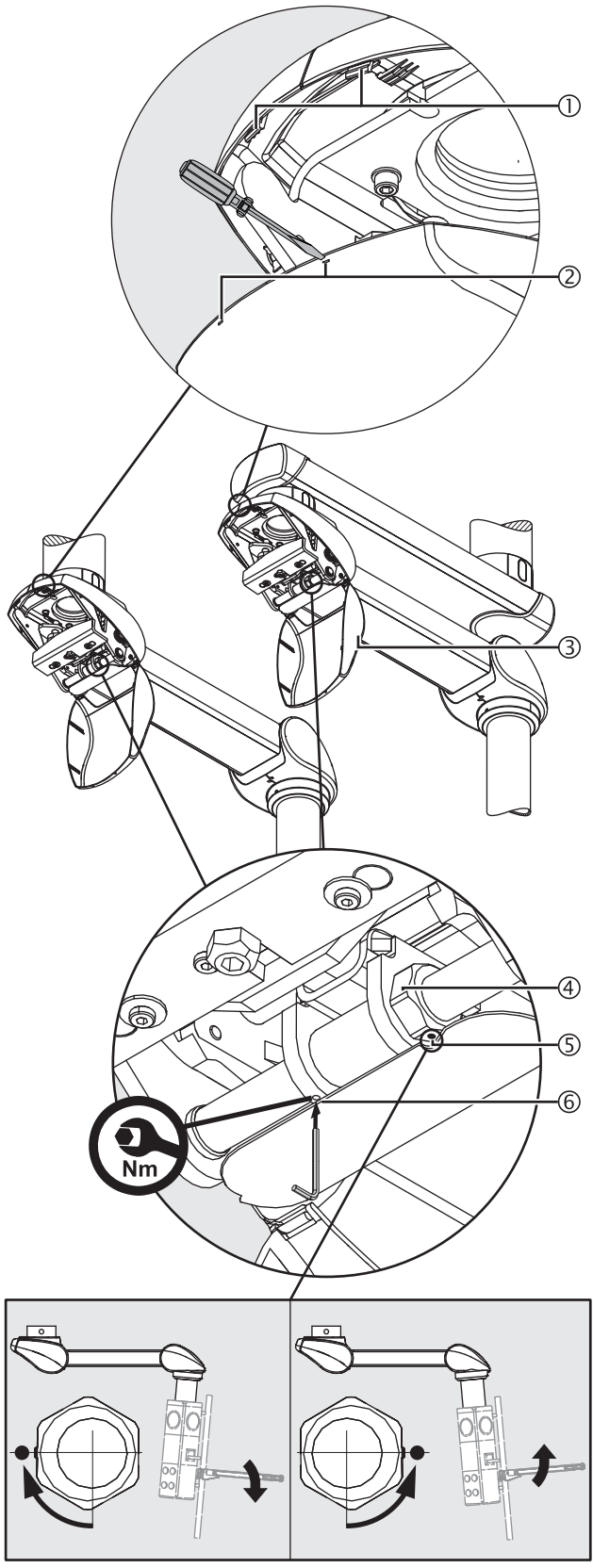
In this case there is a risk of the spring arm hitting the ceiling or another pendant system:

- Tighten the hexagonal nut M12 ④ – ISO 4035 with a tightening torque of 30Nm.

### 15.4.3 Closing the front, upper panel

8. Fold down the front, upper cover ③ such that the 2 latches ① snap into place.
9. Check that the cover ③ is securely in place:
  - The guides (not illustrated) of the cover ③ must sit in the side panels.
  - The cover ② must sit on the side panels without gaps.

Figure 64: Correcting the vertical alignment of the CEMOR or the Navigator M6



### 15.5 Correcting the vertical alignment of the CEMOR or the Navigator M6

(See "Figure 64")

After mounting an end device (e.g. flat screen, medical device, etc.) there is a risk that the CEMOR or the shelf of the Navigator M6 are no longer in a precisely vertical position due to the weight of the end device.

#### 15.5.1 Opening the lower, rear cover panel

(See "Figure 64")

1. Follow the general safety instructions prescribed in Chapter 15.1 on page 84.
2. Insert a suitable screwdriver into the 2 openings ② one after the other and then disengage the 2 latches ①.
3. Fold down the upper, rear cover panel ③.

#### 15.5.2 Correcting the vertical alignment

(See "Figure 64")

Tool to be used

Use an Allen key (size 4) and a spanner wrench (size 36).

4. Loosen the setscrew M4 ⑥ – DIN 914.
5. Place the spanner wrench onto the hexagonal bolt ④.
  - The indicator screw ⑤ points downwards (do not loosen this screw).

To lower e.g. the shelf:

- Rotate the hexagonal bolt ④ such that the indicator screw ⑤ points forwards (towards you).

To lift e.g. the shelf:

- Turn the hexagonal bolt ④ such that the indicator screw ⑤ points backwards (away from you).

6. Perform a function test.
7. Tighten the setscrew M4 ⑥ – DIN 914.

#### NOTE – Vertical alignment changing



The vertical alignment can change progressively during operation if the setscrew M4 ⑥ – DIN 914 has not been properly tightened:

If this is the case, the adaption (CEMOR or Navigator M6) no longer remains stable in its adjusted position:

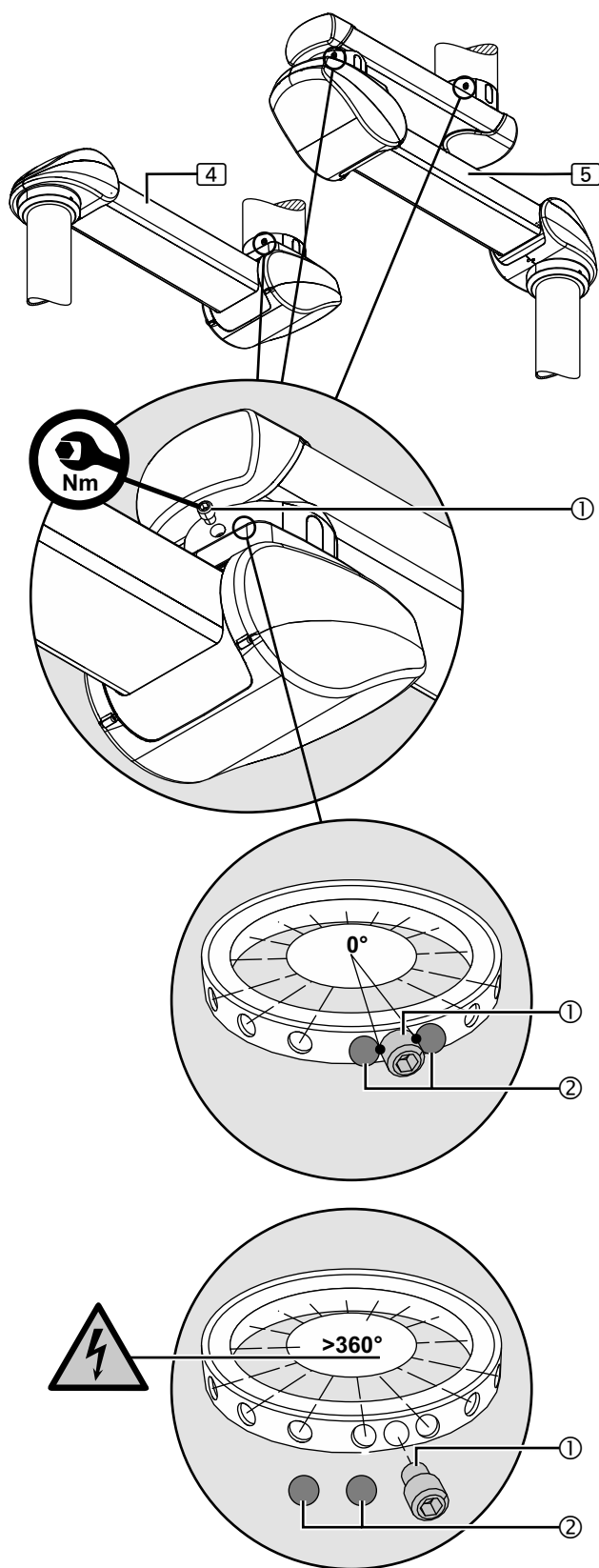
- Tighten the setscrew M4 ⑥ – DIN 914 with a tightening torque of 2Nm.

#### 15.5.3 Closing the lower, rear cover panel

(See "Figure 64")

8. Fold up the lower, rear cover ③ until the 2 latches ① snap into place.
9. Check that the cover ③ is securely in place:
  - The guides (not illustrated) of the cover ③ must sit in the side panels.
  - The cover ③ must sit on the side panels without gaps.

Figure 65: Extension arm and spring arm with pre-assembled swivel stop



## 15.6 Condition of the swivel stop on the extension arm and the spring arm supplied

### 15.6.1 Extension arm and spring arm with pre-assembled swivel stop

(See "Figure 65")

The system is supplied by default with the 2 ball stops ② and the setscrew ① pre-assembled.

The swivel range of the spring arm ④, the extension arm with spring arm ⑤ or the XL extension arm with spring arm ⑤ is thus restricted to 0 degrees. This ensures that the extension arm and the spring arm cannot be rotated and no internal supply cables can tear off.

To adjust the swivel stops

- Dismantle the swivel stops as described in Chapter 15.7.4 on page 92.

### 15.6.2 Extension arm and spring arm without pre-assembled swivel stop

(See "Figure 65")

In exceptional cases the 2 ball stops ② and the setscrew ① are delivered as separate components, which means that the spring arm ④, the extension arm with spring arm ⑤ or the extension arm with spring arm ⑤ can be rotated infinitely beyond 360 degrees.

#### ⚠ WARNING



#### Electric shock hazard

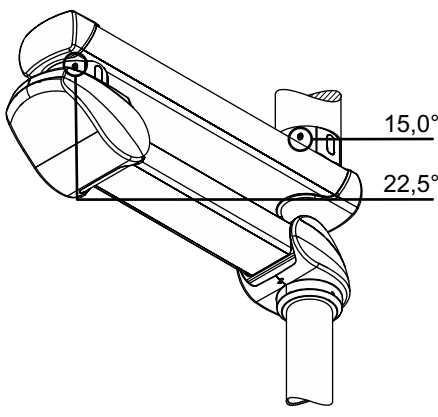
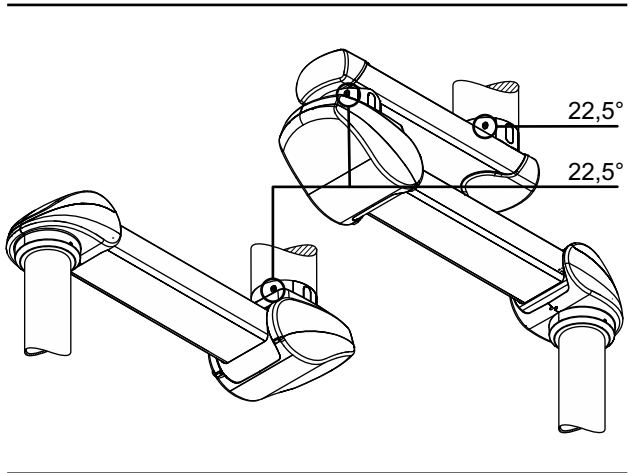
**At least 1 ball stop must be mounted in order to prevent the internal supply cables twisting off. This individual ball stop serves as twist protection:**

- If no swivel stops have been pre-assembled, the extension arm and the spring arm must not be rotated before the swivel stops have been mounted.
- Mount at least 1 ball stop as described in Chapter 15.7.3 on page 91 in order to restrict the angle of rotation of the extension arm and the spring arm to 340 degrees.

To adjust the swivel stops

- Mount the swivel stops as described in Chapter 15.7 on page 90.

Figure 66: Adjusting the swivel stop on the extension arm and spring arm  
(top: Navigator Lift™ 180 / bottom: MediLift® XL 180)



### 15.7 Adjusting the swivel stop on the extension arm and spring arm

(See "Figure 66")

The swivel stops must be adjusted during installation independently of the system and application. At least 1 swivel stop must be mounted in order to prevent the supply cables being damaged or torn off. The swivel stops must be adapted to the specific characteristics of the room during installation.

With 1 ball stop installed, the swivel range is restricted to a maximum of 340 degrees. With 2 ball stops installed, the swivel range can be restricted further.

#### ⚠ WARNING



#### Electric shock hazard

In order to prevent the internal supply cables twisting off, at least 1 ball stop must be mounted. This individual ball stop serves as twist protection:

- To restrict the angle of rotation of the extension arm and spring arm to 340 degrees, mount at least 1 ball stop as described in Chapter 15.7.3 on page 91.

#### 15.7.1 Versions

(See "Figure 66")

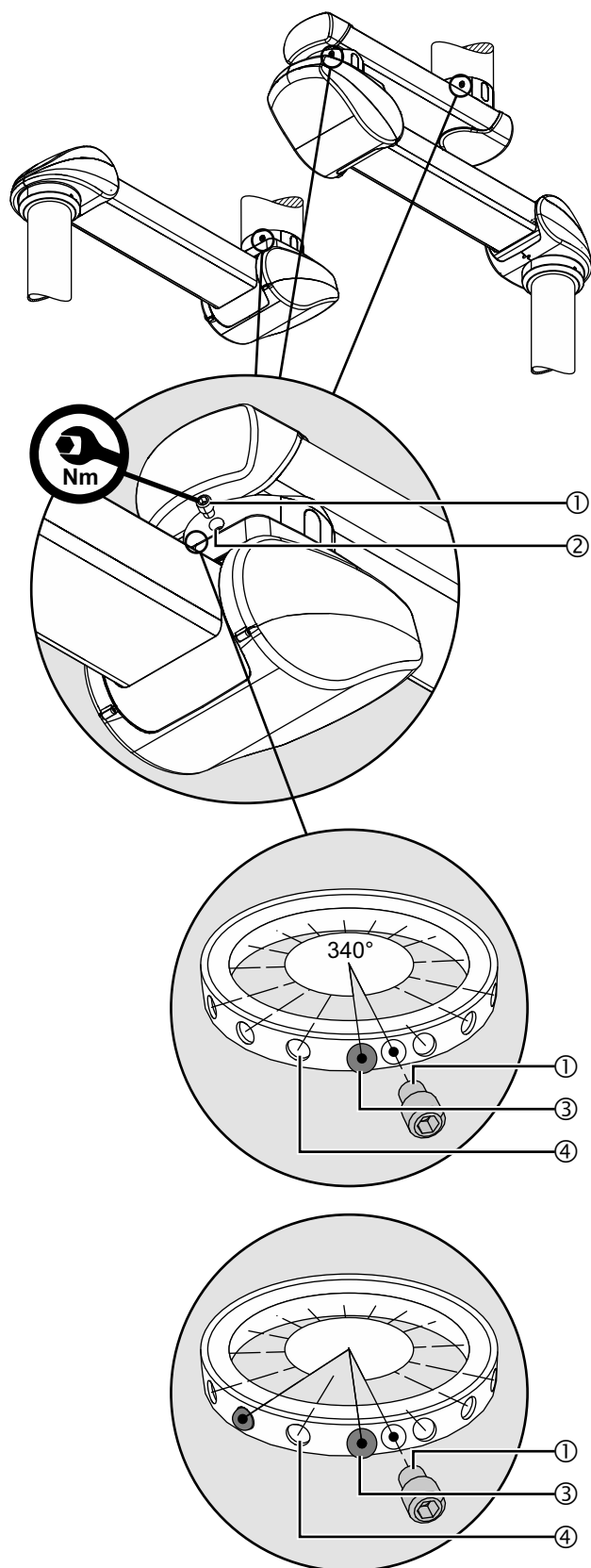
Proceed as follows in order to adjust the swivel ranges:

- Navigator Lift™ 180 Single on the extension arm and spring arm in graduations of 22.5 degrees.
  - Use 1 setscrew M16 and 2 ball stops Ø 12.7 mm for each extension arm and spring arm.
- Navigator Lift™ XL 180 Dual on the XL extension arm in graduations of 15.0 degrees and on the spring arm in graduations of 22.5 degrees.
  - For the extension arm use 1 setscrew M20 and 2 ball stops Ø 16 mm.
  - For the spring arm use 1 setscrew M16 and 2 ball stops Ø 12.7 mm.

#### 15.7.2 Tool to be used

A magnetic pin or a similar tool is required in order to offset the ball stop. The telescopic magnet pick-up tool set is available from Nuvo as an option.

Figure 67: Mounting the swivel stop



### 15.7.3 Mounting the swivel stop

(See "Figure 67")

1. Follow the general safety instructions prescribed in Chapter 15.1 on page 84.
2. The assignment and size of the setscrew ① and the ball stop ③ for the different pendant system versions are described in Chapter 15.7.1, "Versions", on page 90.
3. Unscrew a setscrew ① from the threaded hole ②.
4. Rotate the extension arm or XL extension arm or spring arm towards the desired end stop position and then insert 1 ball stop ③ into the threaded hole ②.

#### NOTE – Make sure that the ball stop is securely in place

If the ball stop ③ has completely snapped into place in one of the mounting fixtures ④, the extension arm or spring arm can be rotated. Otherwise, it is blocked and the ball stop ③ must be pushed into one of the mounting fixtures ④ using a screwdriver whilst gently rotating the extension arm or spring arm.

5. Rotate the extension arm or spring arm into the desired second end stop position and then insert 1 additional ball stop ③ into the threaded hole ②.
6. Slightly rotate the extension arm or spring arm and then screw the setscrew ① into the threaded hole ② as far as it will go.
  - The setscrew ① only serves as an end stop for the ball stop ③ mounted and restricts the swivel range of the extension arm or the spring arm.

#### ⚠ WARNING



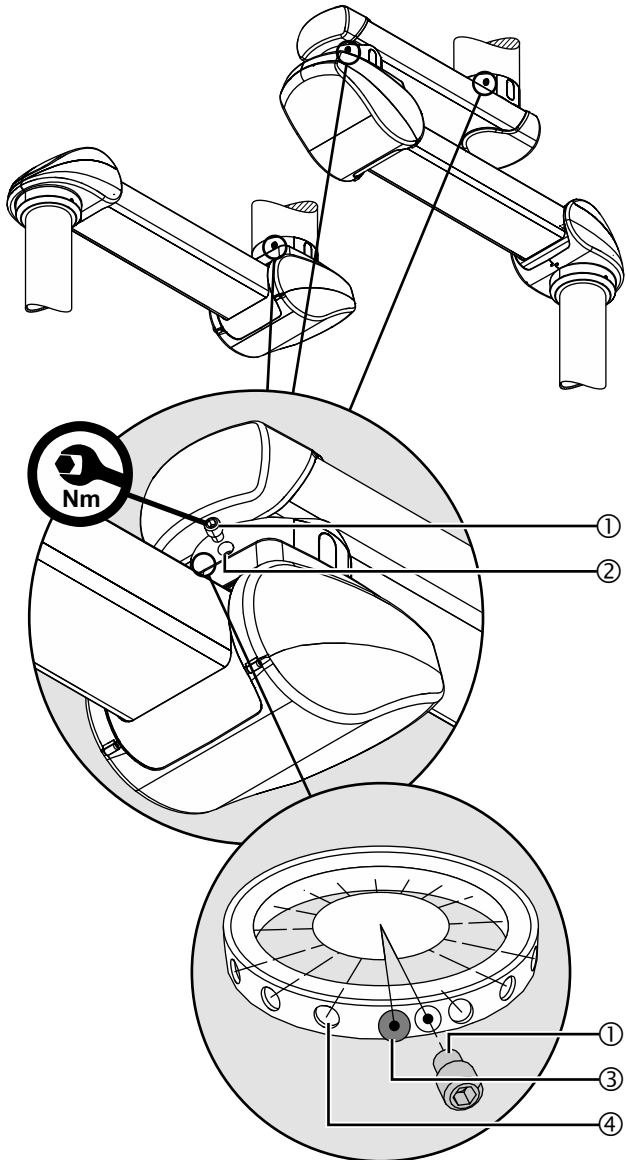
#### Risk of internal supply cables twisting off

The swivel stop can fail if the fixing elements have not been properly tightened, and the supply cables can twist off:

- Tighten the setscrew M16 ① or setscrew M20 ① to 40Nm.

7. Tighten the setscrew ① to the prescribed tightening torque.
8. To check that the swivel stop operates securely:
  - The swivel range of the extension arm or the spring arm must be restricted to less than 360 degrees.
9. To change a ball stop ③ mounted, refer to Chapter 15.7.4, "Dismantling the swivel stop", on page 92.

Figure 68: Dismantling the swivel stop



### 15.7.4 Dismantling the swivel stop

(See "Figure 68")

1. Follow the general safety instructions prescribed in Chapter 15.1 on page 84.
2. The assignment and size of the setscrew ① and the ball stop ③ for the different pendant system versions are described in Chapter 15.7.1, "Versions", on page 90.
3. Unscrew a setscrew ① from the threaded hole ②.
4. Rotate the extension arm or XL extension arm or spring arm until the ball stop ③ in the threaded hole ② is visible.
5. Using a telescopic magnet pick-up tool, remove the ball stop ③ from the threaded hole ② and keep it in a safe place.

#### ⚠ WARNING



#### Electric shock hazard

**In order to prevent the internal supply cables twisting off, at least 1 ball stop must be mounted. This individual ball stop serves as twist protection:**

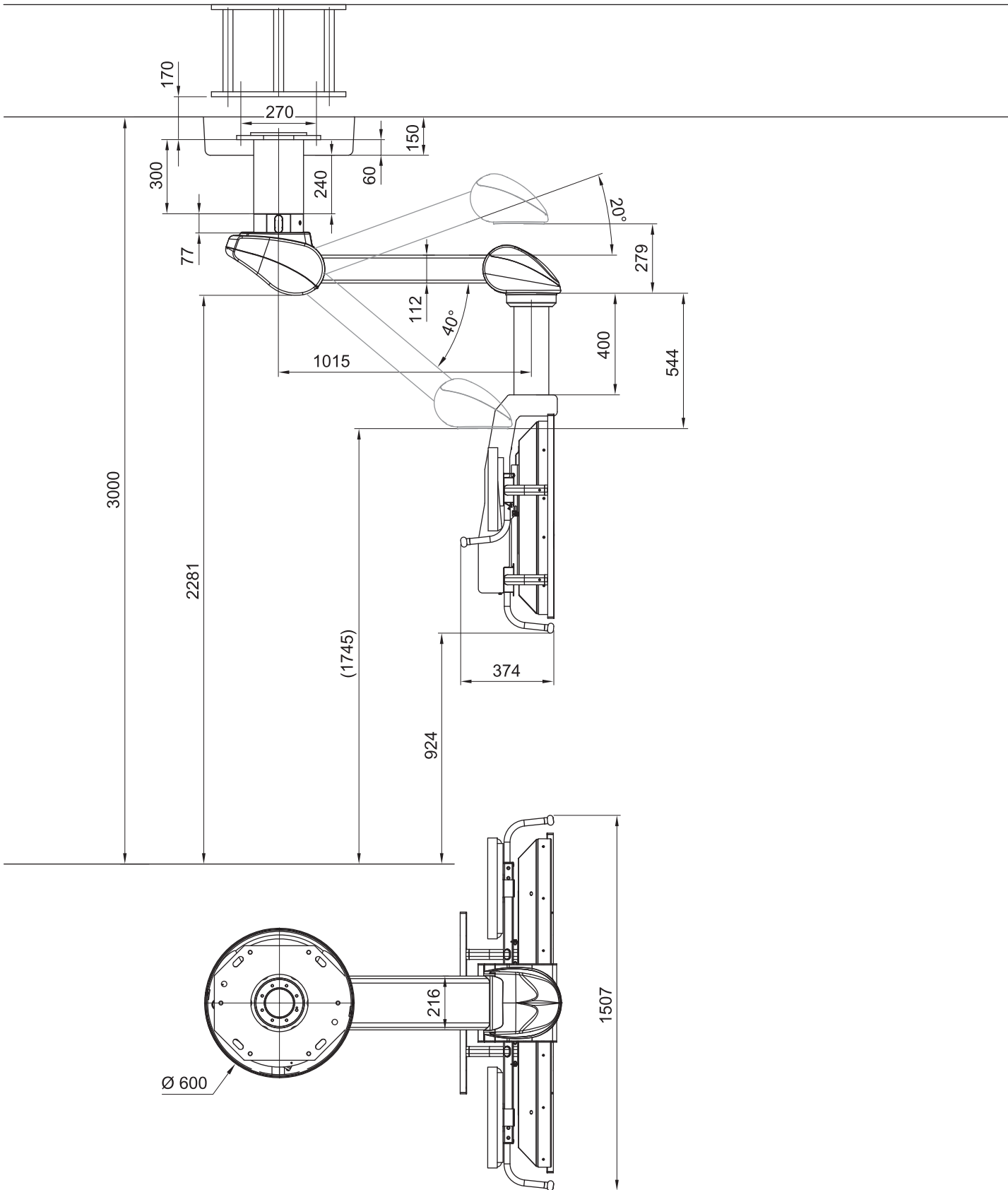
- Mount the swivel stop directly afterwards.
- Mount at least 1 ball stop ④ in order to restrict the swivel range of the extension arm or the spring arm to 340 degrees.

6. Mount the swivel stop as described in Chapter 15.7.3 on page 91.

Initial commissioning	<ol style="list-style-type: none"> <li>1. The pendant system must be installed. Instructions for installation are included in the scope of delivery of the product.</li> <li>2. For commissioning following installation, proper initial commissioning must be carried out for the entire pendant system.</li> </ol>
Functional test	<p>Prior to using the pendant system and the CEMOR or the Navigator M6 on a patient for the first time, a functional test must take place at the installation site. This functional test must be carried out by the operator or a person authorised by the operator, and the persons authorised by the operator must be duly instructed.</p> <p>This requirement is considered fulfilled if:</p> <ol style="list-style-type: none"> <li>1. the functional reliability of the pendant system and the CEMOR or the Navigator M6 has been ensured,</li> <li>2. the maximum permissible loading capacity (payload) has been safely determined and is indicated on a label attached to the Navigator M6.</li> <li>3. the proper functioning of the appliance has been approved by the operator during initial commissioning and documented by signing a declaration of acceptance.</li> </ol> <p>The following points must be observed during handover to the operator:</p> <ol style="list-style-type: none"> <li>1. The pendant system and the CEMOR or the Navigator M6 must not be handed over to the operator until they have been tested.</li> <li>2. Handover must be documented in writing including confirmation by the operator.</li> <li>3. On handover, the operator must be instructed in the functioning and effect of the maximum loading capacity (payload).</li> <li>4. In addition, the operator must be instructed in the functioning, operation, cleaning and disinfection of the pendant system and the CEMOR or the Navigator M6 during the handover procedure.</li> <li>5. Furthermore, on handover, the operator must be instructed in the adjustments permitted according to the Operating Instructions included in the scope of delivery.</li> <li>6. On completion of the instruction, an instruction certificate must be created and signed in order to document that the operator/user has understood the special operator control actions required for normal use.</li> </ol>

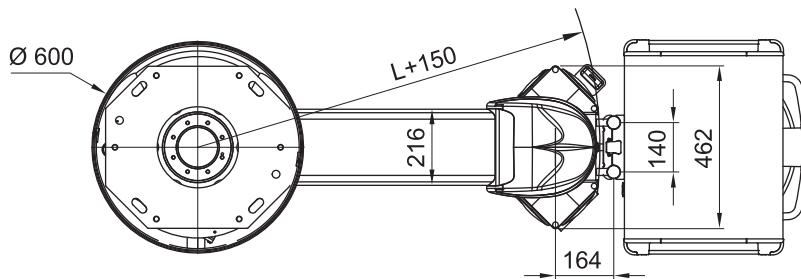
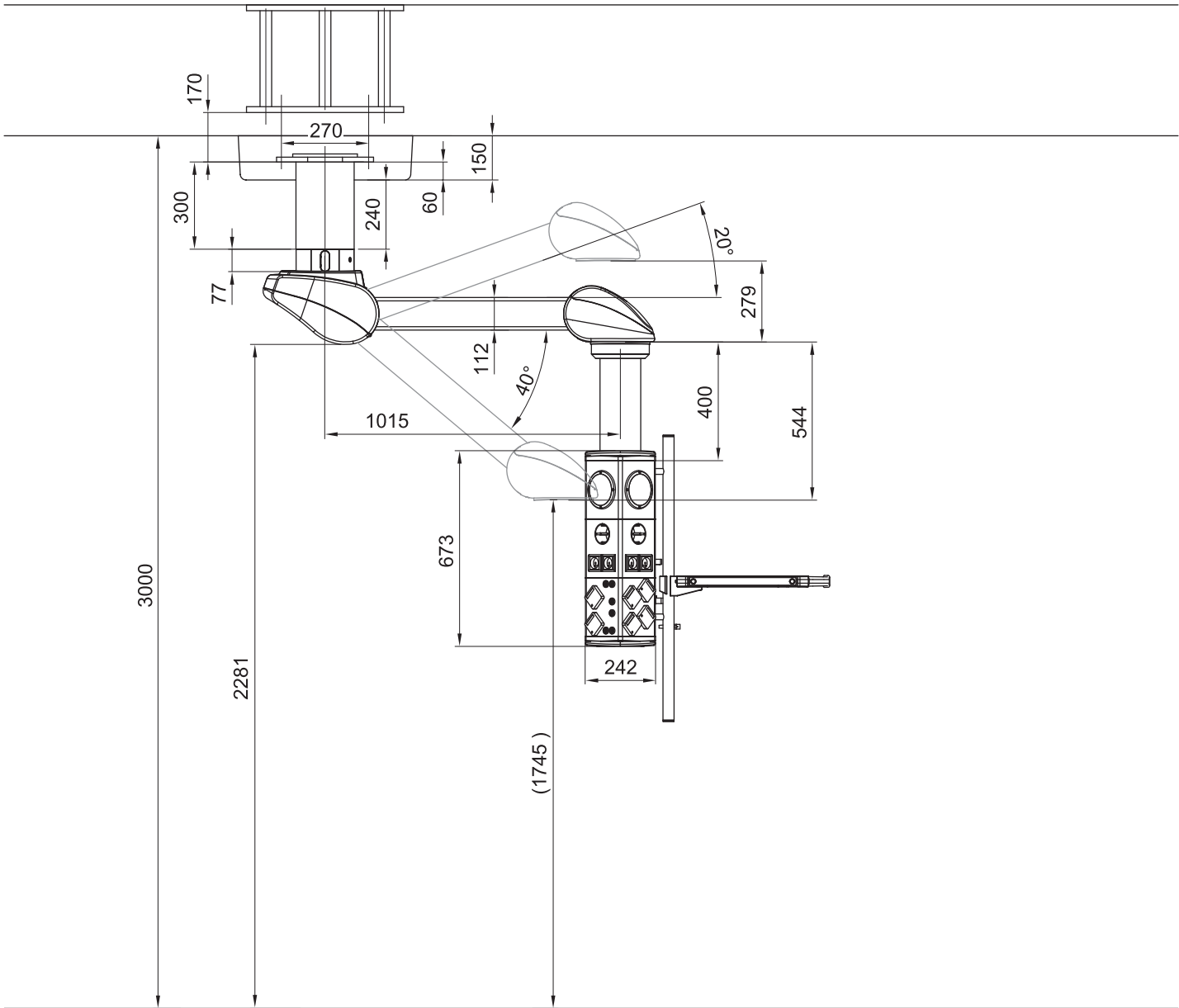
17.1 Spring arm, Navigator Lift™ 180 Single arm with CEMOR

This subchapter presents configuration examples for the Navigator Lift™ 180 Single product family. The schematic representation on this page differs from the individually configured Navigator Lift™ 180 Single. The round canopy can only be mounted with the round interface plate. The rectangular canopy 700 x 700 mm can only be mounted with the rectangular interface plate.



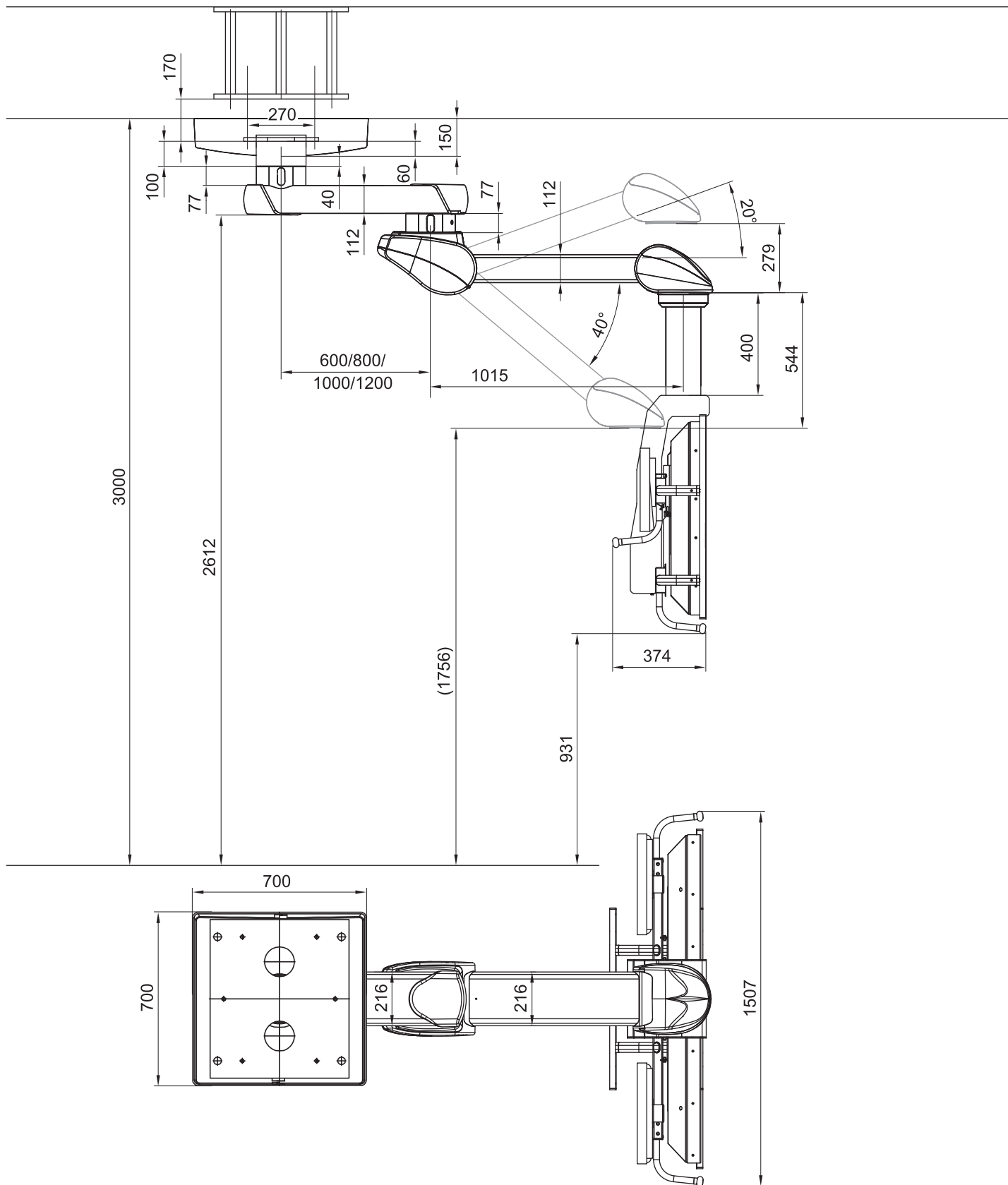
## 17.2 Spring arm, Navigator Lift™ 180 Single arm with Navigator M6

This subchapter presents configuration examples for the Navigator Lift™ 180 Single product family. The schematic representation on this page differs from the individually configured Navigator Lift™ 180 Single. The round canopy can only be mounted with the round interface plate. The rectangular canopy 700 x 700mm can only be mounted with the rectangular interface plate.



### 17.3 Extension arm with spring arm, Navigator Lift™ 180 Dual arm with CEMOR

This subchapter presents configuration examples for the Navigator Lift™ 180 Dual product family. The schematic representation on this page differs from the individually configured Navigator Lift™ 180 Dual. The round canopy can only be mounted with the round interface plate. The rectangular canopy 700 x 700mm can only be mounted with the rectangular interface plate.

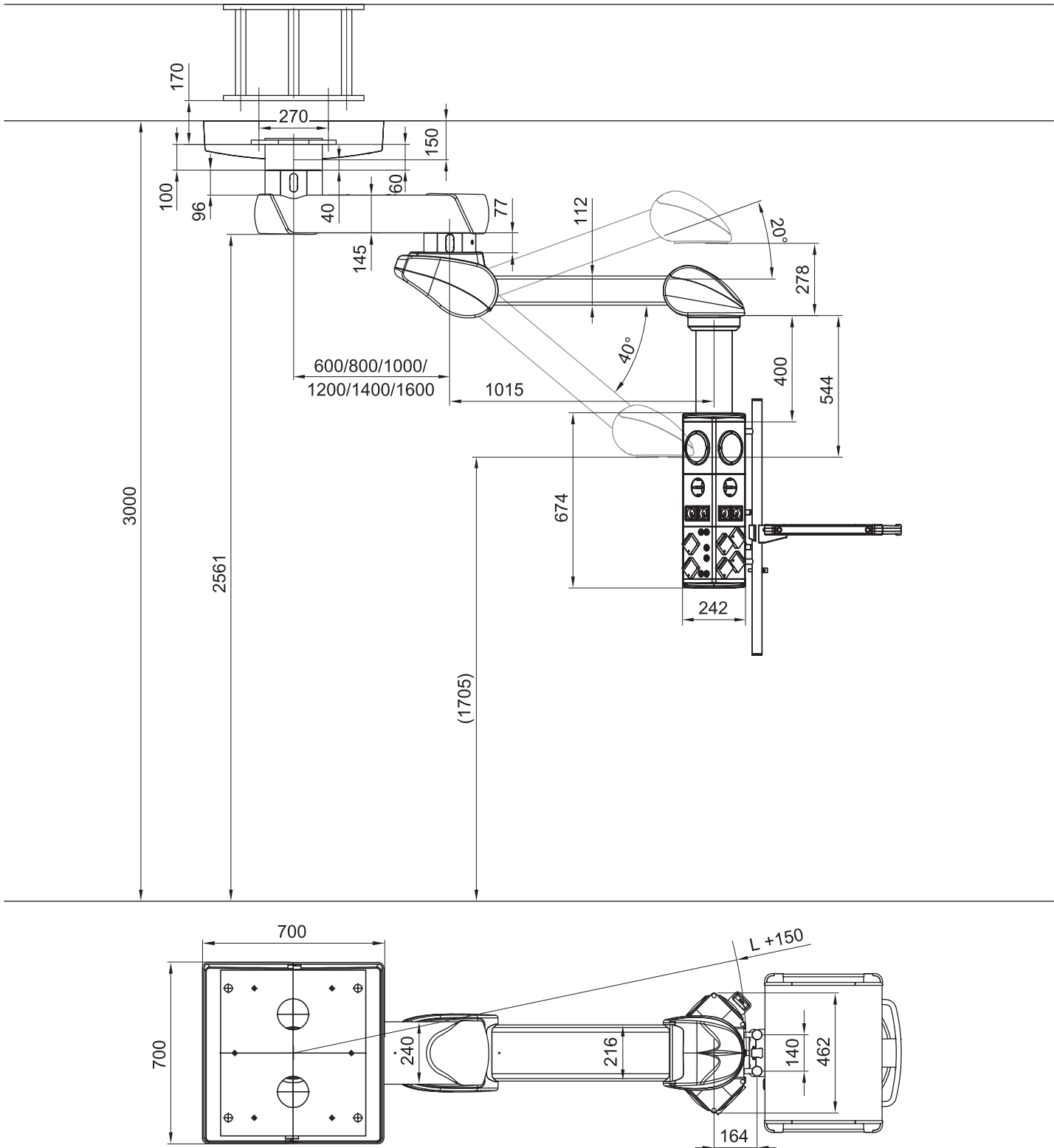






### 17.6 XL extension arm with spring arm, Navigator Lift™ XL 180 Dual arm with Navigator M6

This subchapter presents configuration examples for the Navigator Lift™ XL 180 Dual product family. The schematic representation on this page differs from the individually configured Navigator Lift™ XL 180 Dual. The round canopy can only be mounted with the round interface plate. The rectangular canopy 700 x 700mm can only be mounted with the rectangular interface plate.



Modes of operation	<ul style="list-style-type: none"> <li>The pendant systems Navigator Lift™ 180 Single, Navigator Lift™ 180 Dual, Navigator Lift™ XL 180 Dual are suitable for continuous operation.</li> </ul>																						
Duty cycle of the electromagnetic brakes	<ul style="list-style-type: none"> <li>The maximum duty cycle of the electromagnetic brakes must not exceed 1 minute.</li> <li>If the electromagnetic brakes are actuated over a longer period of time, the power pack can switch off automatically as a protection measure against overheating.</li> <li>Once the power pack has switched off, it must cool down for 10 minutes and then be disconnected from the mains for 10 seconds before being switched back on again. Normal system operation can only be resumed afterwards.</li> </ul>																						
Rating plate	<ul style="list-style-type: none"> <li>The rating plates are attached to the top side of the extension arm or XL extension arm and under the front cover of the spring arm (see Chapter 2.8 on page 20).</li> </ul>																						
Dead weight of the pendant system*	<table border="0"> <tr> <td>Spring arm 1015mm .....</td> <td>71kg</td> </tr> <tr> <td>Extension arm 600mm with spring arm 1015mm .....</td> <td>96kg</td> </tr> <tr> <td>Extension arm 800mm with spring arm 1015mm .....</td> <td>99kg</td> </tr> <tr> <td>Extension arm 1000mm with spring arm 1015mm .....</td> <td>102kg</td> </tr> <tr> <td>Extension arm 1200mm with spring arm 1015mm .....</td> <td>105kg</td> </tr> <tr> <td>XL extension arm 600mm with spring arm 1015mm .....</td> <td>112kg</td> </tr> <tr> <td>XL extension arm 800mm with spring arm 1015mm .....</td> <td>117kg</td> </tr> <tr> <td>XL extension arm 1000mm with spring arm 1015mm .....</td> <td>122kg</td> </tr> <tr> <td>XL extension arm 1200mm with spring arm 1015mm .....</td> <td>127kg</td> </tr> <tr> <td>XL extension arm 1400mm with spring arm 1015mm .....</td> <td>132kg</td> </tr> <tr> <td>XL extension arm 1600mm with spring arm 1015mm .....</td> <td>137kg</td> </tr> </table> <p>* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.</p>	Spring arm 1015mm .....	71kg	Extension arm 600mm with spring arm 1015mm .....	96kg	Extension arm 800mm with spring arm 1015mm .....	99kg	Extension arm 1000mm with spring arm 1015mm .....	102kg	Extension arm 1200mm with spring arm 1015mm .....	105kg	XL extension arm 600mm with spring arm 1015mm .....	112kg	XL extension arm 800mm with spring arm 1015mm .....	117kg	XL extension arm 1000mm with spring arm 1015mm .....	122kg	XL extension arm 1200mm with spring arm 1015mm .....	127kg	XL extension arm 1400mm with spring arm 1015mm .....	132kg	XL extension arm 1600mm with spring arm 1015mm .....	137kg
Spring arm 1015mm .....	71kg																						
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XL extension arm 1200mm with spring arm 1015mm .....	127kg																						
XL extension arm 1400mm with spring arm 1015mm .....	132kg																						
XL extension arm 1600mm with spring arm 1015mm .....	137kg																						
Dead weight of the ceiling tube for the extension arm	<table border="0"> <tr> <td>Flange .....</td> <td>6kg</td> </tr> <tr> <td>Steel tube .....</td> <td>24kg/m</td> </tr> </table>	Flange .....	6kg	Steel tube .....	24kg/m																		
Flange .....	6kg																						
Steel tube .....	24kg/m																						
Dead weight of the ceiling tube for the XL extension arm	<table border="0"> <tr> <td>Flange .....</td> <td>7.5kg</td> </tr> <tr> <td>Steel tube .....</td> <td>31.7kg/m</td> </tr> </table>	Flange .....	7.5kg	Steel tube .....	31.7kg/m																		
Flange .....	7.5kg																						
Steel tube .....	31.7kg/m																						
Dead weight of the Drop tube	<table border="0"> <tr> <td>Bearing unit .....</td> <td>5kg</td> </tr> <tr> <td>Drop tube .....</td> <td>8kg/m</td> </tr> </table>	Bearing unit .....	5kg	Drop tube .....	8kg/m																		
Bearing unit .....	5kg																						
Drop tube .....	8kg/m																						
Maximum load bearing capacity of the pendant system	<table border="0"> <tr> <td>Spring arm, 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>Extension arm 600mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>Extension arm 800mm with spring arm 1015mm .....</td> <td>170kg</td> </tr> <tr> <td>Extension arm 1000mm with spring arm 1015mm .....</td> <td>150kg</td> </tr> <tr> <td>Extension arm 1200mm with spring arm 1015mm .....</td> <td>130kg</td> </tr> <tr> <td>XL extension arm 600mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>XL extension arm 800mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>XL extension arm 1000mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>XL extension arm 1200mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>XL extension arm 1400mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> <tr> <td>XL extension arm 1600mm with spring arm 1015mm .....</td> <td>180kg</td> </tr> </table>	Spring arm, 1015mm .....	180kg	Extension arm 600mm with spring arm 1015mm .....	180kg	Extension arm 800mm with spring arm 1015mm .....	170kg	Extension arm 1000mm with spring arm 1015mm .....	150kg	Extension arm 1200mm with spring arm 1015mm .....	130kg	XL extension arm 600mm with spring arm 1015mm .....	180kg	XL extension arm 800mm with spring arm 1015mm .....	180kg	XL extension arm 1000mm with spring arm 1015mm .....	180kg	XL extension arm 1200mm with spring arm 1015mm .....	180kg	XL extension arm 1400mm with spring arm 1015mm .....	180kg	XL extension arm 1600mm with spring arm 1015mm .....	180kg
Spring arm, 1015mm .....	180kg																						
Extension arm 600mm with spring arm 1015mm .....	180kg																						
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Extension arm 1200mm with spring arm 1015mm .....	130kg																						
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XL extension arm 1200mm with spring arm 1015mm .....	180kg																						
XL extension arm 1400mm with spring arm 1015mm .....	180kg																						
XL extension arm 1600mm with spring arm 1015mm .....	180kg																						
Maximum loading capacity with different spring equipment versions	Possible spring equipment versions..22 – 40, 30 – 60, 50 – 80, 70 – 110, 80 – 135, 120 – 180kg																						

Electrical data	Rated voltage..... AC 100-240V Rated frequency ..... 60 / 50Hz Rated output ..... 220W Indirect extension arm lighting ..... DC 12V 2 / 4 lighting boards (supply voltage 12V DC, 2 lighting boards each connected in series to 24V DC)
Noise level	Sound energy level .....65db(A) (EN ISO 3746) not exceeded
Braking torque	Brake torque with the electromagnetic brake actuated on the spring arm... approx. 70Nm Brake torque with the electromagnetic brake actuated on the extension arm and spring arm ..... approx. 70Nm / approx. 70Nm Brake torque with the electromagnetic brake actuated on the XL extension arm and spring arm..... approx. 150Nm / approx. 70Nm
Manual forces	Dynamic torque with the electromagnetic brake released depending on the position and payload ..... 3.5 to 40Nm
Protection class / type	Protection class in accordance with IEC 60601-1..... I IP classification in accordance with IEC 60529 ..... IP 20
Medical Device Directive 93/42/EEC	Classification..... I
Applicable standards, laws and directives	<ul style="list-style-type: none"> <li>• Medical Devices Act (MPG)</li> <li>• 93/42 EEC (Medical Device Directive)</li> <li>• IEC 60601-1 – Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance.</li> </ul>
Approvals of the standard equipment	<ul style="list-style-type: none"> <li>• Recognised NRTL component.</li> </ul>
Approved adaptations	<p>The following Nuvo products are approved as adaptations to the pendant system:</p> <ul style="list-style-type: none"> <li>• Chapter20, “Approved Nuvo Products”, on page 107,</li> <li>• Chapter21, “Optional Accessories”, on page 107,</li> <li>• Chapter22, “Possible Combination with Third-Party Products”, on page 107:</li> <li>– The components are adapted to each other and safe to operate. Any other type of installation, and in particular the use of components from third-party manufacturers, is strictly prohibited because these components can be potential sources of danger.</li> <li>– The combination of any other Nuvo product with the pendant system must be approved by Nuvo Surgical. If applicable, the conformity assessment must be repeated.</li> </ul>
Read the Installation Instructions for combined products	<ul style="list-style-type: none"> <li>• The pendant system can be equipped with adaptations and end devices of third-party manufacturers. To prevent dangerous overload, which can damage or lead to a collapse of the pendant system, the maximum load bearing capacity specified in Chapter18, “Technical Data”, on page 100 must be adhered to.</li> <li>– The party placing the appliance into operation is responsible for the validation of the overall system. A conformity assessment procedure shall be executed if required and a declaration in accordance with Article 12 of 93/42/EEC (Medical Device Directive, MDD) shall be provided.</li> <li>– Read the Operating Instructions provided by the third-party manufacturer and in particular the relevant pages with information on the operation of the end device.</li> </ul>

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## 19.1 Guidelines and manufacturer's declarations

### 19.1.1 Electromagnetic emissions

The Navigator Lift™ is intended for use in the ELECTROMAGNETIC ENVIRONMENT specified below. The customer or the user of the Navigator Lift™ must ensure that it is used in such an environment.

Emission tests	Compliance	ELECTROMAGNETIC ENVIRONMENT – Guideline
RF emissions in accordance with CISPR 11	Group 1	The Navigator Lift™ uses RF energy only for its internal FUNCTIONING. Therefore, its RF emissions are very low and are not likely to cause any interference with electronic equipment nearby.
RF emissions in accordance with CISPR 11	Class A	The Navigator Lift™ is suitable for operation in professional healthcare facilities.
Harmonic emissions in accordance with IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions in accordance with IEC 61000-3-3	Complies	

### 19.1.2 Electromagnetic immunity

The Navigator Lift™ is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator Lift™ should ensure that it is used in such an environment.

Interference immunity test	Test level in accordance with IEC 60601	Test result
Electrostatic discharge in accordance with IEC 61000-4-2	±8kV contact ±2kV, ±4kV, ±8kV, ±15kV air	passed
Electrical fast transients / bursts in accordance with IEC 61000-4-4	±2kV 100kHz repetition rate	passed
Surges Line-to-line in accordance with IEC 61000-4-5	±0.5kV, ±1kV	passed
Surges Line-to-earth in accordance with IEC 61000-4-5	±0.5kV, ±1kV, ±2kV	passed
Voltage dips in accordance with IEC 61000-4-11	0% $U_T$ ; 1/2 period at 0, 45, 90, 135, 180, 225, 270 and 315 degrees	passed
	0% $U_T$ ; 1 period and 70% $U_T$ ; 25/30 periods Single phase: at 0 degrees	passed
Voltage interruptions in accordance with IEC 61000-4-11	0% $U_T$ ; 250/300 periods	passed
Power frequency magnetic field immunity in accordance with IEC 61000-4-8	30A/m	passed
	50Hz or 60Hz	

Please note:

$U_T$  is the a.c. mains voltage prior to application of the test level.

**Cont.**

The Navigator Lift™ is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator Lift™ should ensure that it is used in such an environment.

Interference immunity test	Test level in accordance with IEC 60601	Compliance level
Immunity to conducted disturbances, induced by radiofrequency fields IEC 61000-4-6	3V 0.15MHz to 80MHz 6V in ISM frequency bands from 0.15MHz to 80MHz 80% AM at 1kHz	passed
High-frequency electromagnetic fields in accordance with IEC 61000-4-3	3V/m 80MHz to 2.7GHz 80% AM at 1kHz	passed
NOTE 1 At 80 MHz and 800 MHz, the higher value applies.		
NOTE 2 These guidelines may not apply in all cases. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		
<sup>a</sup> The field strength of stationary transmitters, including the base stations of mobile phones and mobile land mobile radios, amateur radio stations, AM and FM radio and TV broadcasting transmitters, cannot be precisely predetermined theoretically. To assess the electromagnetic environment due to stationary RF transmitters, an electromagnetic site survey should be considered. If the field strength measured in the location in which the Navigator Lift™ is used exceeds the applicable RF compliance level above, the Navigator Lift™ should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Navigator Lift™.		
<sup>b</sup> Field strengths over the 150 kHz to 80 MHz frequency range should be less than 3 V/m.		

### 19.1.3 Test specifications

Test specifications for the INTERFERENCE IMMUNITY of ENCLOSURES against high-frequency wireless communication facilities

Test frequency MHz	Frequency band <sup>a</sup> MHz	Radio service <sup>a</sup>	Modulation <sup>b</sup>	Maximum power W	Distance m	IMMUNITY TEST LEVEL V/m
385	380 to 390	TETRA 400	Pulse modulation <sup>b</sup> 18Hz	1.8	0.3	27
450	430 to 470	GMRS 460, FRS 460	FM <sup>c</sup> ± 5kHz stroke 1kHz sine	2	0.3	28
710	704 to 787	LTE Band 13, 17	Pulse modulation <sup>b</sup> 217Hz	0.2	0.3	9
745						
780						
810	800 to 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation <sup>b</sup> 18Hz	2	0.3	28
870						
930						
1720	1700 to 1998	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation <sup>b</sup> 217Hz	2	0.3	28-
1845						
1970						
2450	2400 to 2570	Bluetooth, WLAN 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation <sup>b</sup> 217Hz	2	0.3	28
5240	5100 to 5800	WLAN 802.11 a/n	Pulse modulation <sup>b</sup> 217Hz	0.2	0.3	9
5500						
5785						

NOTE  
To reach the IMMUNITY TEST LEVELS, the distance between the transmitting antenna and the ME DEVICE or ME SYSTEM can be reduced to 1m if required. The 1 m test distance is permitted in accordance with IEC 61000-4-3.

<sup>a</sup> For certain radio services only the frequencies for the radio connection from the mobile communication device to the base station ("up-link") are indicated in the table.

<sup>b</sup> The carrier must be modulated with a square wave signal with a 50% duty cycle.

<sup>c</sup> As an alternative to frequency modulation (FM), pulse modulation with a 50% duty cycle at 18Hz can be used because pulse modulation would also represent the worst case (but not the actual modulation).

**⚠ WARNING**

Do not operate this device immediately next to or together with other devices stacked on top of each other because this could result in improper operation. If operation in the described manner is unavoidable, this device and all other devices should be monitored in order to ensure proper operation."

**⚠ WARNING**

The use of other ACCESSORIES, other converters and other cables than those prescribed or provided by the MANUFACTURER of this device can lead to increased ELECTROMAGNETIC INTERFERENCE EMISSIONS or reduced electromagnetic immunity of the device, and thus improper operation.

**⚠ WARNING**

PORTABLE RF communication devices (radio equipment, including ACCESSORIES such as antenna cables and external antennas) should not be used at a distance of less than 30cm (12inches) from the Navigator Lift™ components and cables specified by the MANUFACTURER. Be aware that the performance of the device can be reduced if this safety rule is not observed.

Designation
CEMOR and approved Nuvo products in accordance with the current Operating Instructions of the CEMOR.
Navigator M6 and approved end devices in accordance with the current Operating Instructions of the Navigator M6.

## 21 Optional Accessories

Designation	Dead weight	Maximum payload
Indirect extension arm lighting	2.0 kg	---
Brake indicator lighting board	0.1 kg	---
Adapter Acrobat Swing 3p, L360*	2.2kg	10kg / 113Nm

\* The accessories can only be used if the extension arm has been supplied with preparation for adapter.  
This option can be selected for the dual-arm variant on the upper extension arm:  
Navigator™ in lengths of 800mm and 1000mm  
Navigator™ XL in lengths of 1000mm and 1200mm

## 22 Possible Combination with Third-Party Products

Approved third-party products with CE mark
For more detailed information on the requirements for the interface towards the pendant system please contact Nuvo customer service so as to prevent damage to persons or property:
<ul style="list-style-type: none"> <li>• Phone: +1 (800) 663-1152 (USA and CANADA)</li> <li>• Phone: +1 (814) 899-4220 (INTERNATIONAL)</li> </ul>
The party placing the appliance into operation is responsible for the validation of the overall system. A conformity assessment procedure shall be executed if required and a declaration in accordance with Article 12 of 93/42/EEC (Medical Device Directive, MDD) shall be provided.



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