



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

Navigator Lift™ 150 AirPlus Single, Navigator Lift™ 250 AirPlus Single, Navigator Lift™ 150 AirPlus Dual  
Navigator Lift™ 150 Friction Single, Navigator Lift™ 150 Friction Dual, Navigator Lift™ 250 Friction Single



A member of the  
Medical Illumination International Group

**Dear assembly operator,**

Please read these Installation Instructions very carefully, and in particular Chapter “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 pendant system may only be mounted by the Nuvo technical service team or trained and authorised service personnel.</li> </ul>  |
| Inspections to be performed prior to installation | <ul style="list-style-type: none"> <li>• The load bearing capacity of the ceiling or 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 device to the mains may only be performed by a qualified electrician whilst the device 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 device, installation work must be discontinued.</li> <li>• The safety, reliability and performance of the device are only assured if genuine Nuvo parts 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 pendant system are not permitted for safety reasons. No modification or conversion may be performed without authorisation. Otherwise, the manufacturer's warranty for the pendant system will be void. The manufacturer hereby refutes 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 for the pendant system 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 recognise the potential hazards involved on the basis of their professional experience and instruction in safety-relevant regulations.</li> <li>• In states where job activities in the medical engineering sector are subject to certification, qualified personnel must have obtained the corresponding certificate.</li> </ul>  |

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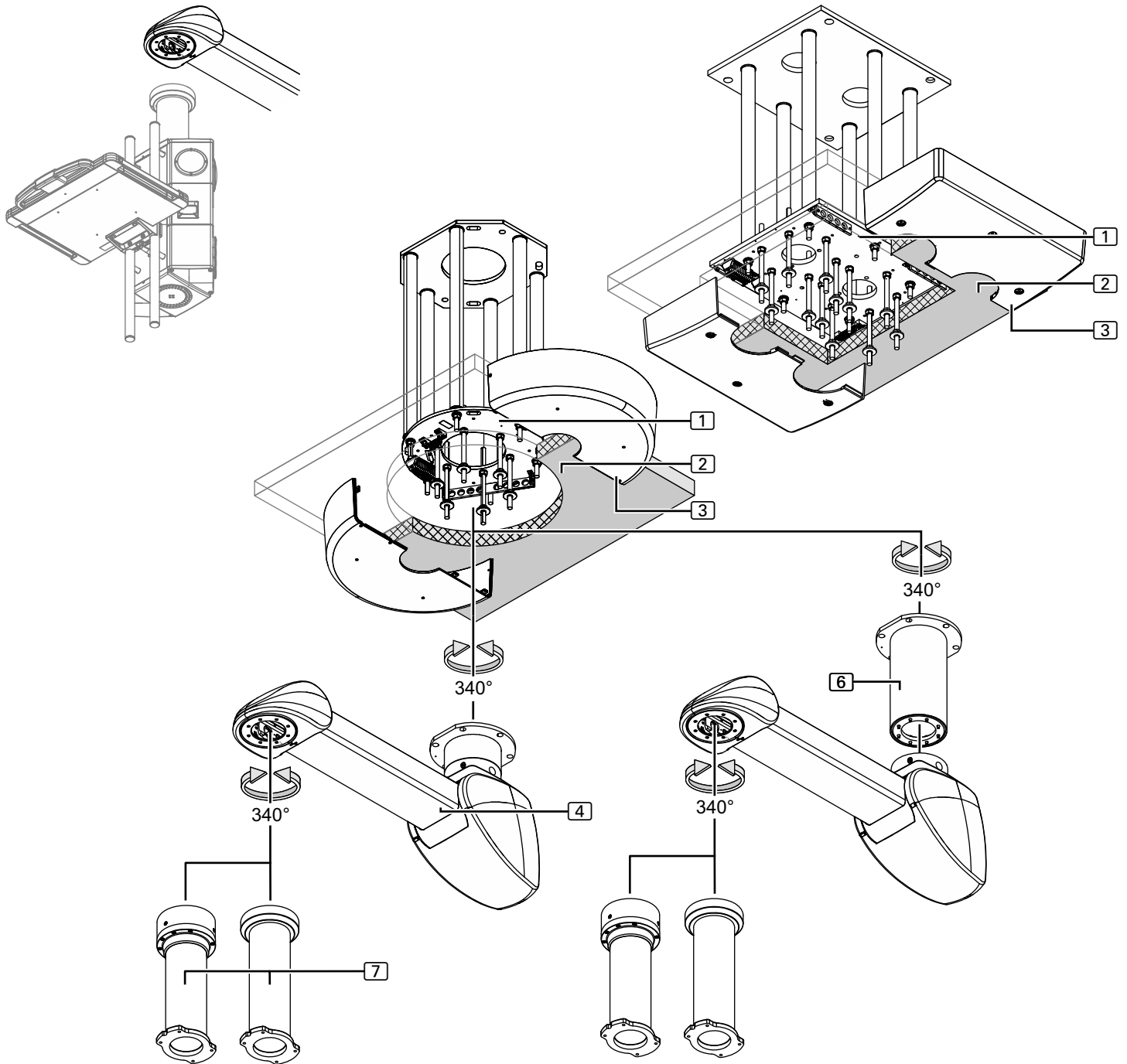
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Figure 1: Scope of delivery of the motor arm, Navigator Lift™ 150 / 250 AirPlus – Single arm

1.1 Overview of the pendant system Navigator Lift™ 150 / 250 AirPlus – Single arm



See "Figure 1: on Page 8"

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

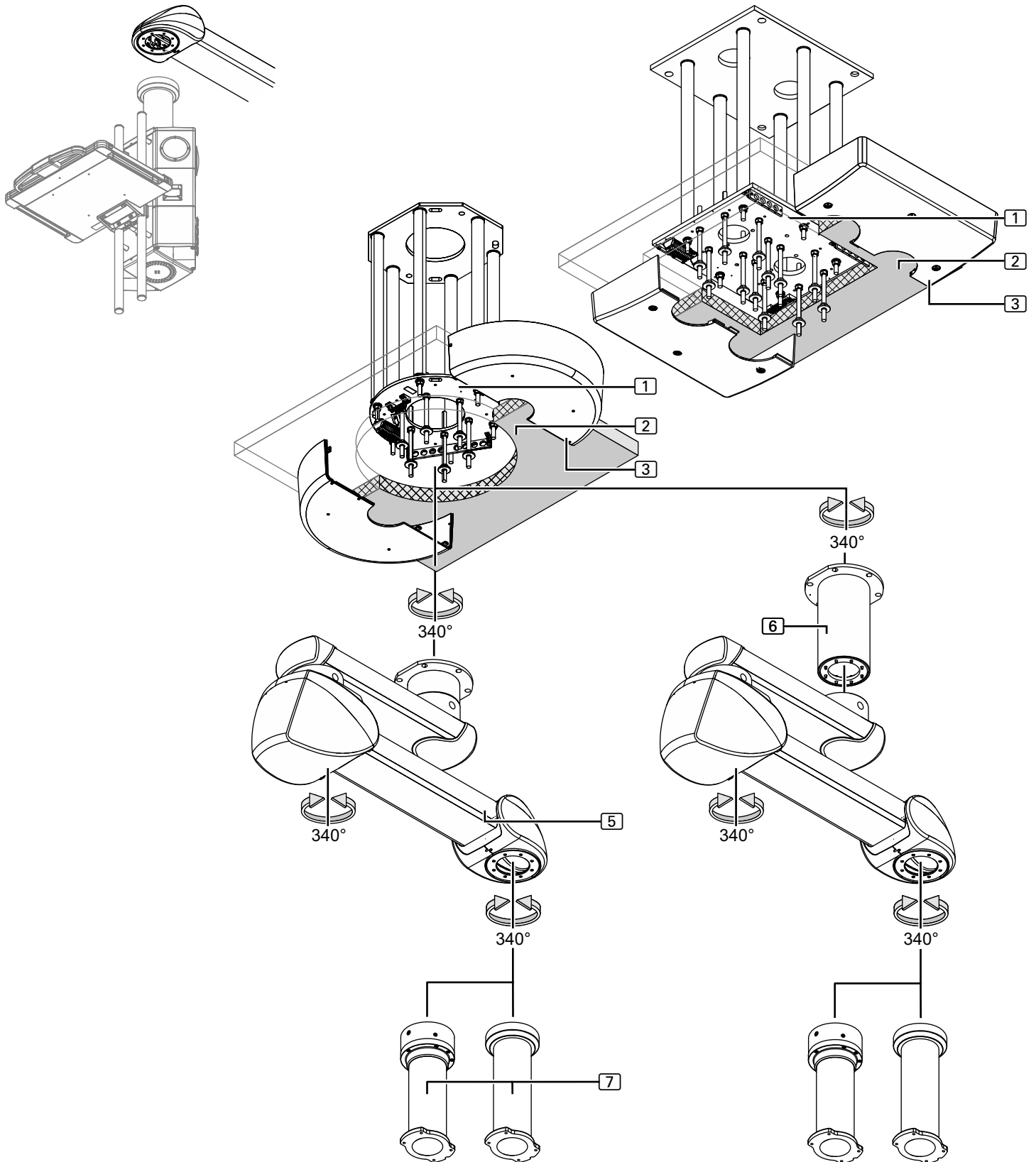
## 1.2 Scope of delivery of the motor arm, Navigator Lift™ 150 / 250 AirPlus – Single arm

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

Canopy fixing elements	<ul style="list-style-type: none"> <li>③ Canopy (Single / Dual) (Flat / High) (depending on the version) Installation as described in Chapter 14, on Page 71               <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 Dual canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm</li> <li>– 1 Dual 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>④ Motor arm with ceiling tube (pre-assembled) Installation as described in Chapter 8, on Page 39               <ul style="list-style-type: none"> <li>– 1 motor arm with ceiling tube</li> <li>– 1 power supply cable</li> <li>– 2 pneumatic pipes for pneumatic brake control</li> <li>– 3 earthing cables 4mm<sup>2</sup> (2 earthing cables for unassembled ceiling tube)</li> <li>– 1 setscrew M16 – DIN EN ISO 4028,</li> <li>– 2 ball stops Ø 12.7mm</li> <li>– 2 voltage selection plugs for the selection of the 120V / 230V power supply</li> <li>– 2 side panels, front right / left joint for the motor arm</li> <li>– 1 cover, front joint, for the motor arm</li> <li>– 2 cover straps, front joint, for the motor arm</li> <li>– 2 side panels, front right / left joint, for the motor arm</li> <li>– 1 cover, rear joint, for the motor arm</li> <li>– 2 cover straps, rear joint, for the motor 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 components or components incl. in the scope of delivery (see Chapter 15.7, on Page 83)	<ul style="list-style-type: none"> <li>⑥ Extended motor arm ceiling tube Pre-installation as described in Chapter 7, on Page 35               <ul style="list-style-type: none"> <li>– 1 ceiling tube (order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 1 socket wrench extension (for 500 and 700mm ceiling tube lengths 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>
Motor arm fixing elements	<ul style="list-style-type: none"> <li>⑦ Drop tube with Bearing Unit Friction (slide bearing / roller bearing) Installation as described in Chapter 9, on Page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 18mm – 10.9 – DIN EN ISO 10642</li> <li>– included in the scope of delivery of the Navigator M6</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 with Bearing Unit Friction (slide bearing / roller bearing) Installation as described in Chapter 9, on Page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 18mm – 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>⑦ Drop tube with Bearing Unit Friction (slide bearing / roller bearing) Installation as described in Chapter 9, on Page 45               <ul style="list-style-type: none"> <li>– 1 Drop tube (order-specific length)</li> <li>– 1 earthing cable, 4mm<sup>2</sup></li> <li>– 8 Allen countersunk screws M10 x 18mm – 10.9 – DIN EN ISO 10642</li> <li>– included in the scope of delivery of the Navigator M6</li> </ul> </li> </ul>

Figure 2: Scope of delivery of the extension arm with motor arm, Navigator Lift™ 150 / 250 AirPlus – Dual arm

### 1.3 Overview of the pendant system Navigator Lift™ 150 / 250 AirPlus – Dual arm



See "Figure 2: on Page 10"

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

#### 1.4 Scope of delivery of the extension arm with motor arm, Navigator Lift™ 150 / 250 AirPlus – Dual arm

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

- ③ Canopy (Single / Dual) (Flat / High) (depending on the version)  
Installation as described in Chapter 14, on Page 71
  - 1 Single canopy Ø 600mm x 150mm, 1 canopy attachment 110mm high
  - 1 Single canopy – 700mm x 700mm x 150mm high
  - 1 Dual canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm
  - 1 Dual 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

Canopy fixing elements

- ⑤ Extension arm with motor arm and ceiling tube (pre-assembled)  
Installation as described in Chapter 8, on Page 39
  - 1 extension arm with motor arm and ceiling tube
  - 1 power supply cable
  - 3 pneumatic pipes for pneumatic brake control
  - 4 earthing cables 4 mm<sup>2</sup> (3 earthing cables for unassembled ceiling tube)
  - 2 setscrews M16 – DIN EN ISO 4028,
  - 4 ball stops Ø 12.7mm
  - 2 voltage selection plugs for the selection of the 120V / 230V power supply
  - 2 section end caps for the extension arm
  - 2 side panels, front right / left joint for the motor arm
  - 1 cover, front joint, for the motor arm
  - 2 cover straps, front joint, for the motor arm
  - 2 side panels, front right / left joint, for the motor arm
  - 1 cover, rear joint, for the motor arm
  - 2 cover straps, rear joint, for the motor 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 components

Pre-assembled components or components  
incl. in the scope of delivery  
(see Chapter 15.7, on Page 83)

Fixing elements of the extension arm

- ⑥ Extended ceiling tube  
Pre-installation as described in Chapter 7, on Page 35
  - 1 ceiling tube (order-specific length)
  - 1 earthing cable, 4 mm<sup>2</sup>
  - 1 socket wrench extension (for 500 and 700mm ceiling tube lengths 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

- ⑦ Drop tube with Bearing Unit Friction (slide bearing / roller bearing)  
Installation as described in Chapter 9, on Page 45
  - 1 Drop tube (order-specific length)
  - 1 earthing cable, 4 mm<sup>2</sup>
  - 8 Allen countersunk screws M10 x 18mm – 10.9 – DIN EN ISO 10642
  - included in the scope of delivery of the Navigator M6

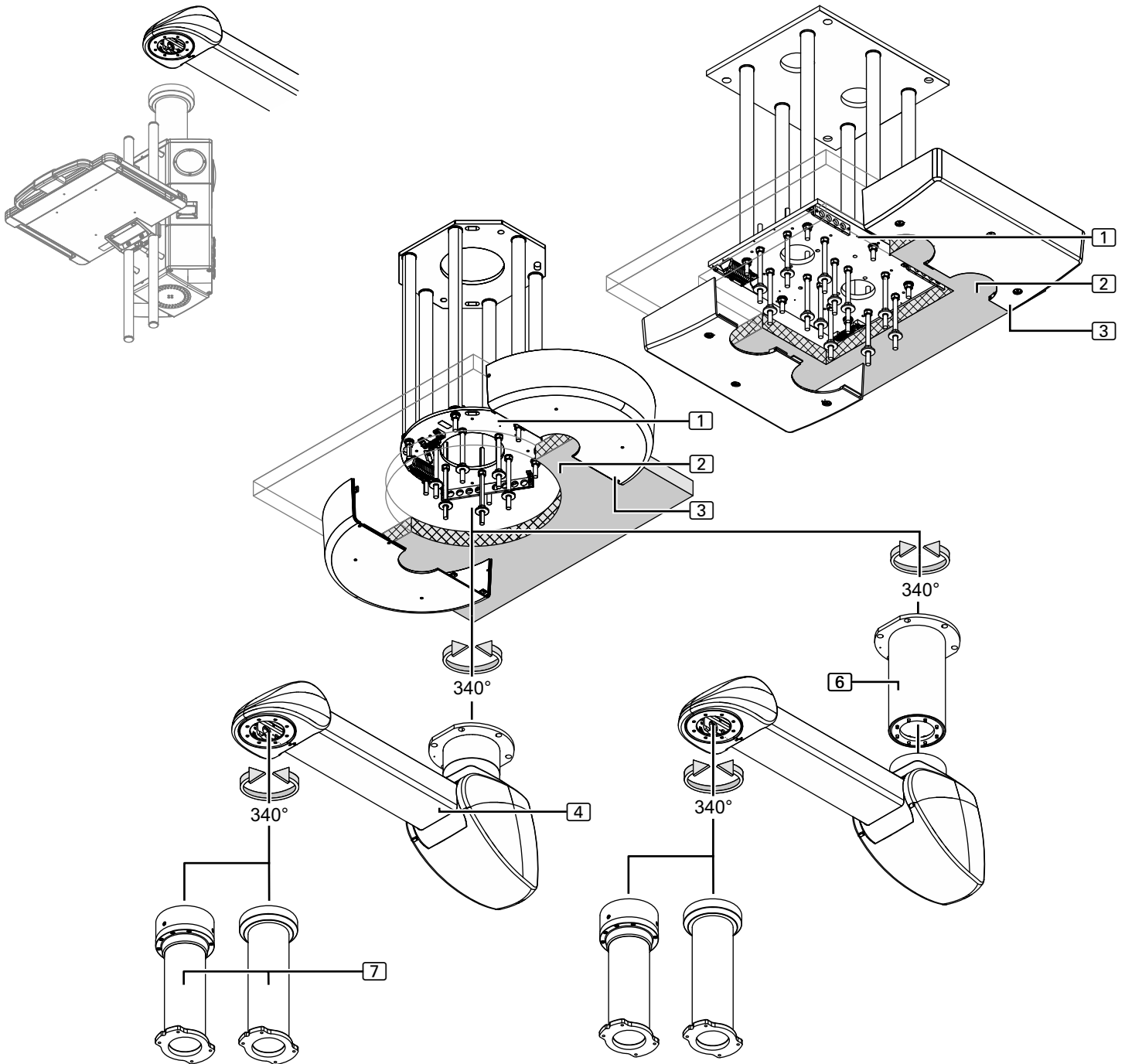
Pre-assembled components

Drop tube fixing elements

Drop tube fixing elements  
mounted to the Navigator M6

Figure 3: Scope of delivery of the motor arm,  
Navigator Lift™ 150 / 250 Friction – Single  
arm

### 1.5 Overview of the pendant system Navigator Lift™ 150 / 250 Friction – Single arm



See "Figure 3: on Page 12"

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

## 1.6 Scope of delivery of the motor arm, Navigator Lift™ 150 / 250 Friction – Single arm

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

- ③ Canopy (Single / Dual) (Flat / High) (depending on the version)  
Installation as described in Chapter 14, on Page 71
  - 1 Single canopy Ø 600mm x 150mm, 1 canopy attachment 110mm high
  - 1 Single canopy – 700mm x 700mm x 150mm high
  - 1 Dual canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm
  - 1 Dual 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

Canopy fixing elements

- ④ Motor arm with ceiling tube (pre-assembled)  
Installation as described in Chapter 8, on Page 39
  - 1 motor arm with ceiling tube
  - 1 power supply cable
  - 3 earthing cables 4mm<sup>2</sup> (2 earthing cables for unassembled ceiling tube)
  - 1 setscrew M16 – DIN EN ISO 4028,
  - 2 ball stops Ø 10mm
  - 2 voltage selection plugs for the selection of the 120V / 230V power supply
  - 2 side panels, front right / left joint for the motor arm
  - 1 cover, front joint, for the motor arm
  - 2 cover straps, front joint, for the motor arm
  - 2 side panels, front right / left joint, for the motor arm
  - 1 cover, rear joint, for the motor arm
  - 2 cover straps, rear joint, for the motor 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 components

Pre-assembled components or components  
incl. in the scope of delivery  
(see Chapter 15.7, on Page 83)

Motor arm fixing elements

- ⑥ Extended motor arm ceiling tube  
Pre-installation as described in Chapter 7, on Page 35
  - 1 ceiling tube (order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 1 socket wrench extension (for 500 and 700mm ceiling tube lengths 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

- ⑦ Drop tube with Bearing Unit Friction (slide bearing / roller bearing)  
Installation as described in Chapter 9, on Page 45
  - 1 Drop tube (order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 8 Allen countersunk screws M10 x 18mm – 10.9 – DIN EN ISO 10642
  - included in the scope of delivery of the Navigator M6

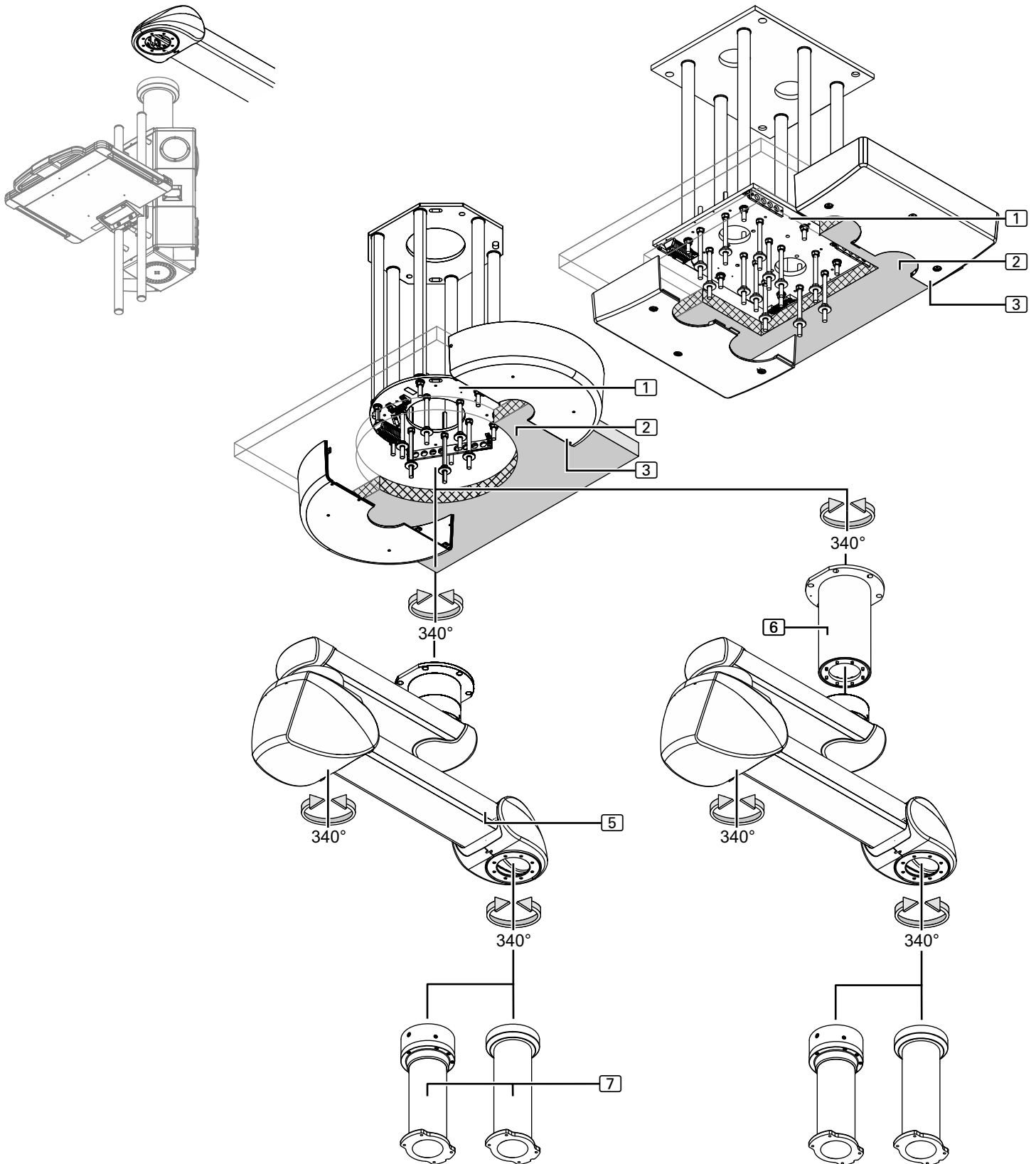
Pre-assembled components

Drop tube fixing elements

Drop tube fixing elements mounted to the  
Navigator M6

Figure 4: Scope of delivery of the extension arm with motor arm, Navigator Lift™ 150 / 250 Friction – Dual arm

## 1.7 Overview of the pendant system Navigator Lift™ 150 / 250 Friction – Dual arm



See "Figure 4: on Page 14"

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

## 1.8 Scope of delivery of the extension arm with motor arm, Navigator Lift™ 150 / 250 Friction – Dual arm

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

- ③ Canopy (Single / Dual) (Flat / High) (depending on the version)  
Installation as described in Chapter 14, on Page 71
  - 1 Single canopy Ø 600mm x 150mm, 1 canopy attachment 110mm high
  - 1 Single canopy – 700mm x 700mm x 150mm high
  - 1 Dual canopy (installation with intermediate ceiling) – 700mm x 700mm x 50mm
  - 1 Dual 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
- ⑤ Extension arm with motor arm and ceiling tube (pre-assembled)  
Installation as described in Chapter 8, on Page 39
  - 1 extension arm with motor arm and ceiling tube
  - 1 power supply cable
  - 4 earthing cables 4mm<sup>2</sup> (3 earthing cables for unassembled ceiling tube)
  - 2 setscrews M16 – DIN EN ISO 4028,
  - 4 ball stops Ø 10mm
  - 2 voltage selection plugs for the selection of the 120V / 230V power supply
  - 2 section end caps for the extension arm
  - 2 side panels, front right / left joint for the motor arm
  - 1 cover, front joint, for the motor arm
  - 2 cover straps, front joint, for the motor arm
  - 2 side panels, front right / left joint, for the motor arm
  - 1 cover, rear joint, for the motor arm
  - 2 cover straps, rear joint, for the motor 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
- ⑥ Extended ceiling tube  
Pre-installation as described in Chapter 7, on Page 35
  - 1 ceiling tube (order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 1 socket wrench extension (for 500 and 700mm ceiling tube lengths only)
  - 8 Allen cylinder screws M10 x 25mm – 8.8 – DIN EN ISO 4762
  - 8 lock washers S10
- ⑦ Drop tube with Bearing Unit Friction (slide bearing / roller bearing)  
Installation as described in Chapter 9, on Page 45
  - 1 Drop tube (order-specific length)
  - 1 earthing cable, 4mm<sup>2</sup>
  - 8 Allen countersunk screws M10 x 18mm – 10.9 – DIN EN ISO 10642
  - included in the scope of delivery of the Navigator M6

Canopy fixing elements

Pre-assembled components

Pre-assembled components or components  
incl. in the scope of delivery  
(see Chapter 15.7, on Page 83)

Fixing elements of the extension arm

Loose components  
incl. in the scope of delivery

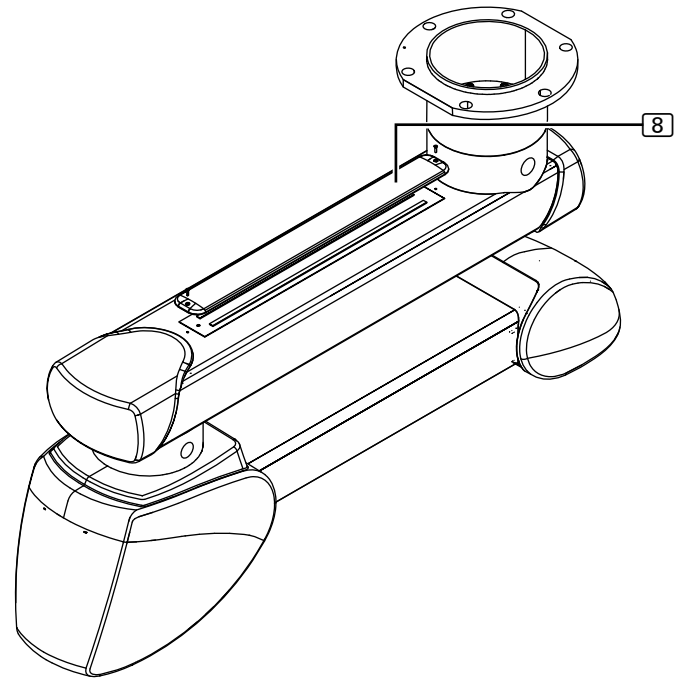
Fixing elements for additional ceiling tube

Pre-assembled components  
Drop tube fixing elements

Drop tube fixing elements mounted to the  
Navigator M6

Figure 5: Scope of delivery of optional accessories

## 1.9 Overview of optional accessories



The Figure illustrates the pendant system Navigator Lift™ 150 / 250 AirPlus.  
The optional accessories for the pendant system Navigator Lift™ 150 / 250 Friction are identical.

See "Figure 5: on Page 16"

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

### 1.10 Scope of delivery of optional accessories

⑧ Indirect extension arm lighting (extension arm lengths 800, 1000mm)

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

### 1.11 Further optional accessories

- 1 telescopic magnetic pick-up tool set

Approved Nuvo products

Read 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 as described in Chapter 19, "Electromagnetic Compatibility (EMC) Information", on Page 93

## 2.2 Combination with products of other manufacturers

- The pendant system is combined with the Navigator M6. To prevent dangerous overload, which can lead to a failure or collapse of the pendant system, the maximum load bearing capacity specified in Chapter 18, "Technical Data", on Page 91 must be adhered to.
- The party placing the device 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, refer to the Installation Instructions of the Navigator M6 (Part 3: Installing the Navigator M6).
- Power packs intended for the supply of end devices must ensure electrical isolation and provide 2 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 device.

## 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 23).



Danger of fire: warns of the improper use of oxygen (see Chapter 2.11, "Proper use of oxygen", on Page 23).



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.



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

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



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 device 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).



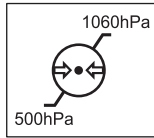
CE mark: Nuvo declares that the products comply with the relevant regulations set forth in the applicable European Directives.



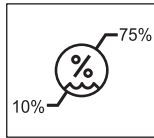
CE mark with the ID number of the conformity assessment body indicated: Nuvo declares that the assessment of conformity in accordance with 93/42 EEC (Medical Device Directive) has been performed by the body indicated.



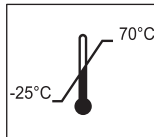
This symbol marks the product as a component approved by a "Nationally Recognized Testing Laboratory" which complies with both Canadian and US deviations from applicable standards.



Atmospheric pressure: indicates the permissible atmospheric pressure values in a range from 500 hPa to 1060 hPa 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™ 150 AirPlus Single, Navigator Lift™ 250 AirPlus Single, Navigator Lift™ 150 AirPlus Dual, Navigator Lift™ 150 Friction Single, Navigator Lift™ 150 Friction Dual, Navigator Lift™ 250 Friction Single
- 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 conveyance and extraction of e.g.:
    - 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 91 must not be exceeded.
- The maximum duty cycle of the height adjustment mechanism on the motor arm must not exceed 3 minutes:
  - If the height adjustment mechanism is actuated over a longer period of time, the electric motor of the motor arm may switch off automatically as a protection measure against overheating.
  - In order to prevent an overload of the electric motor, make sure you wait at least 30 minutes after actuating the height adjustment mechanism before putting the height adjustment mechanism back into operation. Afterwards the height adjustment mechanism can be operated once again for 3 minutes.
- The maximum duty cycle of the electropneumatic brakes must not exceed 3 minutes:

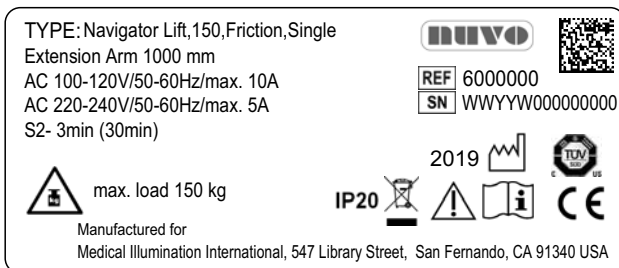
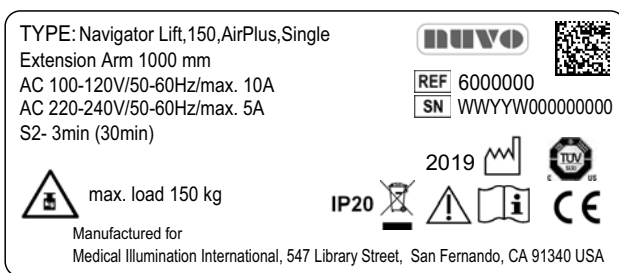
Duty cycle of the height adjustment mechanism

Duty cycle of the electropneumatic brakes

### 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.

Figure 6: 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 – 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 – 40 °C
  - Relative humidity: 30 % to 75 %
  - Atmospheric pressure: 700 hPa to 1,060 hPa
- This corresponds to a maximum operating altitude of 3,000 m.

## 2.8 Information on the Rating Plate

(See "Figure 6")

- The rating plates are attached to the top side of the extension arm and under the front cover of the motor arm.
- Navigator Lift™ 150 / 250 AirPlus is the version equipped with pneumatic (compressed air operated) brakes.
- Navigator Lift™ 150 / 250 Friction is the version equipped with a mechanical brake.

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.

S2-3min (30min) duty cycle of the height adjustment mechanism

- See Chapter 18, "Technical Data", on Page 91.

Load bearing capacity

- "Max. load" indicates the maximum permissible load bearing capacity of the motor arm:
  - The max. load of the Navigator Lift™ 150 is 150kg
  - The max. load of the Navigator Lift™ 250 is 250kg

Date of manufacture

- The digits 1 to 4 of the serial number (SN) indicate the date of manufacture of the pendant system.
  - The first 2 digits indicate the week of manufacture, e.g. 14 = calendar week 14.
  - The following 2 digits indicate the year of manufacture, e.g. 15 = 2015.
  - The letter in the 5<sup>th</sup> 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 energized 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 the poles from the mains and prevent the device from being inadvertently switched back on again.
- Check whether the device is de-energised.
- Cover and shield any adjacent energised parts.

### ⚠ WARNING



#### Pendant system dropping

The tightening torques are indicated 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, motor arm, adaptations and end devices.

## 2.11 Proper use of oxygen

### DANGER



#### Oxygen explosion

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

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



#### Danger of fire

Escaping oxygen is highly combustible:

- Open fires, red hot objects and naked flames are not permitted when working with oxygen!
- Do not smoke!

## 2.12 Warranty

### WARNING



#### Pendant system dropping

The pendant system and 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:

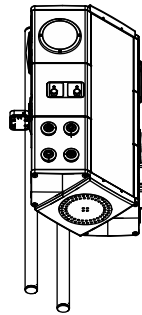
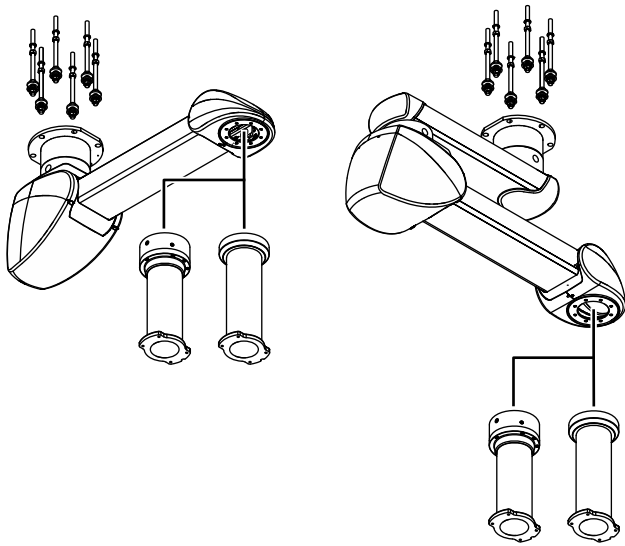
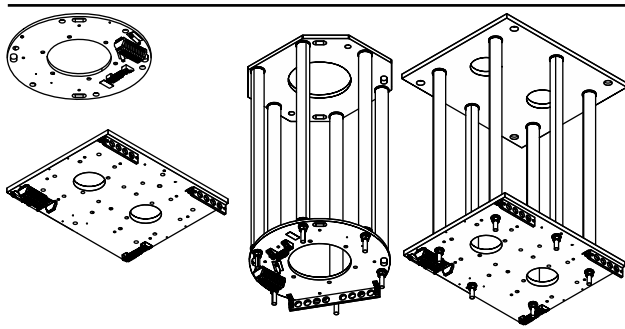
- No structural alterations are made to the pendant system. Unauthorised modifications or conversions to the pendant system are not permitted for safety reasons.
- Only genuine spare parts or accessories and those defined and approved by Nuvo are used. The use of other parts may involve unknown risks 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 device 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

RoHS conformity

- The pendant system complies with the requirements of the 2011/65/EU 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 7: Overview of the structure of these Installation Instructions



The Installation Instructions for the entire ceiling support 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 Navigator Lift™ 150 / 250 AirPlus
- (Navigator Lift™ 150 / 250 Friction not illustrated)

- Part 03: Navigator M6

- Lifting device or forklift with a permitted payload of at least 250 kg.  
Alternatively, a hoisting winch with a permissible payload of at least 250 kg can be used if space is limited:
  - Check that the pendant system is sufficiently secured before lifting it.
  - During the lifting motion, make sure you avoid collisions with other pendant systems, devices, ceilings or walls and other assemblies.
- Protective gloves
- Digital spirit level
- Torque wrench
- Multimeter
- Standard tool kit
- Spanner wrench, size 36
- 1 telescopic magnetic pick-up tool set
- Working platform (e.g. platform ladder) in accordance with country-specific occupational health and safety regulations

Figure 8: Load data of the Single version  
(Navigator Lift™ 250 AirPlus with Navigator™)

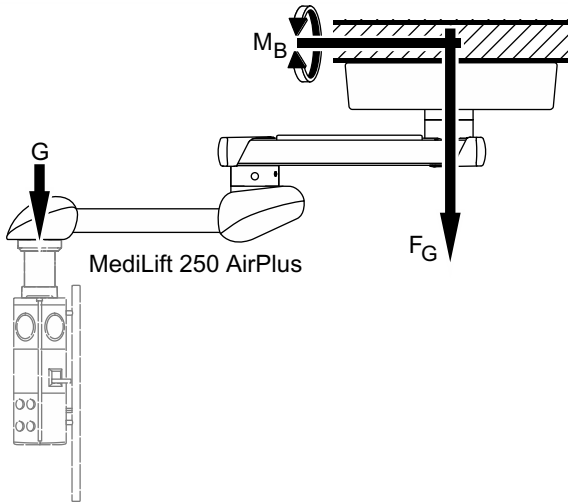
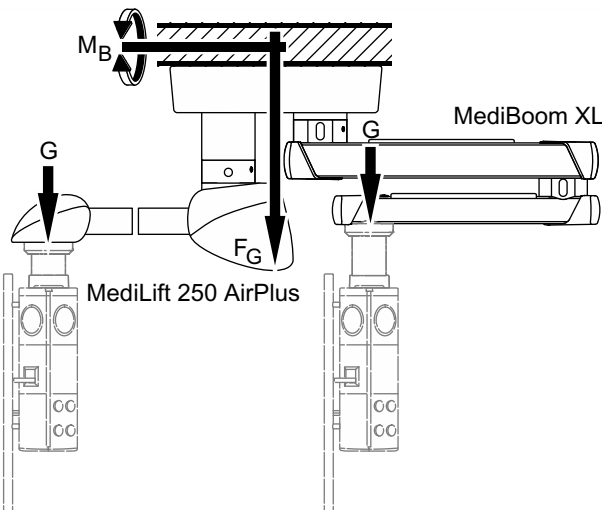


Table 01: Load data of the Navigator Lift™ 150 / 250 AirPlus

Navigator Lift™ 150 AirPlus (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
Motor arm 1015mm	2195	1300	1550	150
Navigator Lift™ 250 AirPlus (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
Motor arm 1015mm	3176	1300	2550	250
Navigator Lift™ 250 AirPlus (Dual / Dual arm versions)	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 / Motor arm 1015mm	2387	1300	2800	150
Extension arm 800mm / Motor arm 1015mm	2417	1300	3250	150
Extension arm 1000mm / Motor arm 1015mm	2446	1300	3700	150

Figure 9: Load data for support arm combinations  
(Navigator Lift™ 250 AirPlus / Navigator™ XL)



## 5.1 Load data of the Navigator Lift™ 150 / 250 AirPlus

### 5.1.1 Load data of the Single version

(See "Figure 8")

The data required for calculating the ceiling load is indicated in the table 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 value 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 Dual 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!

## 5.2 Load data for support arm combinations

(See "Figure 9")

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

Example:

Navigator Lift™ 250 AirPlus (motor arm 1015mm) on the intermediate ceiling set combined with

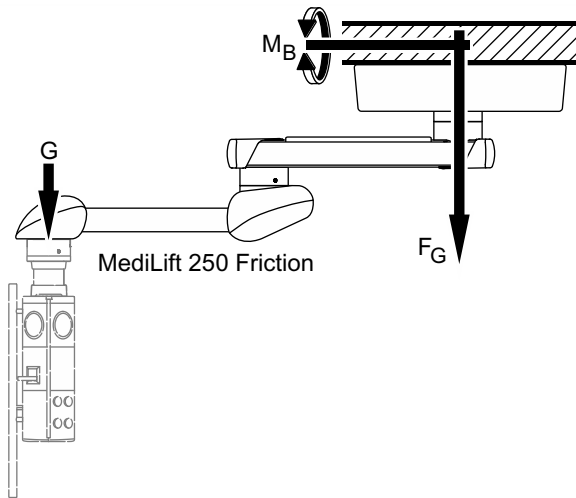
Navigator™ XL (extension arm 1200/1000mm).

Sum of weight forces:  $3176\text{N} + 3599\text{N} + 1300\text{N} = 8075\text{N}$

Sum of bending moments:  $2550\text{Nm} + 6502\text{Nm} = 9052\text{Nm}$

For the load data of the pendant system Navigator Lift™ 150 / 250 AirPlus combined with the pendant system, e.g. Navigator™ XL, refer to the corresponding Installation Instructions.

Figure 10: Load data of the Single version  
(Navigator Lift™ 250 Friction with Navigator™)



## 5.3 Load data of the Navigator Lift™ 150 / 250 Friction

### 5.3.1 Load data of the Single version

(See "Figure 10")

The data required for calculating the ceiling load is indicated in the table 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 value 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 Dual version can be added.

#### ⚠ WARNING



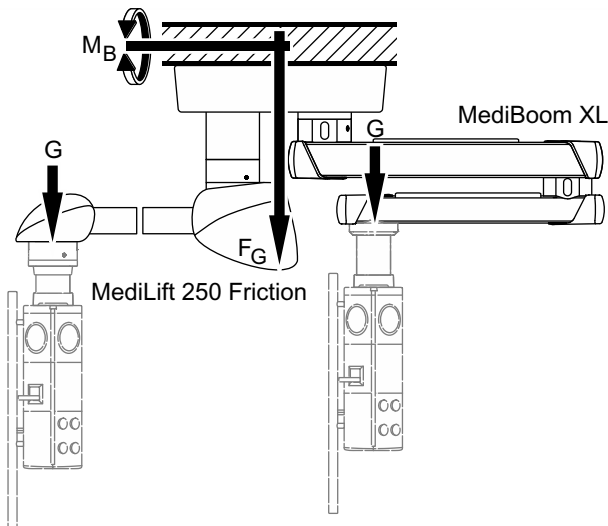
#### Pendant system dropping

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

Table 02: Load data of the Navigator Lift™ 150 / 250 Friction

Navigator Lift™ 150 Friction (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
Motor arm 1015mm	2195	1300	1550	150
Navigator Lift™ 250 Friction (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
Motor arm 1015mm	3176	1300	2550	250
Navigator Lift™ 150 Friction (Dual / Dual arm versions)	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 / Motor arm 1015mm	2387	1300	2800	150
Extension arm 800mm / Motor arm 1015mm	2417	1300	3250	150
Extension arm 1000mm / Motor arm 1015mm	2446	1300	3700	150

Figure 11: Load data for support arm combinations  
(Navigator Lift™ 250 Friction / Navigator™ XL)



## 5.4 Load data for support arm combinations

(See "Figure 11")

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

Example:

Navigator Lift™ 250 Friction (motor arm 1015mm) on the intermediate ceiling set combined with

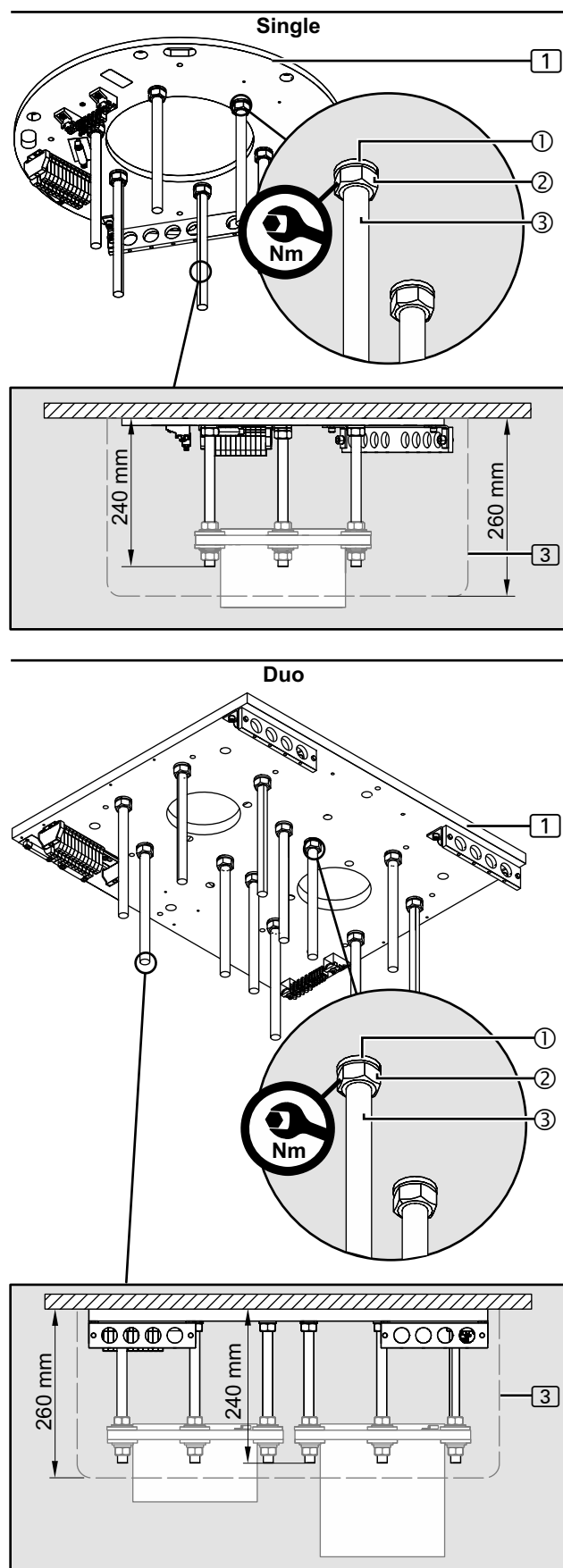
Navigator™ XL (extension arm 1200/1000mm).

Sum of weight forces:  $3176\text{N} + 3599\text{N} + 1300\text{N} = 8075\text{N}$

Sum of bending moments:  $2550\text{Nm} + 6502\text{Nm} = 9052\text{Nm}$

Navigator Lift™ 150 / 250 AirPlus combined with pendant system Navigator Lift™ 250 Friction combined with the pendant system, e.g. Navigator™ XL, refer to the corresponding Installation Instructions.

Figure 12: Cutting and installing the threaded bolts for the Single / Dual interface plate on the raw ceiling



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

### 6.1.1 Versions

(See "Figure 12")

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

The steps required for installation on the interface plate **1** Single (squared shape) are identical.

### 6.1.2 Cutting the threaded bolts to length

(See "Figure 12")

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

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

1. For the canopy **3** which is 260mm high the 6/12 threaded bolts M16 x 330mm **3** must be cut to 240mm.
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 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.



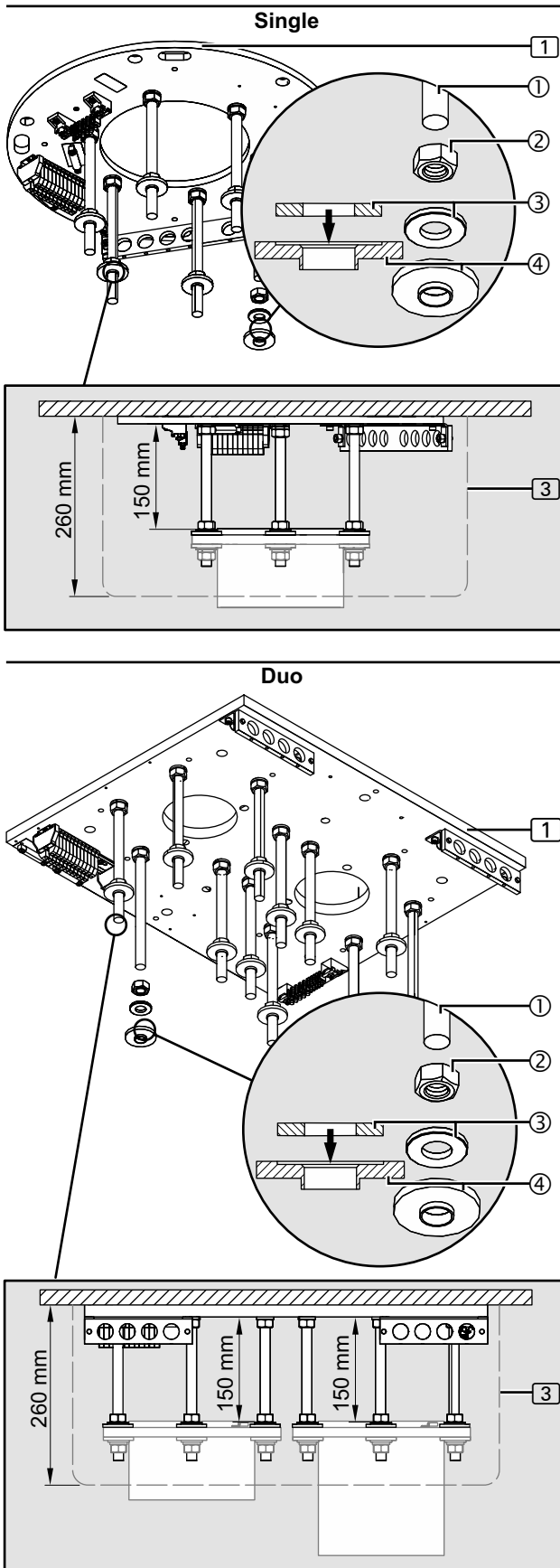
### Pendant system dropping

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 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 13: Mounting the upper insulations to the threaded bolts



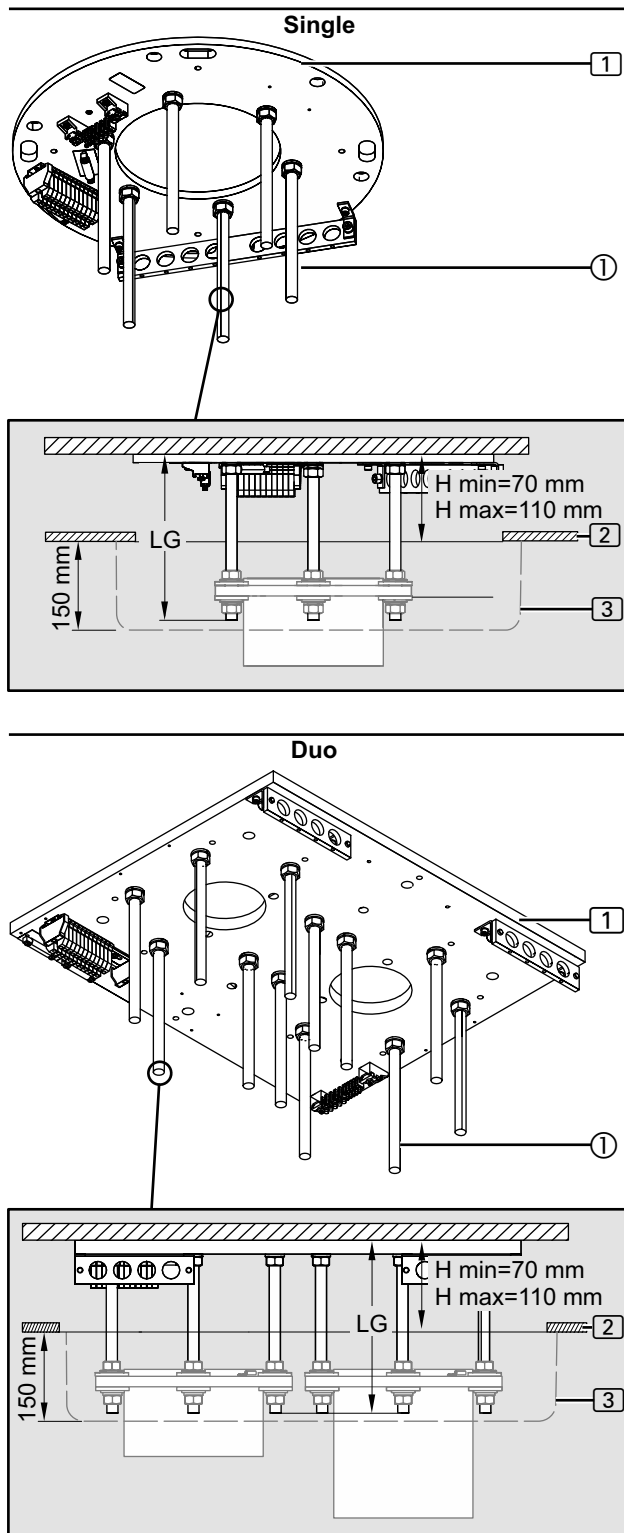
#### 6.1.4 Mounting the upper insulations to the threaded bolts

(See "Figure 13")

The 6 (Single version) or 12 (Dual 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 <sup>①</sup> to 150 mm.
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 14: Cutting the threaded bolts for the Single / Dual 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 14")

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

The steps required for installation on the interface plate **1** Single (squared shape) are identical.

### 6.2.2 Cutting the threaded bolts to length

(See "Figure 14")

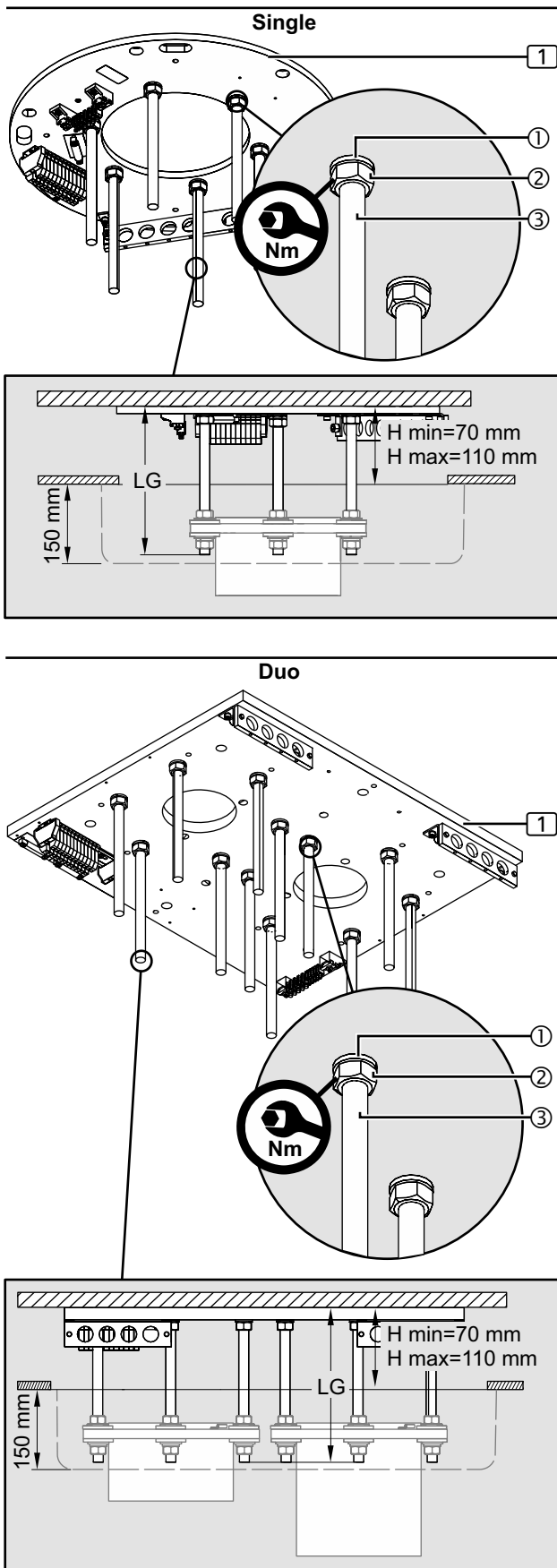
If a Single / Dual interface plate **1** is mounted to the raw ceiling with intermediate ceiling **2**, the 6 (Single version) or 12 (Dual version) threaded bolts M16 x 330mm **1** must be cut to length.

The Single / Dual 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, Dual 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 in any doubt.
  2. Slightly deburr 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 15: Mounting the upper insulations to the threaded bolts



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

(See "Figure 15")

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.



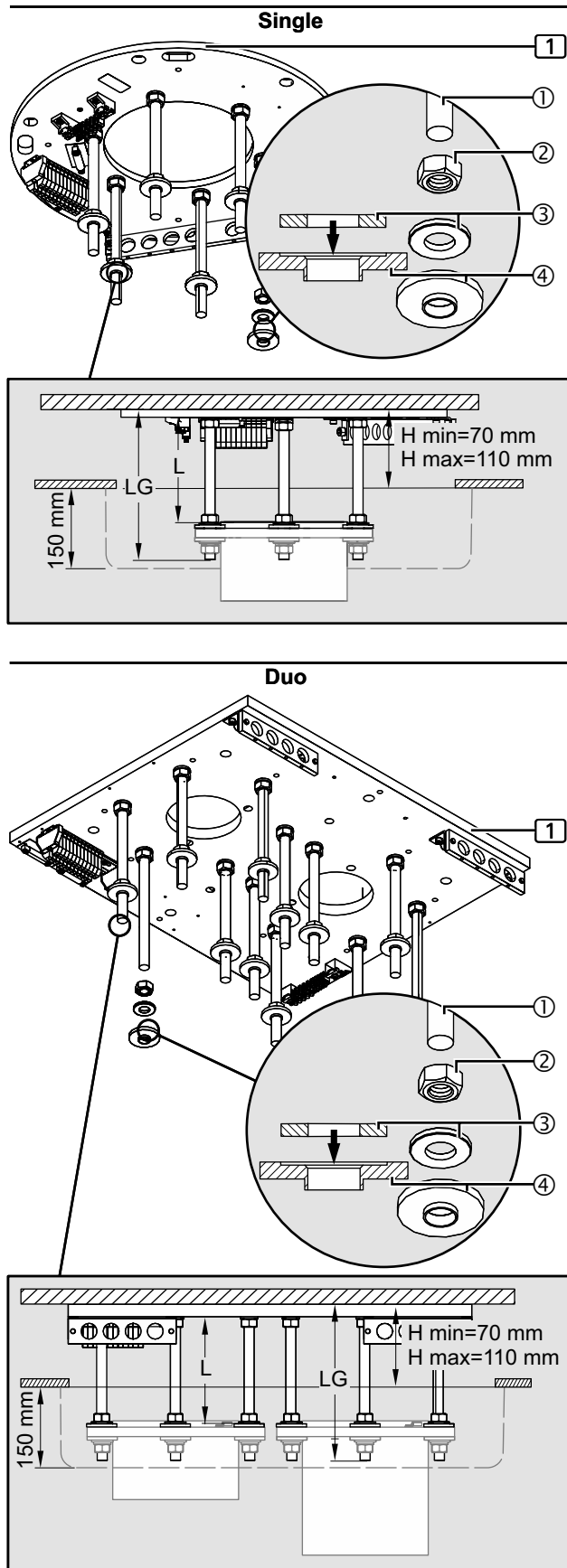
#### Pendant system dropping

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 16: Mounting the upper insulations to the threaded bolts

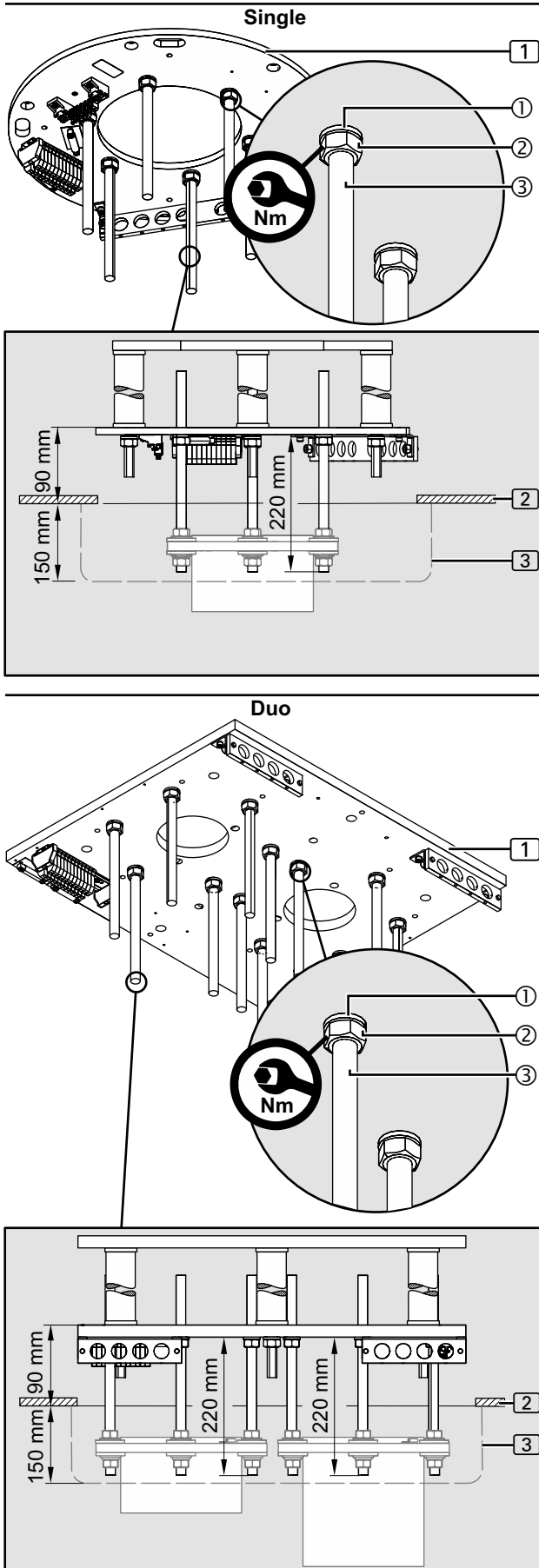


#### 6.2.4 Mounting the upper insulations to the threaded bolts

(See "Figure 16")

1. For each threaded bolt M16 ① screw a hexagonal nut M16 ② onto the threaded bolts M16 ① .
2. Adjust the distance between the hexagonal nuts M16 ② and the interface plate ①:  
  - $L = LG - 95\text{mm}$  (min. 110 mm / 150 mm)
3. Screw the hexagonal nuts M16 ② onto the threaded bolts M16 ① at the calculated distance L.
4. Using a digital spirit level, align the hexagonal nuts M16 ② in a horizontal position.
5. Place 1 flat washer with an external diameter of 34 mm ③ .
6. Place 1 plastic insulating disc ④ (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 ④ .
7. Using an adhesive or elastic tape, attach the plastic insulating disc ④ to the threaded bolts M16 ① .
8. Continue the installation as described in Chapter 7, on Page 35 or Chapter 8, on Page 39.

Figure 17: Mounting the threaded bolts



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

### 6.3.1 Versions

(See "Figure 17")

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

The steps required for installation of the interface plate ① Single (squared shape) are identical.

### 6.3.2 Mounting the threaded bolts

(See "Figure 17")

The 6 (Single version) or 12 (Dual version) threaded bolts M16 x 330mm③ must protrude from the interface plate ①.

The Single / Dual 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 M16③ must not exceed a maximum length of 330mm.

1. Screw 1 hexagonal nut M16② each onto the 6/12 threaded bolts M16 x 330mm③ and then place 1 spring ring ① each.
2. All threaded bolts M16 x 330mm③ must be completely screwed into the interface plate ①.  
The threaded bolts M16 x 330mm③ for the:
  - Single version = 220 mm
  - Dual version = 220 mm
 must protrude from the interface plate ①.

#### ⚠ WARNING

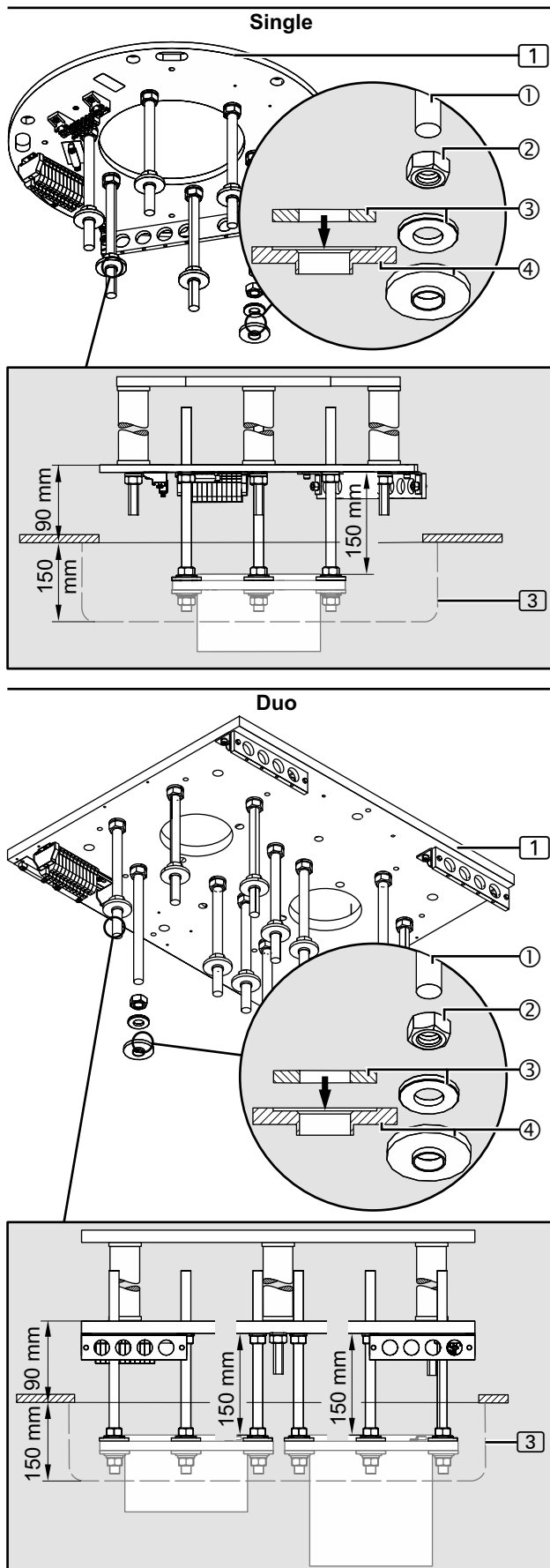


#### Pendant system dropping

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

- Tighten all hexagonal nuts M16② with a tightening torque of 195Nm.
3. Check that the threaded bolts M16 x 330mm③ are securely in place at the correct distances.
    - For the Single and Dual version 195mm the threaded bolts M16 x 330mm③ must protrude from the interface plate ①.
    - The 6/12 hexagonal nuts M16② must be tightened to 195Nm.
  4. Continue the installation as described in Chapter 6.3.3, on Page 34.

Figure 18: Mounting the upper insulations to the threaded bolts



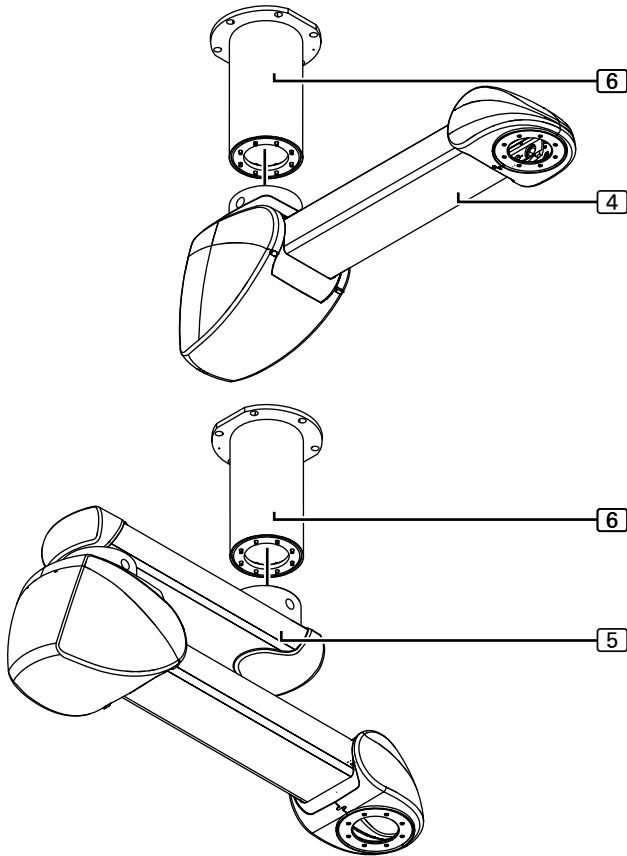
### 6.3.3 Mounting the upper insulations to the threaded bolts

(See "Figure 18")

The 6 (Single version) or 12 (Dual version) hexagonal nuts M16② must be mounted to the threaded bolts M16 x 330mm① at an exact distance to each other.

1. For each threaded bolt M16 x 330mm① screw a hexagonal nut M16② onto the threaded bolts M16 x 330mm① .
2. Adjust the distance between the hexagonal nuts M16② and the interface plate ①:
  - The distance between the hexagonal nuts M16② and the interface plate ① must be 150mm.
3. Using a digital spirit level, align the hexagonal nuts M16② in a horizontal position.
4. Place 1 flat washer with an external diameter of 34mm③ .
5. Place 1 plastic insulating disc④ (as illustrated in the Figure) in such a way that the flat washer with an external diameter of 34mm③ (see arrow in the detailed representation in the Figure) sits in the plastic insulating disc④ .
  - Using an adhesive or elastic tape, attach the plastic insulating disc④ to the threaded bolts M16① .
6. Continue the installation as described in Chapter 7, on Page 35 or Chapter 8, on Page 39.

Figure 19: Components described in this chapter

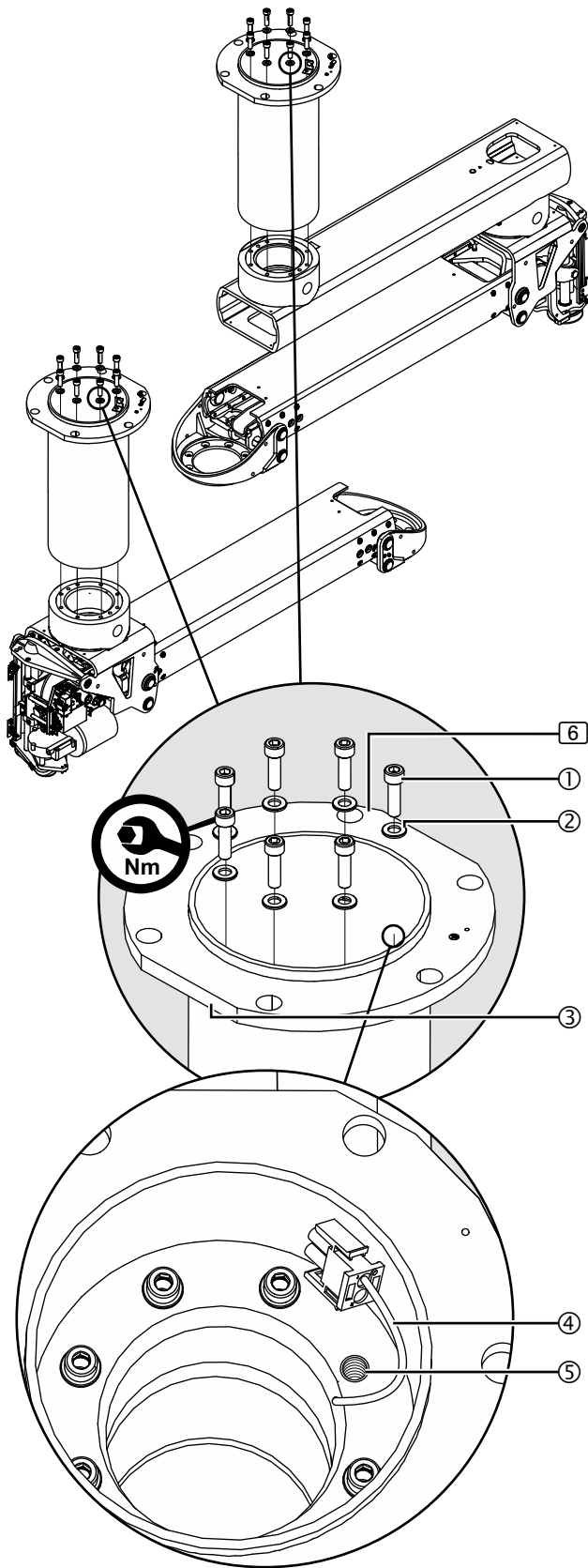


## 7.1 Components described in this chapter

(See "Figure 19")

- The ceiling tube [6] illustrated in the Figure is mounted to the motor arm [4] or the extension arm with motor arm [5].
- The Figure shows a simplified representation with only the motor arm [4] or the extension arm with motor arm [5] without pre-assembled cables.
- The Figure illustrates the pendant system Navigator Lift™ 150 / 250 Air Plus.  
The steps required for installing the Navigator Lift™ 150 / 250 Friction variant are identical.

Figure 20: Mounting the ceiling tube



## 7.2 Mounting an extended ceiling tube

### 7.2.1 Mounting the ceiling tube

(See "Figure 20")

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

1. Place the ceiling tube [6] onto the motor arm [4] or extension arm with motor arm [5] and position it in such a way that the chamfered surface [3] is almost at right angles to the motor arm [4] or the extension arm with motor 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. Fit 8 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 with 8 lock washers [2].
  3. At the position of the pre-assembled cable [4] leave the threaded hole [5] free and do not screw in an Allen cylinder screw M10 x 25mm [1] – 8.8 – DIN EN ISO 4762.
  4. Screw the ceiling tube [6] onto the motor arm [4] or the extension arm with motor arm [5] using 7 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 and lock washers [2].
    - Use an extension tool to tighten the 7 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762.

#### WARNING

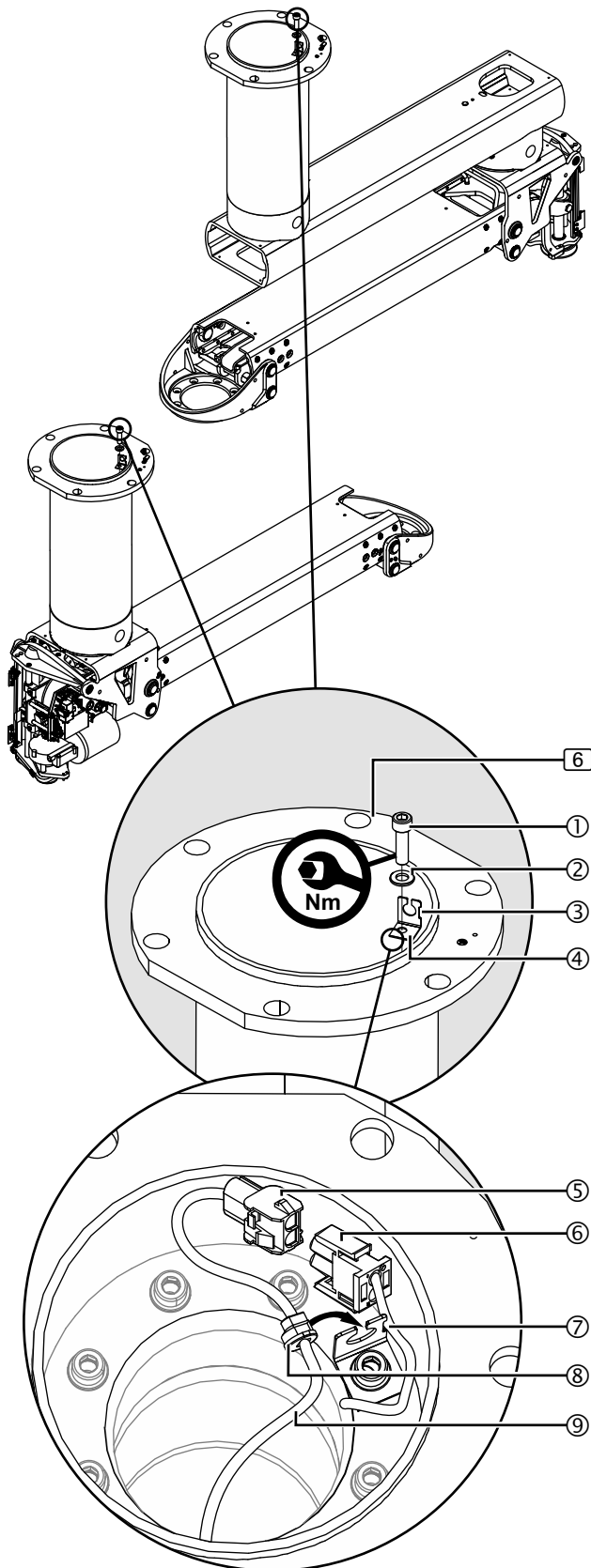


##### Pendant system dropping

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

- Tighten the 7 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 to 40Nm.
5. Check that the motor arm [4] or the extension arm with motor arm [5] is securely in place:
    - The ceiling tube [6] must be level with the motor arm [4] or the extension arm with motor arm [5].
    - The 7 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 must be fitted with lock washers [2].
    - The 7 Allen cylinder screws M10 x 25mm [1] – 8.8 – DIN EN ISO 4762 must be tightened to 40Nm.

Figure 21: Mounting the strain relieving mechanism in the ceiling tube



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

(See "Figure 21")

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

1. Insert an Allen cylinder screw M10 x 25mm ① – 8.8 – DIN EN ISO 4762 and the 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 motor arm [4] or the extension arm with motor arm [5] using the Allen cylinder screw M10 x 25mm ① – 8.8 – DIN EN ISO 4762 and 1 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 motor arm [4] or the extension arm with motor arm [5] towards the distributor board.

### ⚠ WARNING

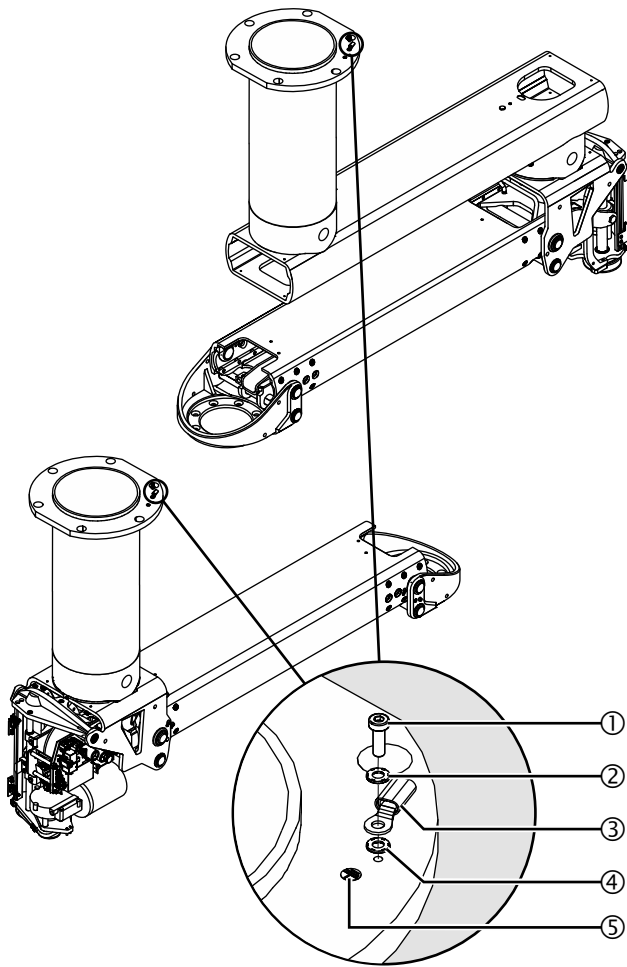


#### Pendant system dropping

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 22: Subsequently mounting the earthing cable to the ceiling tube



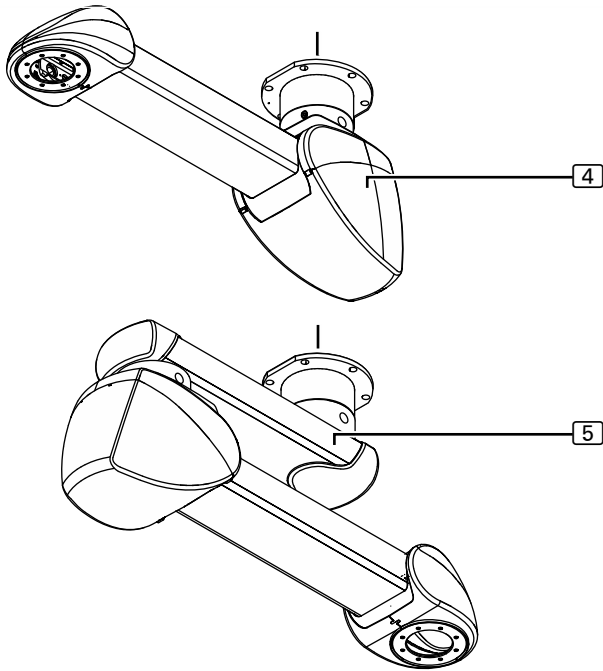
### 7.2.3 Subsequently mounting the earthing cable to the ceiling tube

(See "Figure 22")

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 4 mm<sup>2</sup> (approx. 1 m long) included in the scope of delivery.
2. Using 1 Allen cylinder screw M4 x 12 mm – 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 12 mm ①.
4. Continue the installation as described in Chapter 8, on Page 39.

Figure 23: Components described in this chapter



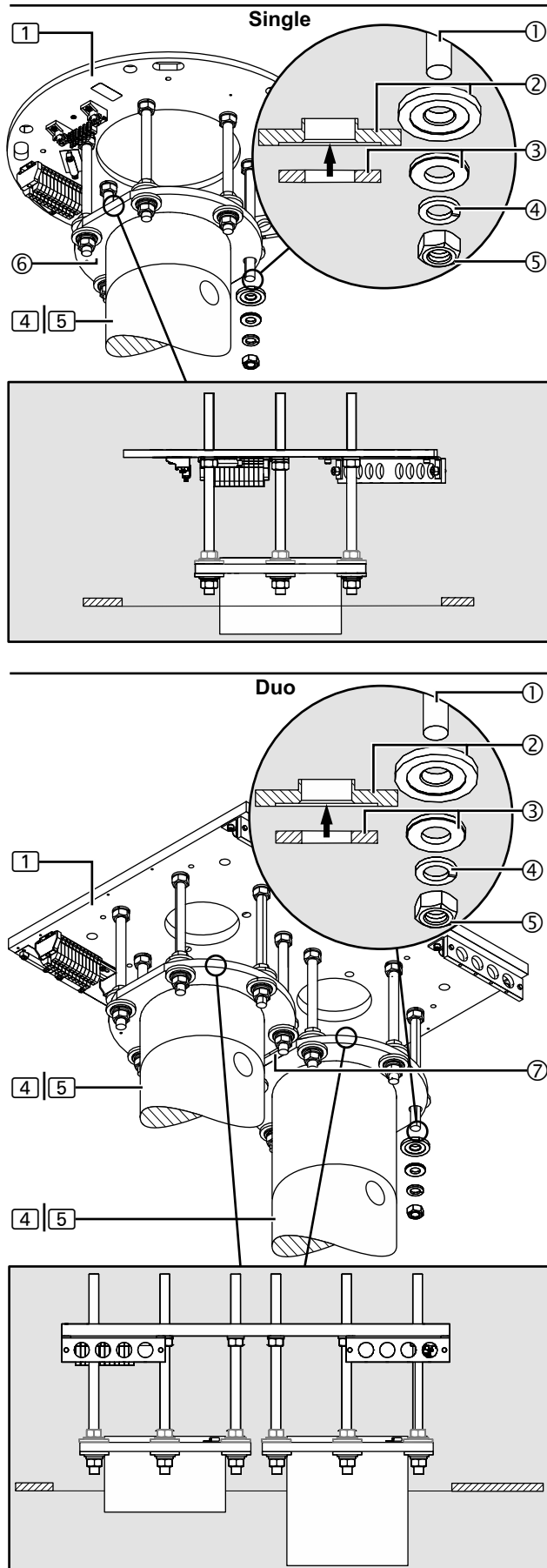
### 8.1 Components described in this chapter

(See "Figure 23")

- The motor arm [4] or the extension arm with motor 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 motor arm [4] or the extension arm with motor arm [5] without cables.
- The Figure illustrates the pendant system Navigator Lift™ 150 / 250 AirPlus.

The steps required for installing the Navigator Lift™ 150 / 250 Friction variant are identical.

Figure 24: Mounting the ceiling tube



## 8.2 Mounting the ceiling tube

(See "Figure 24")

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 motor arm, extension arm, cables, etc. are not represented.

### ⚠ WARNING



**Risk of parts falling off**

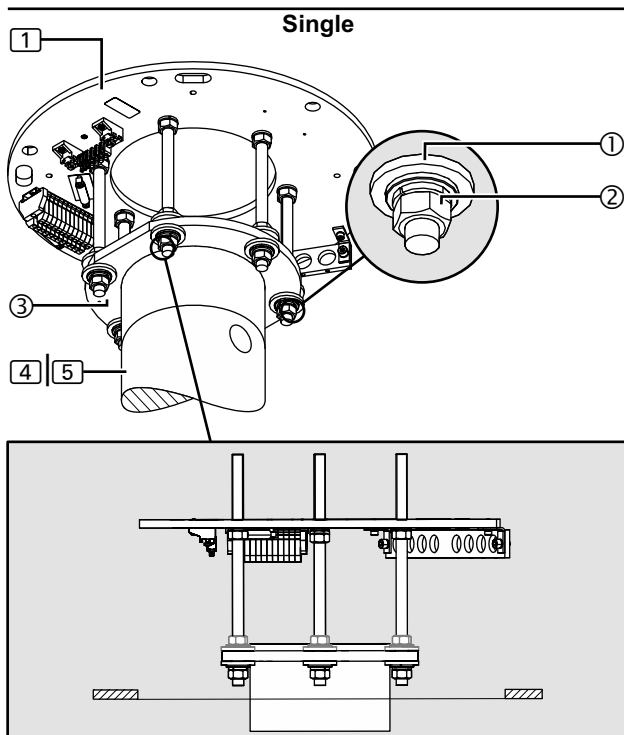
**Make sure that no-one is standing underneath the components of the pendant system.**

1. Securely fasten the flange ⑥ of the ceiling tube with the motor arm ④ or the extension arm with motor 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 of the Dual 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 motor arm ④ or the extension arm with motor 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 Dual version as described in Chapter 8.4, on Page 43.

Figure 25: Aligning the motor arm / extension arm with the interface plate, Single



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

(See "Figure 25")

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 motor 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

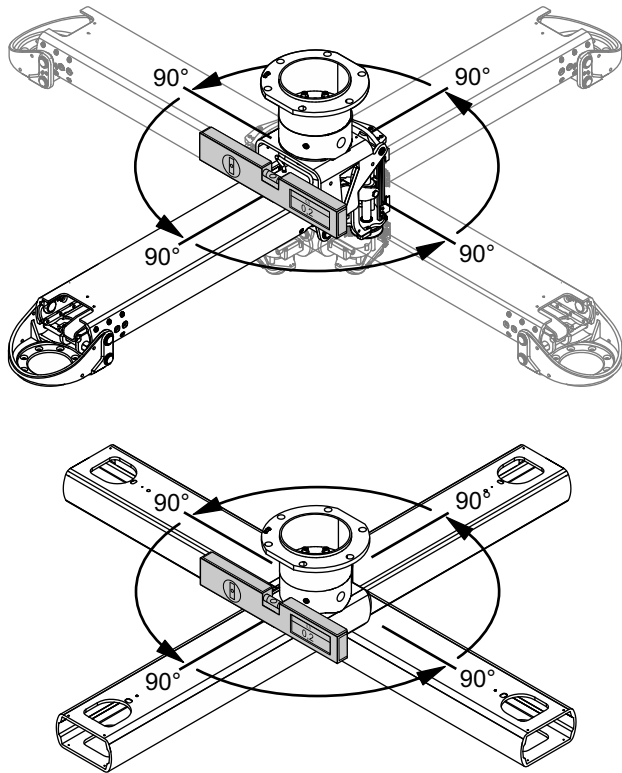
#### Destruction of the cables in the extension arm / motor arm

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

- Do not rotate the motor arm ④ or the extension arm with motor arm ⑤ more than 350 degrees.
- If required, restrict the swivel range of the motor arm ④ or the extension arm with motor arm ⑤ as described in Chapter 15.8, on Page 84.

3. For the extension arm with motor arm ⑤ – Dual arm variant, remove the transport lock (band) and dismantle the pre-assembled swivel stop as described in Chapter 15.8.4, on Page 87 if required. Next, turn the motor arm into the extension of the upper extension arm.
4. Continuation on the next page.

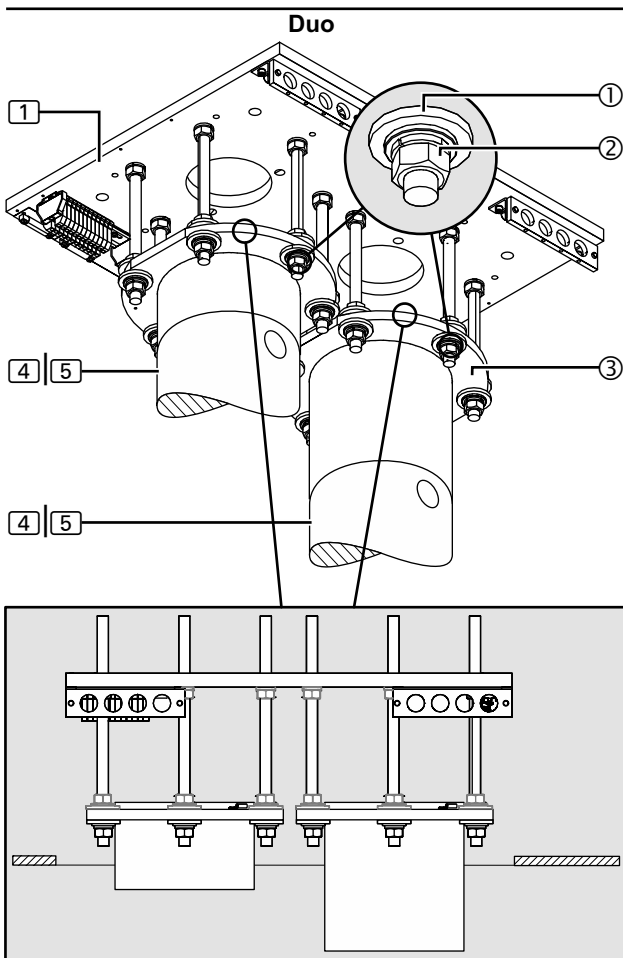
Figure 26: Checking the horizontal alignment of the motor arm / extension arm



(See "Figure 26")

5. Check the horizontal alignment of the motor arm / extension arm.
  - Place the digital spirit level at right angles onto the motor arm or extension arm (near the flange ③).
  - Rotate the motor 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 motor 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 (see "Figure 25: on Page 41"):
  - The 6 hexagonal nuts M16 ② must be level with the flange ③.
  - The 6 plastic insulating discs ① above and below the flange ③ must sit in the flange ③ and must not be damaged.
  - The 6 hexagonal nuts M16 ② must be tightened to 100Nm.

Figure 27: Aligning the motor arm / extension arm with the interface plate, Dual



## 8.4 Aligning the motor arm / extension arm with the interface plate, Dual

(See "Figure 27")

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 motor 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.

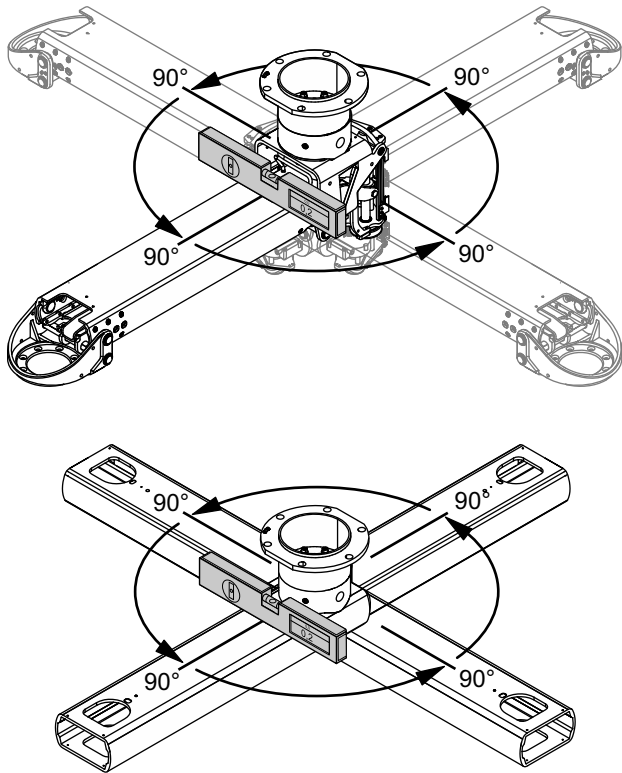
### NOTICE

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

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

- Do not rotate the motor arm ④ or the extension arm with motor arm ⑤ more than 350 degrees.
  - If required, restrict the swivel range of the motor arm ④ or the extension arm with motor arm ⑤ as described in Chapter 15.8, on Page 84.
4. For the extension arm with motor arm ⑤ – Dual arm variant, remove the transport lock (band) and dismantle the pre-assembled swivel stop as described in Chapter 15.8.4, on Page 87 if required. Next, turn the motor arm into the extension of the upper extension arm.
  5. Continuation on the next page.

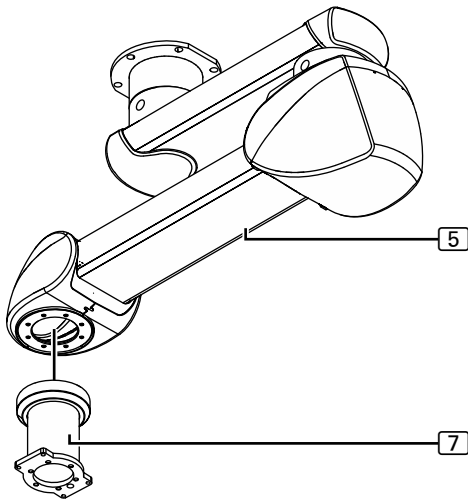
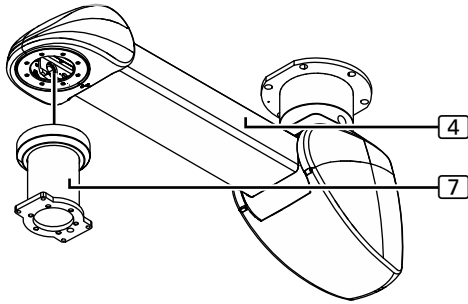
Figure 28: Checking the horizontal alignment of the motor arm / extension arm



(See "Figure 28")

6. Check the horizontal alignment of the motor arm / extension arm.
  - Place the digital spirit level at right angles onto the motor arm or extension arm (near the flange ③).
  - Rotate the motor 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 motor 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 (see "Figure 27: on Page 43"):
  - 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 29: Components described in this chapter

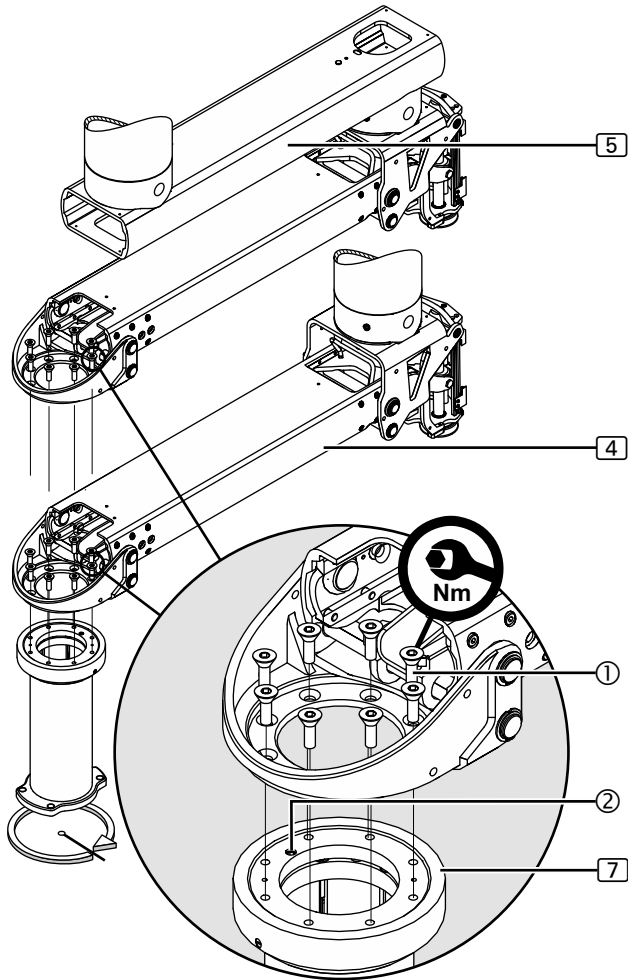


### 9.1 Components described in this chapter

(See "Figure 29")

- The Drop tube [7] with Bearing Unit Friction (slide bearing) illustrated in the Figure is mounted onto the motor arm [4] or extension arm with motor arm [5].
- The steps required for mounting the Drop tube [7] with Bearing Unit Friction (roller bearing) are identical.
- The Figure shows a simplified representation with only the motor arm [4] or the extension arm with motor arm [5] without cables.

Figure 30: Mounting the Drop tube to the motor arm



## 9.2 Mounting the Drop tube to the motor arm

(See "Figure 30")

The Figure shows a magnified sectional view of the extension arm without its top side.

1. Place the Drop tube [7] under the motor arm [4] or the extension arm with motor arm [5] such that the end stop ② in the Drop tube [7] points away from the motor arm and the fixing holes fall in line.

### NOTE – Defining the swivel range

- In order to be able to swivel the Navigator M6 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 to the right (clockwise), the Drop tube must be mounted with the end stop ② on the left-hand side.
2. Screw the Drop tube [7] onto the motor arm using 8 Allen counter-sunk screws M10 x 18mm ① – 10.9 – DIN EN ISO 10642.

### ⚠ WARNING



#### Pendant system dropping

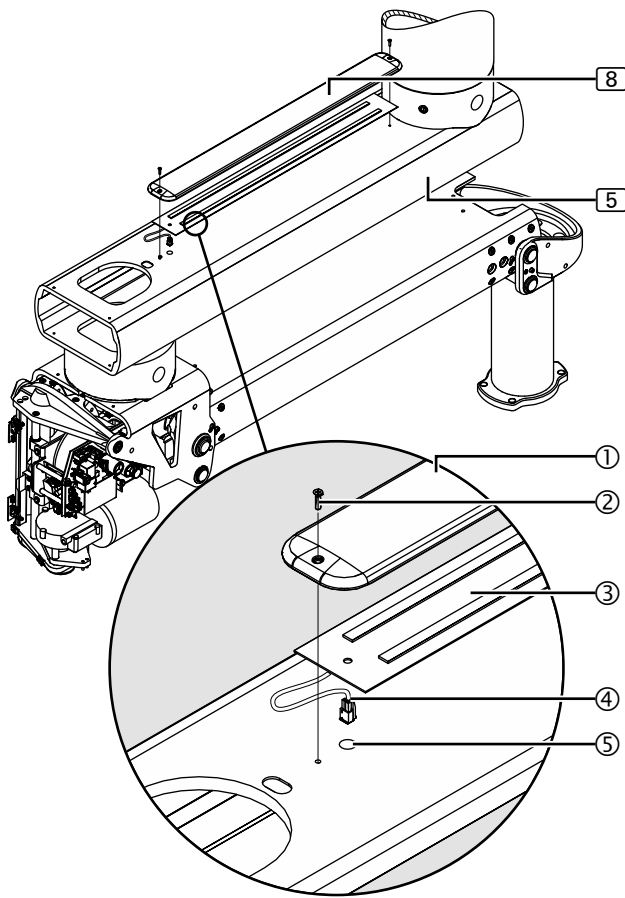
The pendant system can drop if the fixing elements have not been properly tightened:

- Tighten 8 Allen countersunk screws M10 x 18 mm ① – 10.9 – DIN EN ISO 10642 to 40Nm.
3. Check that the Drop tube [7] is securely in place:
    - The Drop tube [7] must be level with the motor arm.
    - The 8 Allen countersunk screws M10 x 18mm ① – 10.9 – DIN EN ISO 10642 must be tightened to 40Nm.

## 9.3 Positioning the Navigator M6 under the Drop tube

1. Position the Navigator M6 under the pendant system as described in the Installation Instructions of the Navigator M6.
  - The supply cables (power and earthing cables, gas and compressed air 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.

Figure 31: Mounting the extension arm lighting



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

(See "Figure 31")

The Figure illustrates the extension arm with motor arm (5) of the Navigator Lift™ 150 / 250 AirPlus system. The steps required for the installation of the pendant systems Navigator Lift™ 150 / 250 Friction are identical.

Upon delivery of the system from the factory the following optional accessories are pre-assembled.

The indirect extension arm lighting (8) (for extension arms from a length of 800mm possible) is mounted to the top side of the extension arm.

The Figure shows a simplified representation with only the extension arm with motor 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 LED (3) through the mounting aperture (5) into the extension arm without bending it.
3. Route the cables through the pendant system and connect them as described in Chapter 11.4.2, on Page 54.
4. Place the cover (1) onto the basic carrier with LED (3) and screw it on using 2 countersunk screws M4 x 16mm (2) – DIN EN ISO 10642.
5. Check that the extension arm lighting (8) is securely in place:
  - The extension arm lighting (8) must be level with the extension arm.
  - The connecting cable (4) on the basic carrier with LED (3) must sit in the extension arm.
  - The 2 countersunk screws M4 x 16mm (2) – DIN EN ISO 10642 must be screwed on.

## 11.1 Safety instructions

### WARNING



#### Electric shock hazard

Power cables may have been laid in the pendant system. Contact with energized 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:

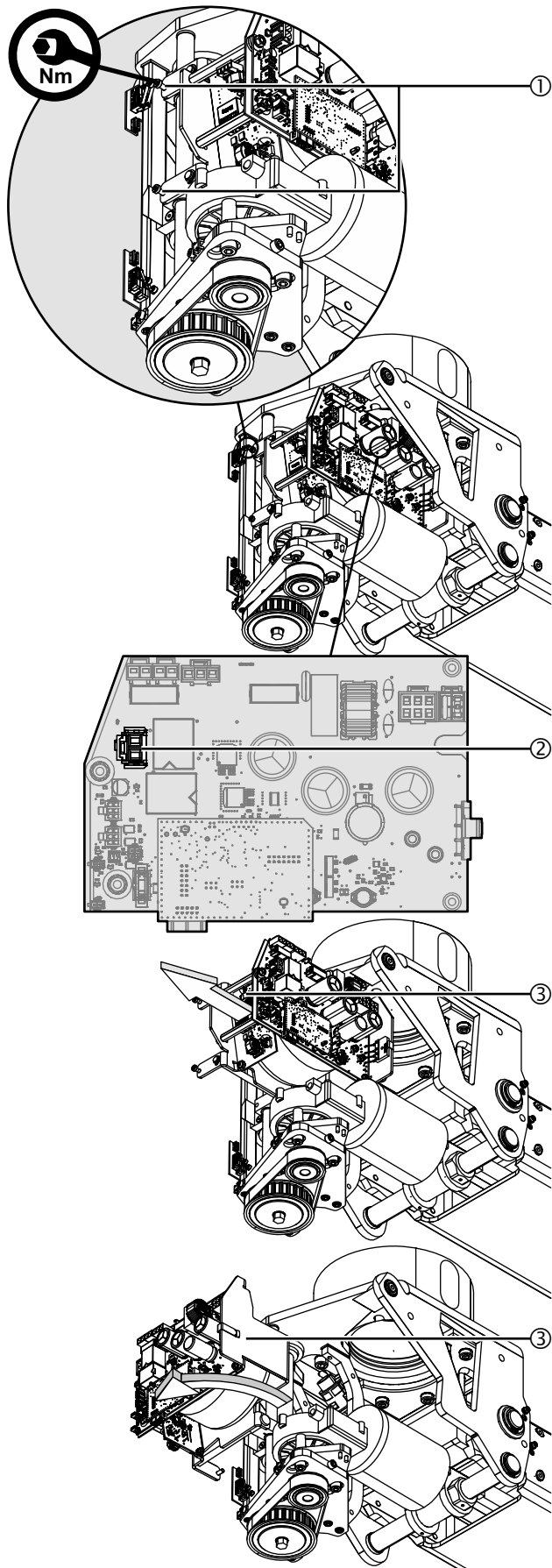
- Disconnect all the poles from the mains and prevent the device from being inadvertently switched back on again.
- Check whether the pendant system is de-energised.
- Cover and shield any adjacent energised parts.

#### 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 you 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).

Figure 32: Swinging out / retracting the electronic unit



## 11.2 Swinging out / retracting the electronic unit

The electronic unit can be swung out for easier cable installation.

The procedure is identical for all versions.

The Figure shows a simplified representation with only the flange with ceiling tube. Other pre-assembled components are not illustrated.

### 11.2.1 Swinging out the electronic unit

(See "Figure 32")

1. Remove the motor cable from the main board at position ② .
2. Loosen the 2 cylinder screws M4 x 25mm ① – 8.8 – DIN 691 using an Allen key (size 3mm).
3. Remove the electronic unit ③ slowly and gently and make sure that pre-assembled cables and plugs are not damaged.
4. Swivel the electronic unit ③ slowly and gently 90 degrees.
5. Install the cables as described in the following chapters.

### 11.2.2 Retracting the electronic unit

(See "Figure 32")

1. Swivel the electronic unit ③ slowly and gently 90 degrees.
2. Push the electronic unit ③ slowly and gently into the motor arm.
  - Make sure that the plate of the electronic unit ③ is flush with the black rubber stop (not illustrated in the Figure).

### NOTICE



#### Risk of damage to the electronic unit

The electronic unit can become unusable if the fixing elements have not been properly tightened:

- Tighten the 2 cylinder screws M4 x 25mm ① – 8.8 – DIN 691 to 3Nm using an Allen key (size 3mm).
3. Check that the electronic unit ③ is securely in place:
    - The plate of the electronic unit ③ must be flush with the black rubber stop (not illustrated in the Figure),
    - the 2 cylinder screws M4 x 25mm ① – 8.8 – DIN 691 must be tightened to 3Nm,
    - the electronic unit ③ is locked in position in the motor arm and can no longer be retracted.

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

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

#### 11.3.1 Connecting the motor and the end switch of the height adjustment mechanism

(See "Figure 33")

2. Plug the cable plug ② onto the corresponding main board socket ① as illustrated in the Figure.
3. Plug the cable plug ③ onto the corresponding main board socket ① as illustrated in the Figure.

#### 11.3.2 Connecting the control cable of the brakes and the height adjustment mechanism

(See "Figure 33")

4. Establish the assembly connection ⑤ between the control cable ④ routed out of the Navigator M6 and the control cable ⑥ .
5. Route the control cable ⑥ in the protective tube through the bow ⑦ , mount the strain relieving mechanism ⑦ and plug the cable plug onto the corresponding main board socket ① as illustrated in the Figure.

#### 11.3.3 Mounting the power cable

(See "Figure 33")

6. Plug the power cable plug ⑧ onto the corresponding main board socket ① and route the cable through the extension arm towards the interface plate.
  - If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 33: Connecting the cables to the extension arm with motor arm Dual arm, with Navigator M6

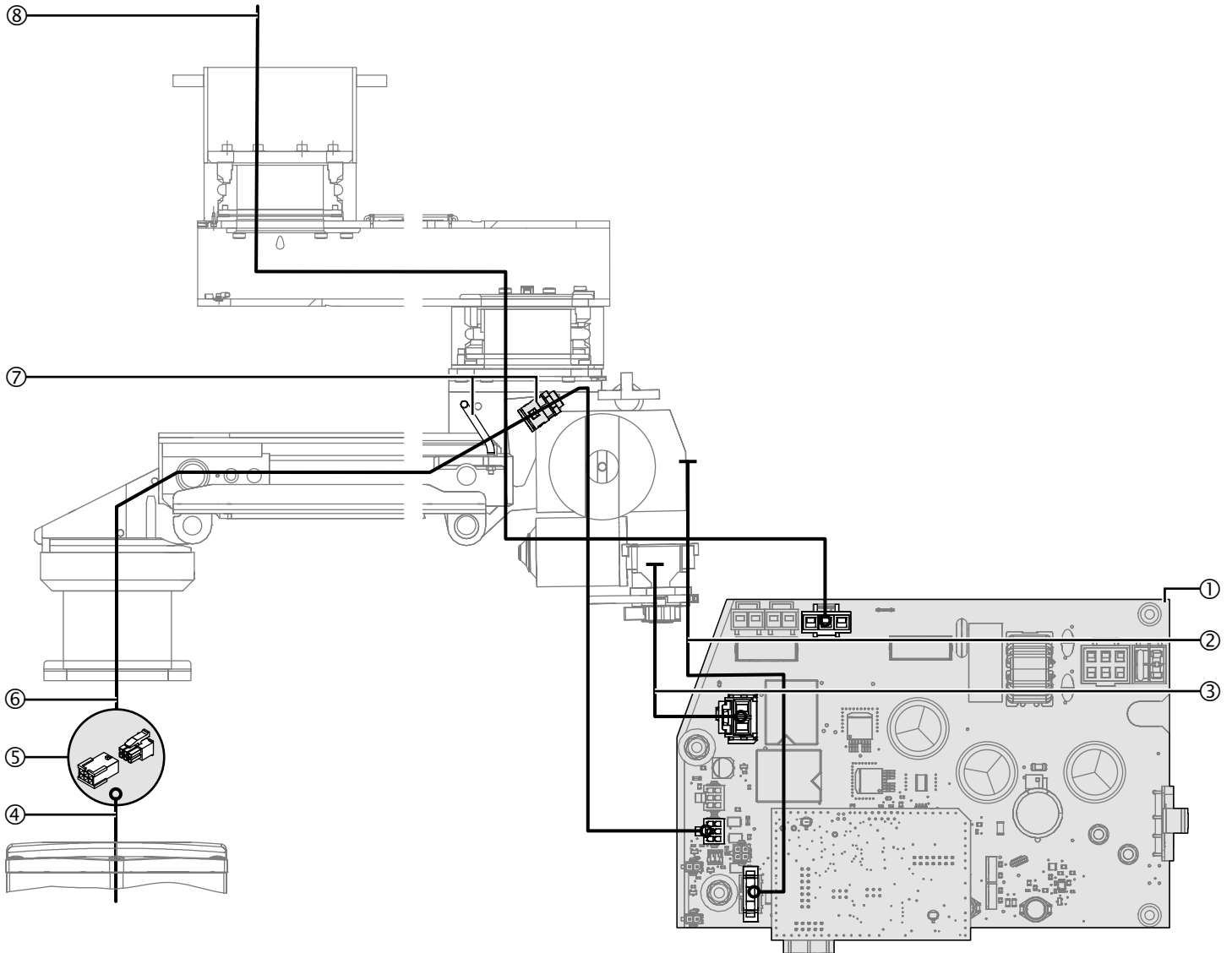


Table 03: Cable assignment: extension arm with motor arm Dual arm, with Navigator M6

No. in Fig. 33	From	To	Designation	Length [mm]	Remark
②	End switch	Main board	End switch board		Pre-assembled
③	Motor	Main board	Motor connecting cable	-	integrated into the motor
④	Navigator M6	Assembly connection ⑩	Navigator M6/Navigator M6 socket interface cable	-	Integrated into the Navigator M6
⑥	Assembly connection ⑤	Main board	Control cable	-	Pre-assembled
⑧	Mains connection	Main board	Mains cable	4000	-

### 11.3.4 Connecting the pneumatic brake pipes

(See "Figure 34")

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

The pneumatic brake pipes are pre-assembled in the pendant system and plugged onto the brake connecting points **1** and **2**. The brake pipes are laid in a spiral coiled tube if required.

#### **NOTE – Installing and disengaging brake pipes**

The pneumatic supply pipe must not be under pressure:

- To install the brake pipes, push them into the brake connecting point. If the brake pipe is correctly positioned, it can no longer be withdrawn from the brake connecting point.
  - To disengage the brake pipes on the plug connector, push in the unlocking mechanism and then remove the brake pipes.
2. Route the brake pipe **2** (BLUE marking) from the pneumatic unit **1** towards the brake connecting point **2** and plug it on.
  3. Route the brake pipe **3** (GREEN marking) from the pneumatic unit **1** towards the brake connecting point **1** and plug it on.
  4. Route the air supply hose **4** (BLACK marking) from the pneumatic unit **1** towards the compressed air outlet at the installation site and connect it.

### 11.3.5 Connecting the cables between the pneumatic unit and the main board

(See "Figure 34")

5. Route the cable plug **5** from the pneumatic unit **1** towards the main board **7** and plug it into the corresponding socket.
6. Route the cable plug **6** from the pneumatic unit **1** towards the main board **7** and plug it into the corresponding socket.

Figure 34: Connecting the cables to the extension arm with motor arm Dual arm, with Navigator M6

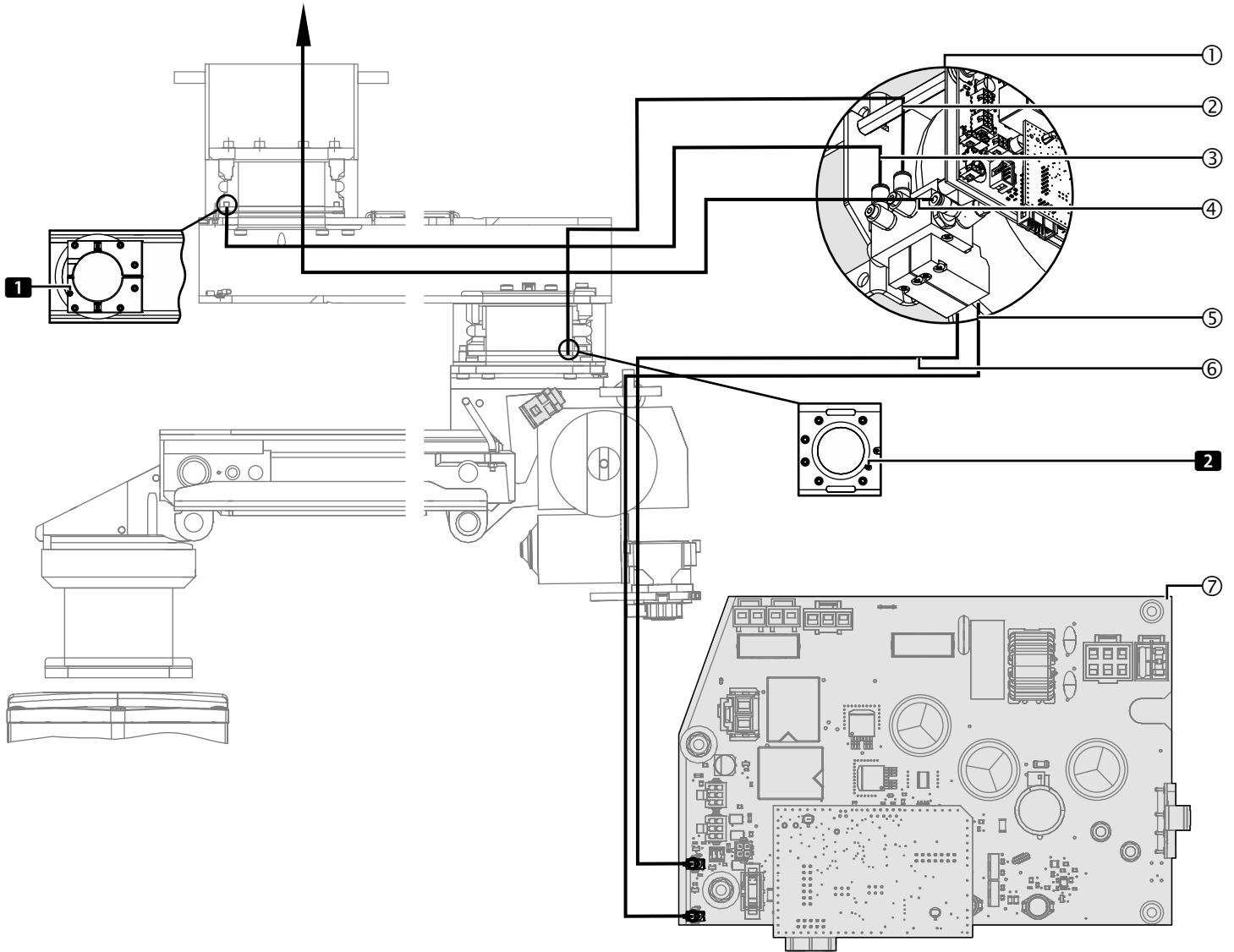


Table 04: Cable assignment: extension arm with motor arm Dual arm, with Navigator M6

No. in Fig. 34	From	To	Designation	Remark
②	Pneumatic unit	Brake connecting point <b>2</b>	Pneumatic pipes, Navigator Lift™ motor arm, Dual	Pre-assembled
③	Pneumatic unit	Brake connecting point <b>1</b>	Pneumatic pipes, Navigator Lift™ motor arm, Dual	Pre-assembled
④	Pneumatic unit	Compressed air outlet	Pneumatic pipes, Navigator Lift™ motor arm, Dual	Pre-assembled
⑤	Pneumatic unit	Main board	Solenoid valve block	Pre-assembled
⑥	Pneumatic unit	Main board	Solenoid valve block	Pre-assembled

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

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

### 11.4.1 Connecting an optional sound or lighting cable

(See "Figure 35")

2. Establish the assembly connection ③ between the cable ② and the extension cable ④ .
3. Route the extension cable ④ in the protective tube through the bow ⑥ , mount the strain relieving mechanism ⑧ and plug the cable plug onto the corresponding main board socket ① as illustrated in the Figure.

### 11.4.2 Connecting the optional extension arm lighting

(See "Figure 35")

4. Mount the extension arm lighting as described in Chapter 10.1, "Mounting the Extension Arm Lighting (for Retrofit only)", on Page 47.
5. Establish the assembly connection ⑥ between the cable ⑤ and the extension cable ⑦ .
6. Route the extension cable ⑦ through the motor arm and bow ⑥ and the extension arm.
7. Establish the assembly connection ⑨ between the cable ⑩ and the extension cable ⑦ .

Figure 35: Connecting optional accessories to the extension arm with motor arm Dual arm, with Navigator M6

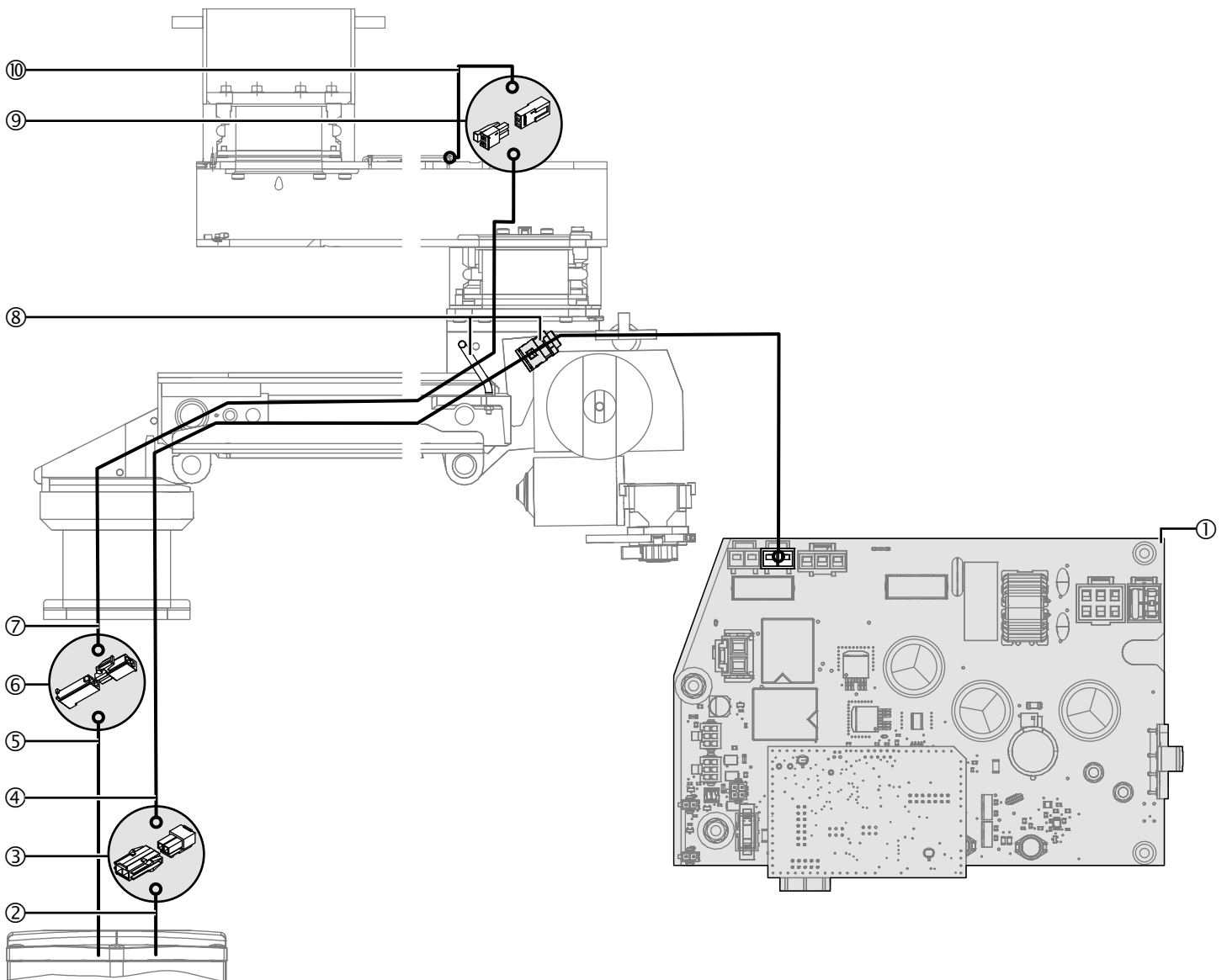


Table 05: Cable assignment: extension arm with motor arm Dual arm, with Navigator M6 – optional accessories

No. in Fig. 35	From	To	Designation	Remark
②	Navigator M6	Assembly connection ③	Navigator M6/Navigator M6 socket interface cable	Integrated into the Navigator M6
④	Assembly connection ③	Main board	Control / Power cable	-
⑤	Navigator M6	Assembly connection ⑥	Extension arm lighting/Navigator M6 cable	Integrated into the Navigator M6
⑦	Assembly connection ⑥	Assembly connection ⑨	Extension arm lighting/Navigator M6 cable	-
⑩	Extension arm lighting	Assembly connection ⑨	-	Integrated into the extension arm lighting

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

(See "Figure 36")

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

1. Observe the safety instructions in Chapter 11.1, on Page 48.
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. Route the earthing cables ① out of the Navigator M6 through the motor arm and the bow ② .
4. Route the earthing cables ① through the extension arm and towards the interface plate.
5. Route the mounted earthing cable ③ of the flange along the ceiling tube towards the interface plate.

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

(See "Figure 37")

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.

### **Note – Swinging out the electronic unit**

To facilitate the installation, swing out the electronic unit as described in Chapter 11.2, on Page 49.

1. Observe the safety instructions in Chapter 11.1, on Page 48.
2. Route the power supply cables and gas hoses ① through the motor arm and the bow ② :
  - Next, route the Navigator M6 without exerting tensile stress on the supply cables and hoses ① .
  - Make sure that the cables laid 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 onto the pendant system as described in the Installation Instructions of the Navigator M6.

Figure 36: Connecting the earthing cables to the extension arm with motor arm Dual arm, with Navigator M6

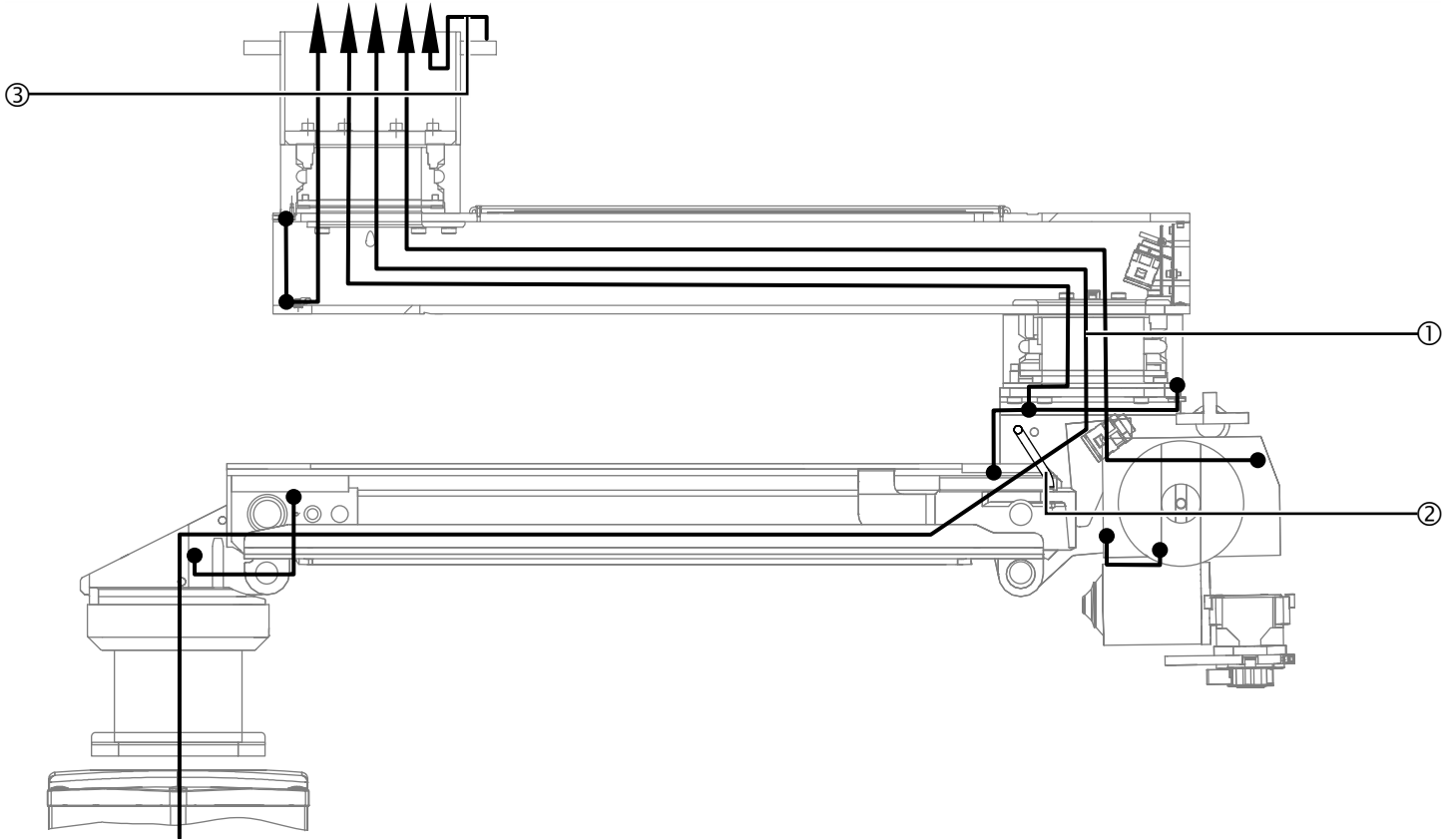
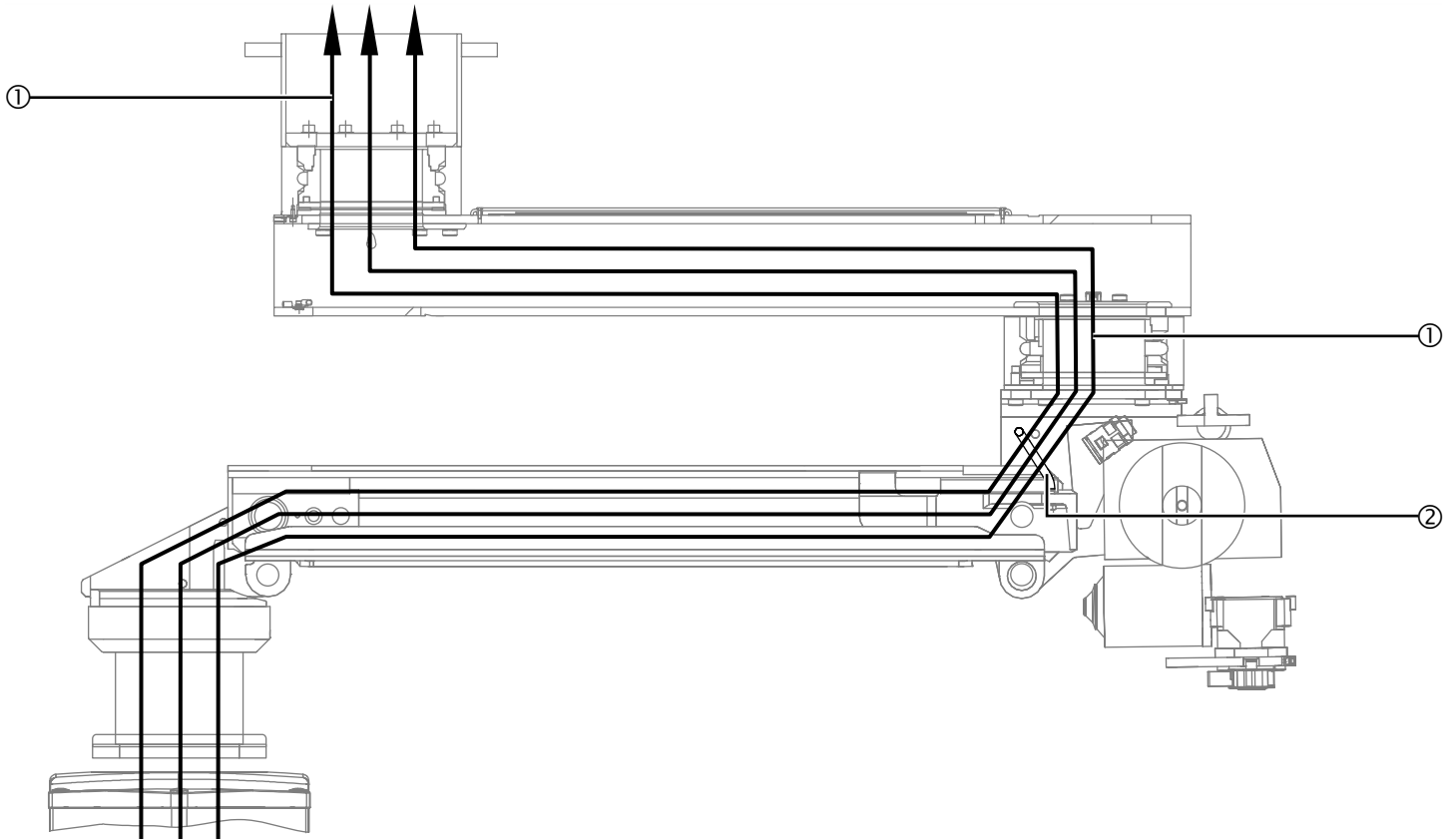


Figure 37: Routing the supply cables and hoses through the extension arm with motor arm Dual arm, with Navigator M6



## 11.7 Connecting the cables to the motor arm, Single arm, with Navigator M6

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

### 11.7.1 Connecting the motor and the end switch of the height adjustment mechanism

(See "Figure 38")

2. Plug the cable plug ② onto the corresponding main board socket ① as illustrated in the Figure.
3. Plug the cable plug ③ onto the corresponding main board socket ① as illustrated in the Figure.

### 11.7.2 Connecting the control cable of the brakes and the height adjustment mechanism

(See "Figure 38")

4. Establish the assembly connection ⑤ between the control cable ④ routed out of the Navigator M6 and the control cable ⑥ .
5. Route the control cable ⑥ in the protective tube through the bow ⑦ , mount the strain relieving mechanism ⑦ and plug the cable plug onto the corresponding main board socket ① as illustrated in the Figure.

### 11.7.3 Mounting the power cable

(See "Figure 38")

6. Plug the power cable plug ⑧ onto the corresponding main board socket ① and route the cable through the extension arm towards the interface plate.
  - If required, a circuit diagram/wiring diagram can be made available by Nuvo.

Figure 38: Connecting the cables to the motor arm, Single arm, with Navigator M6

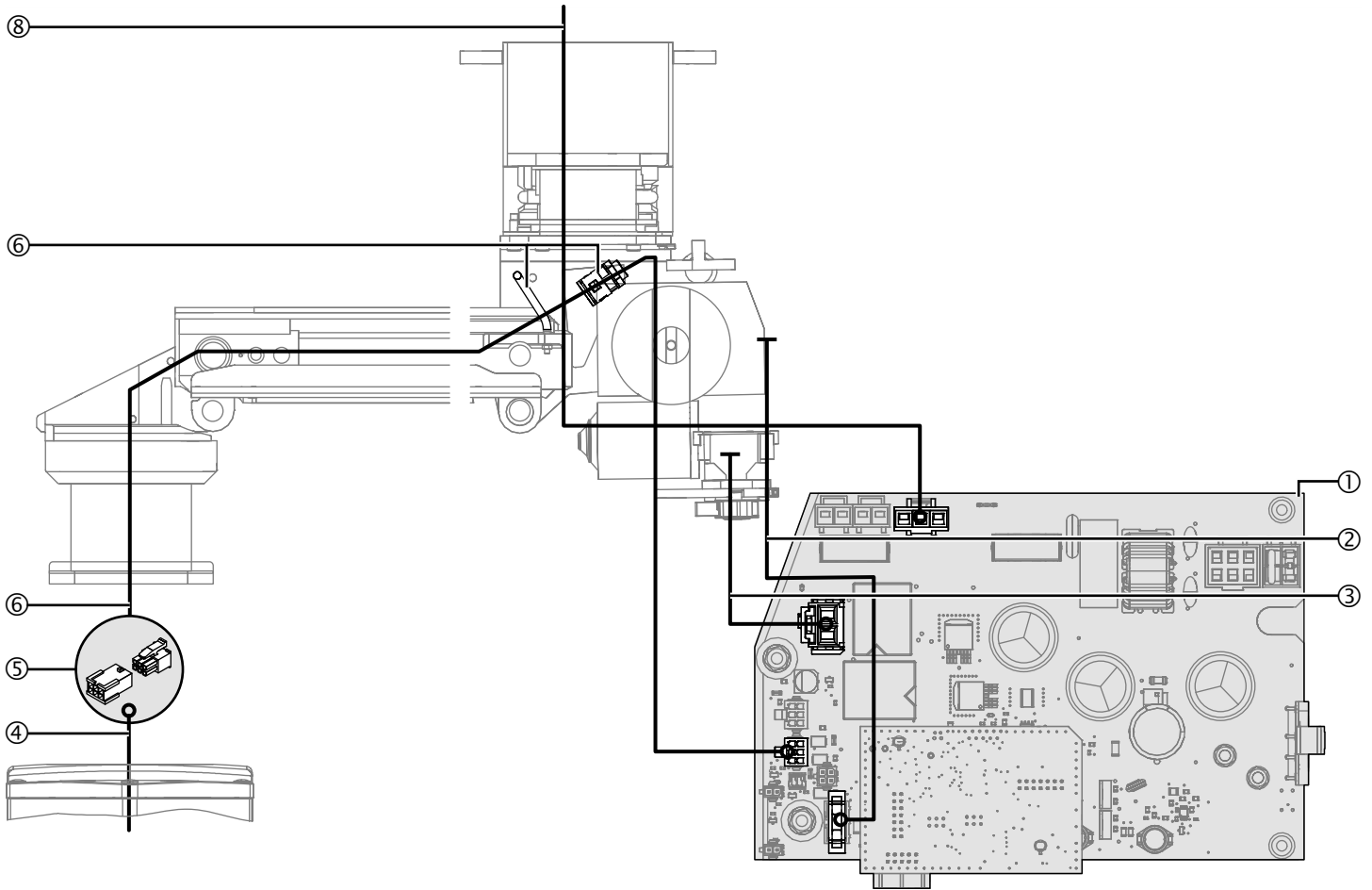


Table 06: Cable assignment: motor arm, Single arm, with Navigator M6

No. in Fig. 38	From	To	Designation	Length [mm]	Remark
②	End switch	Main board	End switch board		Pre-assembled
③	Motor	Main board	Motor connecting cable	-	Integrated into the motor
④	Navigator M6	Assembly connection ①	Navigator M6/Navigator M6 socket interface cable	-	Integrated into the Navigator M6
⑥	Assembly connection ⑤	Main board	Control cable	-	Pre-assembled
⑧	Mains connection	Main board	Mains cable	4000	-

#### 11.7.4 Connecting the pneumatic brake pipes

(See "Figure 39")

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

The pneumatic brake pipes are pre-assembled in the pendant system and plugged onto the brake connecting point **1**. The brake pipes are laid in a spiral coiled tube if required.

#### **NOTE – Installing and disengaging brake pipes**

The pneumatic supply pipe must not be under pressure:

- To install the brake pipes, push them into the brake connecting point. If the brake pipe is correctly positioned, it can no longer be withdrawn from the brake connecting point.
  - To disengage the brake pipes on the plug connector, push in the unlocking mechanism and then remove the brake pipes.
2. Route the brake pipe **2** (BLUE marking) from the pneumatic unit **1** towards the brake connecting point **1** and plug it on.
  3. Route the air supply hose **3** (BLACK marking) from the pneumatic unit **1** towards the compressed air outlet at the installation site and connect it.

#### 11.7.5 Connecting the cables between the pneumatic unit and the main board

(See "Figure 39")

4. Route the cable plug **4** from the pneumatic unit **1** towards the main board **6** and plug it into the corresponding socket.
5. Route the cable plug **5** from the pneumatic unit **1** towards the main board **6** and plug it into the corresponding socket.

Figure 39: Connecting the cables to the extension arm with motor arm Dual arm, with Navigator M6

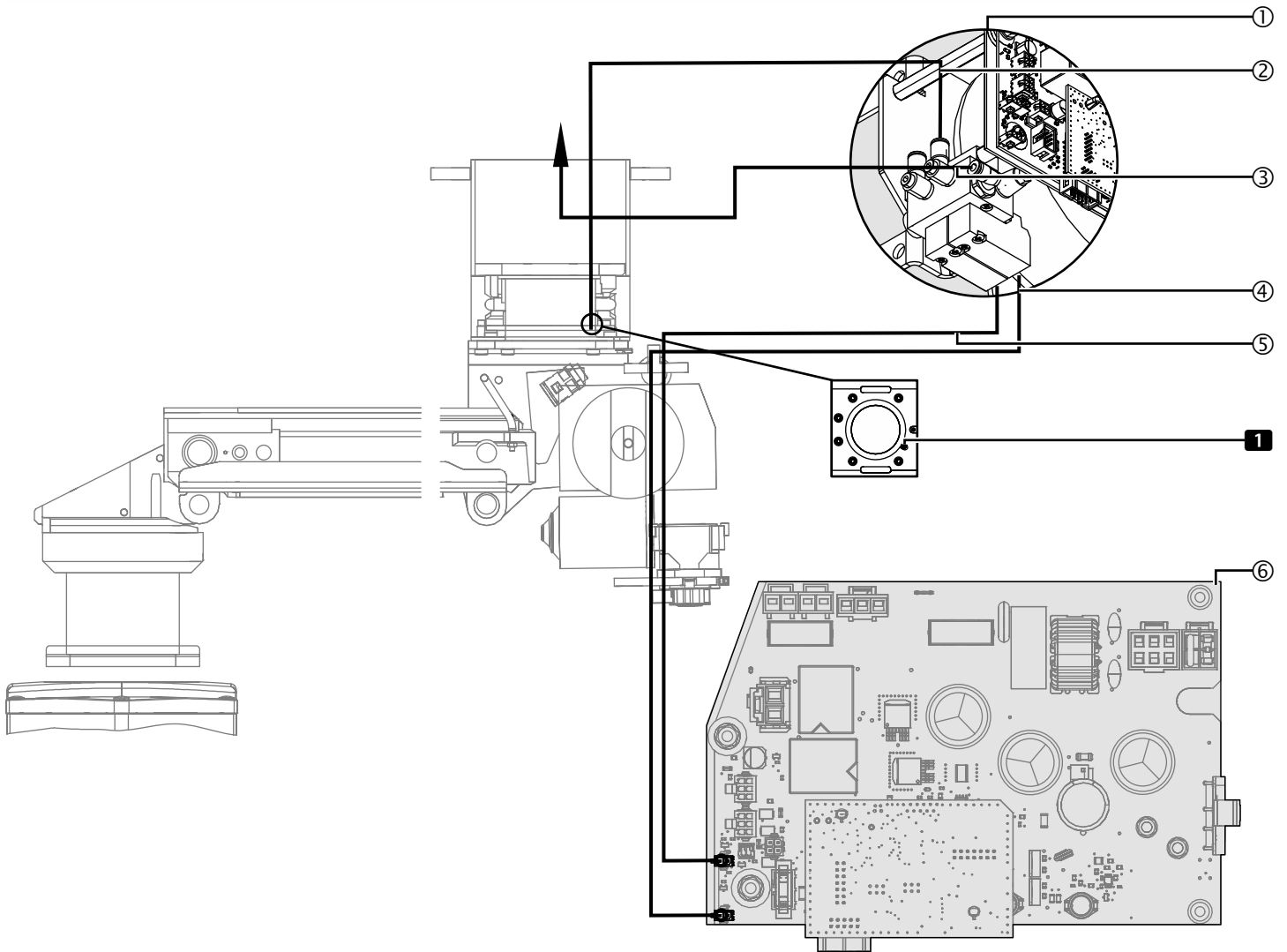


Table 07: Cable assignment: extension arm with motor arm Single arm, with Navigator M6

No. in Fig. 39	From	To	Designation	Remark
②	Pneumatic unit	Brake connecting point <b>1</b>	Pneumatic pipes, Navigator Lift™ motor arm, Single	Pre-assembled
③	Pneumatic unit	Compressed air outlet	Pneumatic pipes, Navigator Lift™ motor arm, Single	Pre-assembled
④	Pneumatic unit	Main board	Solenoid valve block	Pre-assembled
⑤	Pneumatic unit	Main board	Solenoid valve block	Pre-assembled

## 11.8 Connecting optional accessories to the motor arm, Single arm, with Navigator M6

The cables are pre-assembled by Nuvo. The instructions in the paragraphs below only refer to the connection or replacement of cables.

1. Observe the safety instructions in Chapter 11.1, on Page 48.

### 11.8.1 Connecting an optional sound or lighting cable

(See "Figure 40")

2. Establish the assembly connection ③ between the cable ② and the extension cable ④ .
3. Route the extension cable ④ in the protective tube through the bow ⑤ , mount the strain relieving mechanism ⑥ and plug the cable plug onto the corresponding main board socket ① as illustrated in the Figure.

Figure 40: Connecting optional accessories to the motor arm, Single arm, with Navigator M6

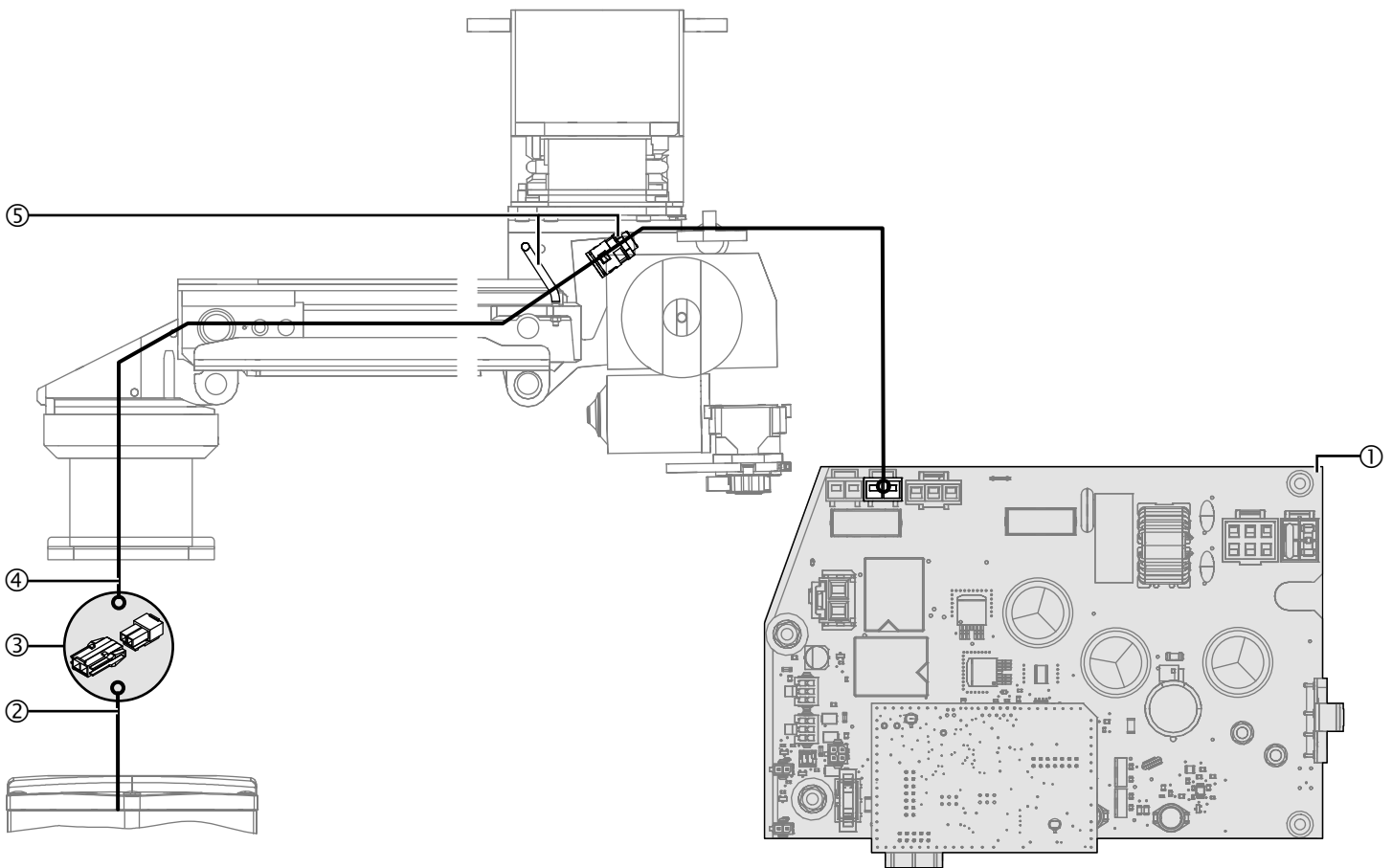


Table 08: Cable assignment: motor arm, Single arm, with Navigator M6 – optional accessories

No. in Fig. 40	From	To	Designation	Length [mm]	Remark
②	Navigator M6	Assembly connection ③	Navigator M6/Navigator M6 socket interface cable	-	Integrated into the Navigator M6
④	Assembly connection ③	Main board	Control / Power cable	-	-

### 11.9 Connecting the earthing cables to the motor arm, Single arm, with Navigator M6

(See "Figure 41")

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

1. Observe the safety instructions in Chapter 11.1, on Page 48.
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. Route the earthing cables ① out of the Navigator M6 through the motor arm and the bow ② .
4. Route the earthing cables ① through the extension arm and towards the interface plate.
5. Route the mounted earthing cable ③ of the flange along the ceiling tube towards the interface plate.

### 11.10 Routing the supply cables and hoses through the motor arm, Single arm, with Navigator M6

(See "Figure 42")

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.

#### **Note – Swinging out the electronic unit**

To facilitate the installation, swing out the electronic unit as described in Chapter 11.2, on Page 49.

1. Observe the safety instructions in Chapter 11.1, on Page 48.
2. Route the power supply cables and gas hoses ① through the motor arm and the bow ② :
  - Next, route the Navigator M6 without exerting tensile stress on the supply cables and hoses ① .
  - Make sure that the cables laid 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 onto the pendant system as described in the Installation Instructions of the Navigator M6.

Figure 41: Connecting the earthing cables to the motor arm, Single arm, with Navigator M6

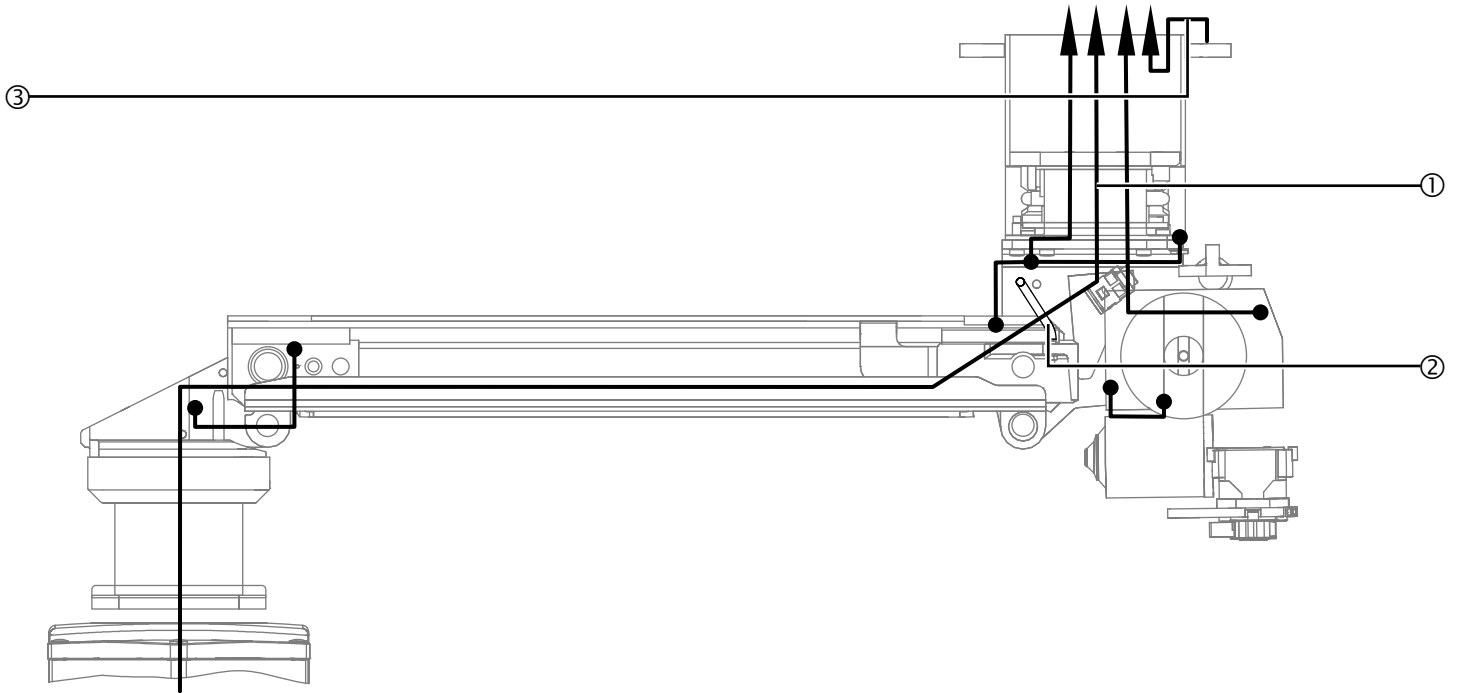
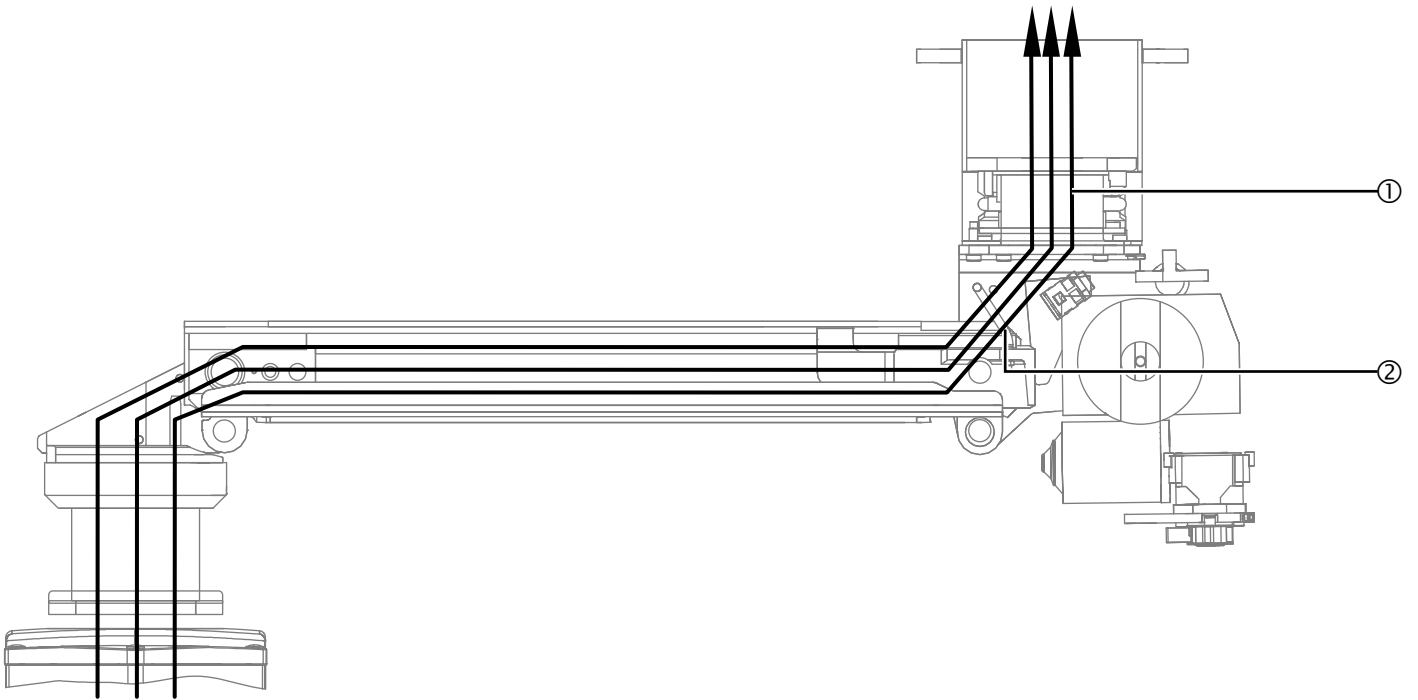


Figure 42: Routing the supply cables and hoses through the motor arm, Single arm, with Navigator M6



## 12.1 Safety Instructions

### WARNING

#### Qualification of installation personnel

**The electrical connection of the pendant system and 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 energized 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 device must be disconnected from the mains:**

- Disconnect all the poles of the power supply source at the installation site / device and prevent the device from being inadvertently switched back on again.
- Check whether the device is de-energised.
- Cover and shield any adjacent energised parts.

#### Electric shock hazard through defective insulation

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

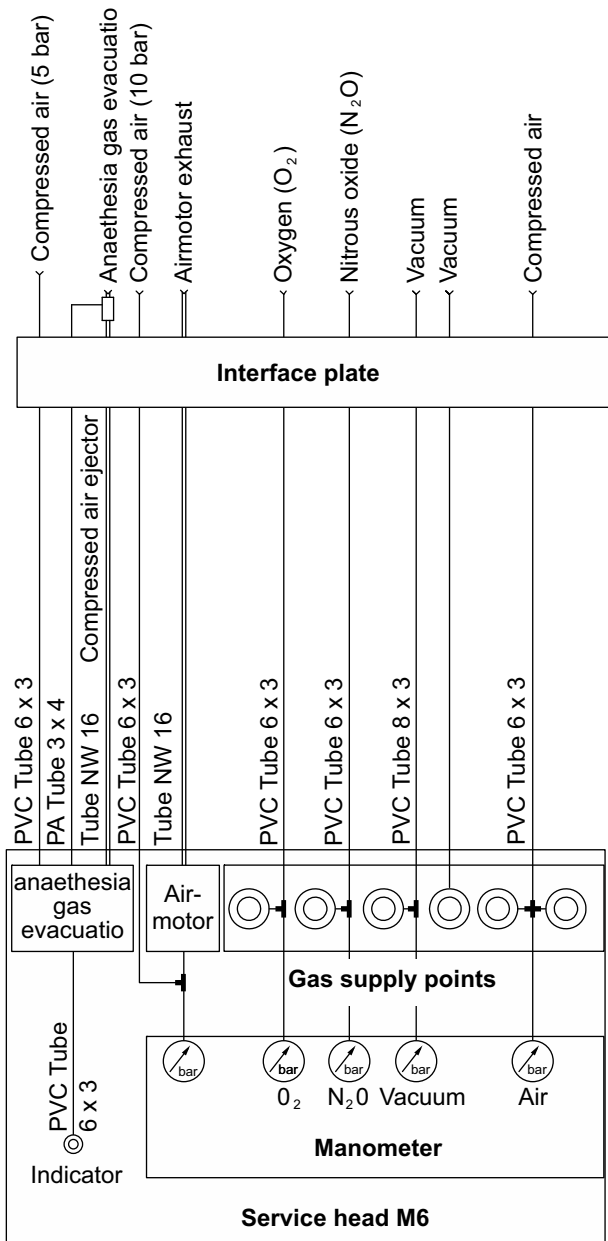
- Always earth the pendant system and the Navigator M6.
- The power supply and earthing cables must be connected to the strain relieving mechanisms of the interface plate.

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

**Damaged power cables can carry an electric voltage of 230 V (120 V) 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 motor 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 to prevent damage (e.g. rubbing of the sheath) 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).

Figure 43: Installing gas supply hoses and exhaust air ducts



## 12.2 Installing gas supply hoses and exhaust air ducts

(See "Figure 43")

1. Observe the safety instructions in Chapter 12.1, on Page 66.

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

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

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

1. Check the gas supply hoses for contamination and clean them with oil-free air.
2. Fit a hose clamp to the gas supply hose, remove the sealing plug and push the hose onto the correct gas supply outlet point.
  - Up to 3 gas outlets and up to 2 vacuum outlets 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 ducts.
5. Perform a gas type test as described in Chapter 13.1, on Page 70.

Figure 44: Connecting the earthing cables

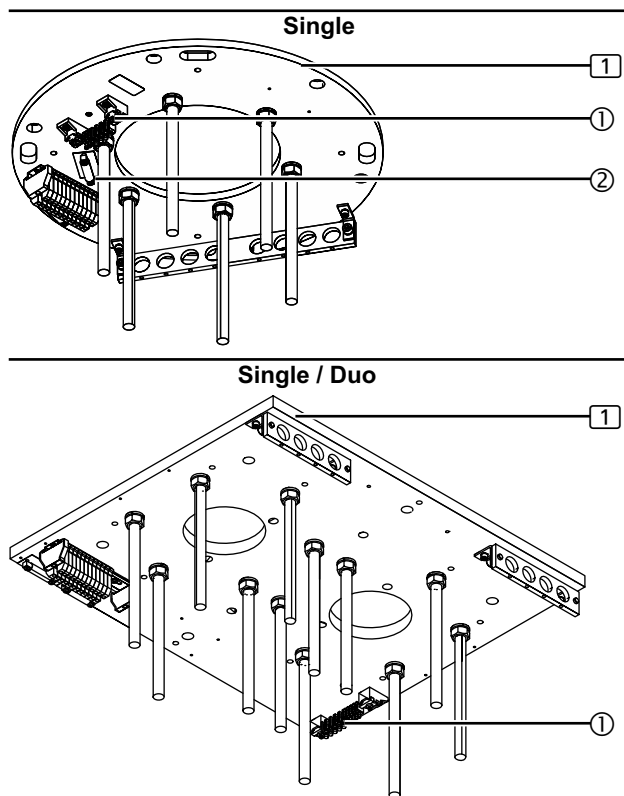
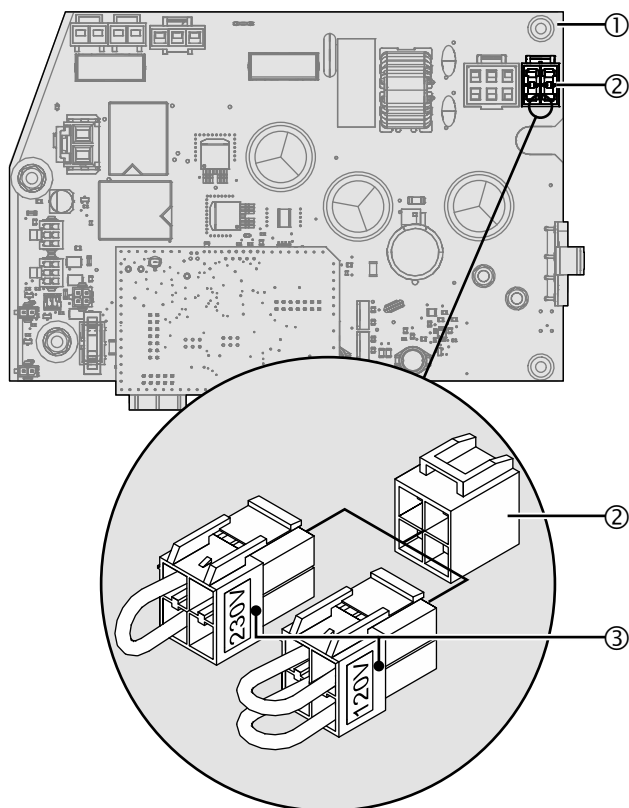


Figure 45: Installing the voltage selection plug for the 120V / 230V power supply



## 12.3 Connecting the earthing cables

(See "Figure 44")

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 66.
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 Installing the voltage selection plug and connecting the power cables

### 12.4.1 Installing the voltage selection plug for the 120V / 230V power supply

(See "Figure 45")

1. Observe the safety instructions in Chapter 12.1, on Page 66.

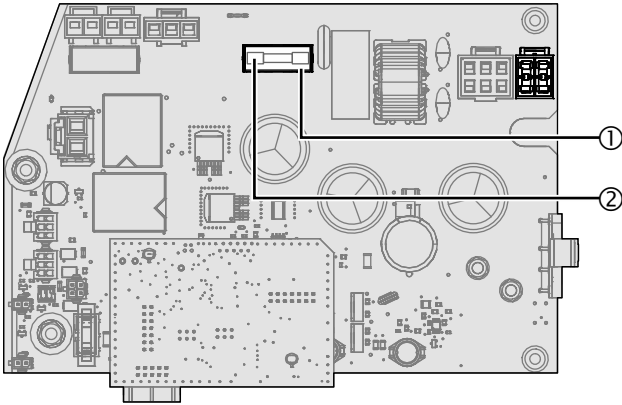
#### NOTICE

##### Power supply failure

**If the 120V or 230V voltage selection plug is incorrectly assigned to the existing power supply the internal fuse trips and the motor arm is no longer ready for operation:**

- When installing the corresponding voltage selection plug, make sure that it is correctly assigned to the existing power supply.
  - If the fuse has tripped, it must be replaced as described in Chapter 12.4.2, on Page 69.
1. If required, swing the electronic unit out of the motor arm as described in Chapter 11.2, on Page 49.
  2. Check the power supply at the installation site and plug the correct voltage selection plug ③ onto the socket ② of the main board ① :
    - For a 100 – 120V power supply = 120V Voltage selection plug
    - For a 220 – 240V power supply = 230V Voltage selection plug

Figure 46: Replacing the fuse



### 12.4.2 Replacing the fuse

(See "Figure 46")

If the fuse has tripped, it can be replaced.

1. Observe the safety instructions in Chapter 12.1, on Page 66.
2. If required, swing the electronic unit out of the motor arm as described in Chapter 11.2, on Page 49.
3. Unlock the cover ① via the unlocking mechanisms on the sides and then remove the cover ① .
4. Remove the fuse ② from the holder.
5. Insert a fuse ② with the following tripping values:
  - Fuse, 5 x 20mm, 8A, 250V AC, time-lag, High breaking capacity
  - Label on the fuse: T 8 A H 250 V
6. Place the cover ① and lock the locking mechanisms on the sides.
7. Check that the cover ① is securely in place.

### 12.4.3 Connecting power 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 66.
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 .

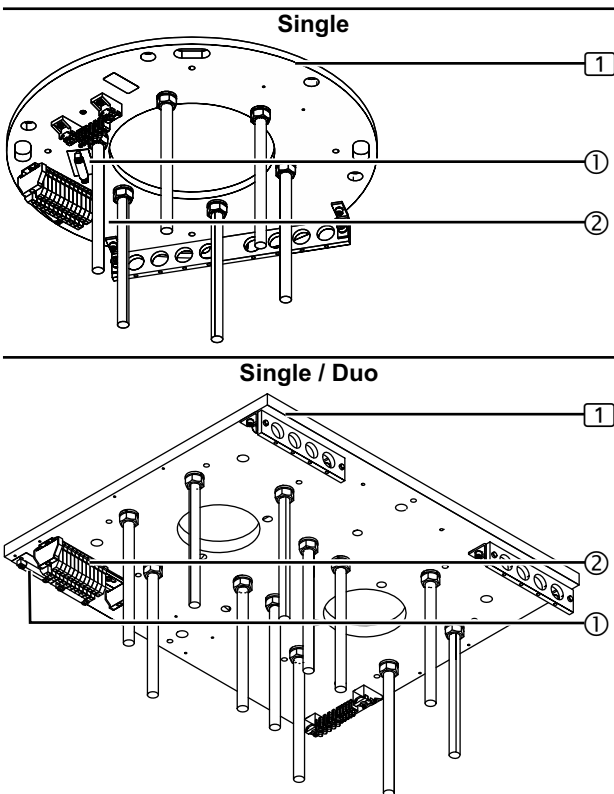
#### NOTE – Connection to separate electric circuit required

- If the electropneumatic brake is overcharged, the power pack can switch off to prevent it from 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™ 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 motor arm.

Figure 47: Connecting power cables



### 13.1 Gas inspection (only Navigator M6)

1. Gas outlets and markings in accordance with 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 48: Preparing the installation of the canopy

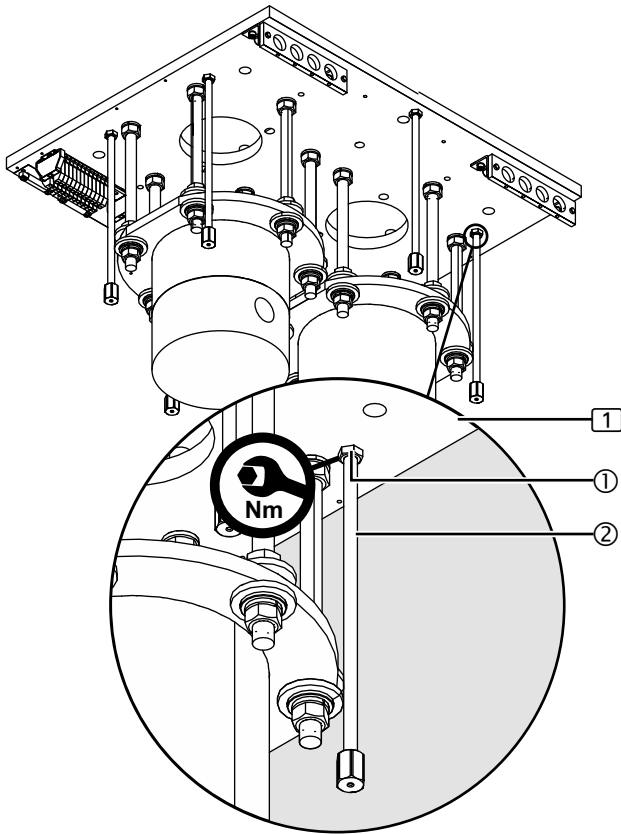
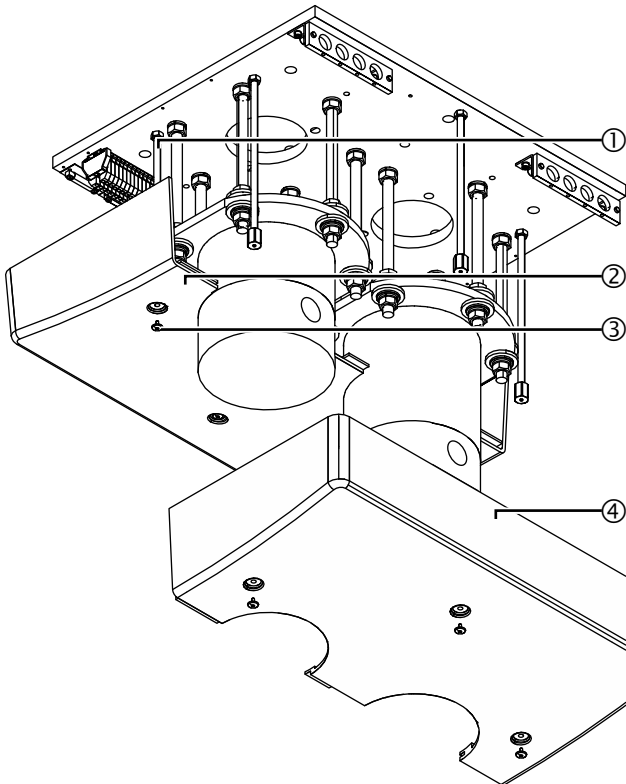


Figure 49: Mounting the canopy halves



## 14.1 Mounting a Single / Dual canopy

### 14.1.1 Preparing the installation of the canopy

(See "Figure 48")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or motor 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 49")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or motor 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 71.
4. Place the sectional strip (not illustrated) onto the second canopy half ④ and push it into the first canopy half ① 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 50: Preparing the installation of the canopy

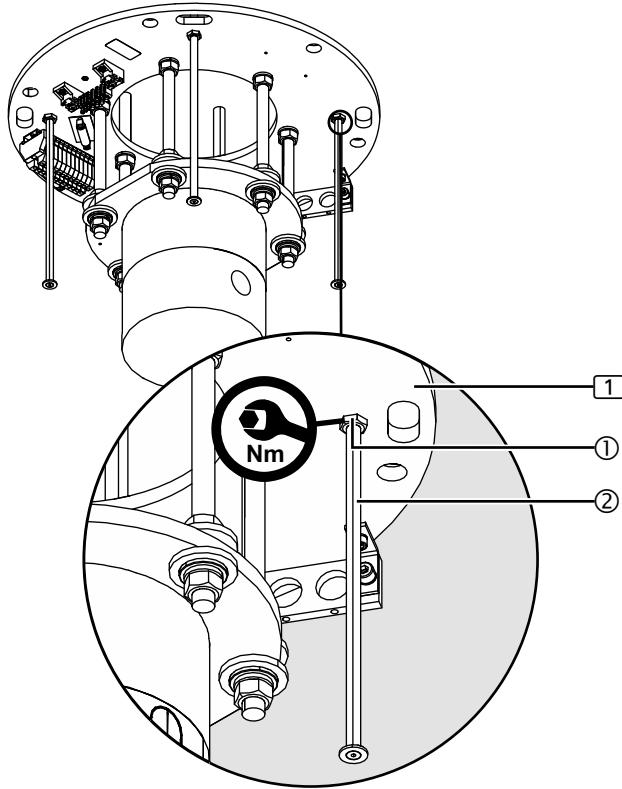
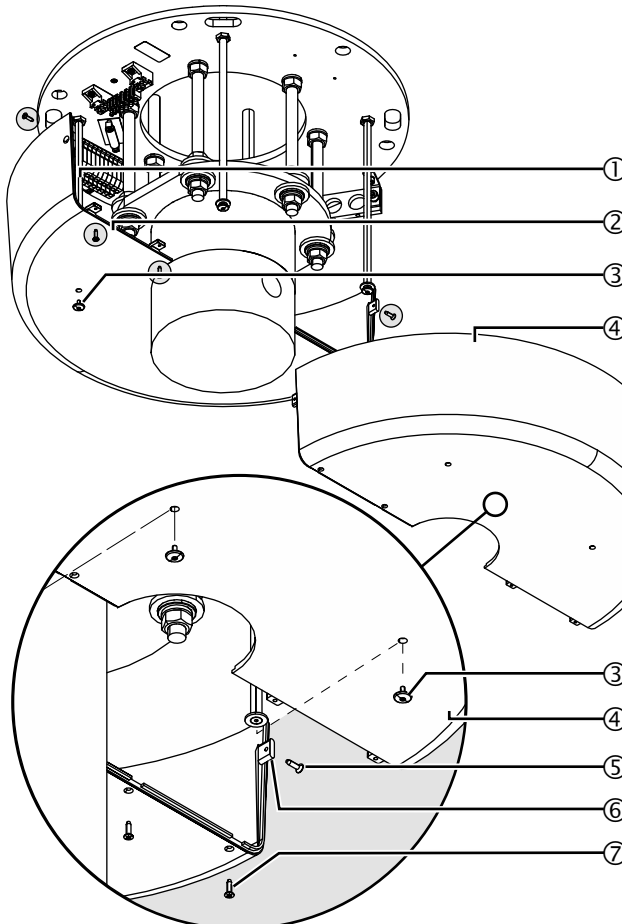


Figure 51: Mounting the canopy halves



## 14.2 Mounting the Single canopy

### 14.2.1 Preparing the installation of the canopy

(See "Figure 50")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or motor 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 18: 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 51")

The Figure shows a simplified illustration of the interface plate without cables and without the extension arm or motor 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 72.
4. Place the sectional strip (not illustrated) 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 52: Mounting the cover caps

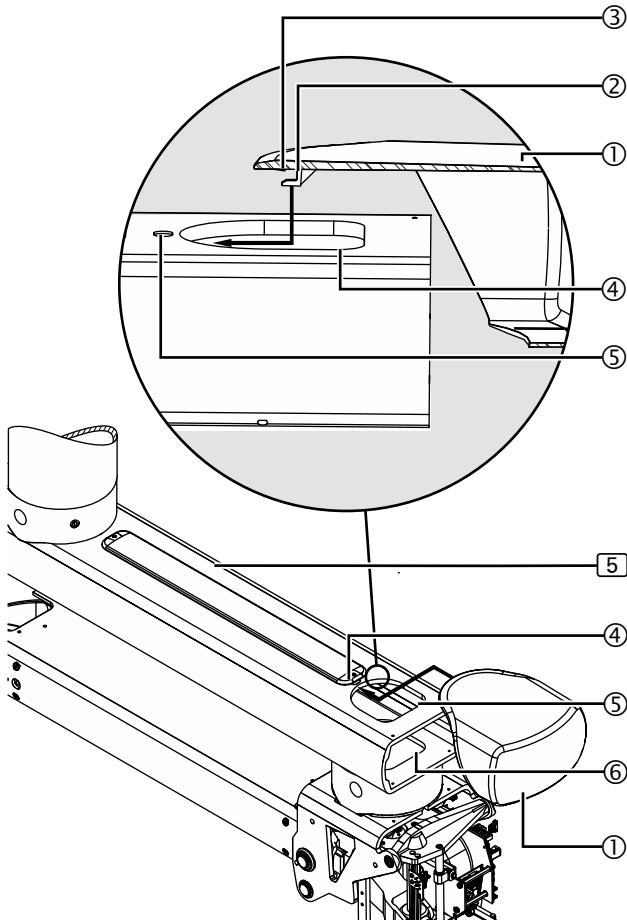
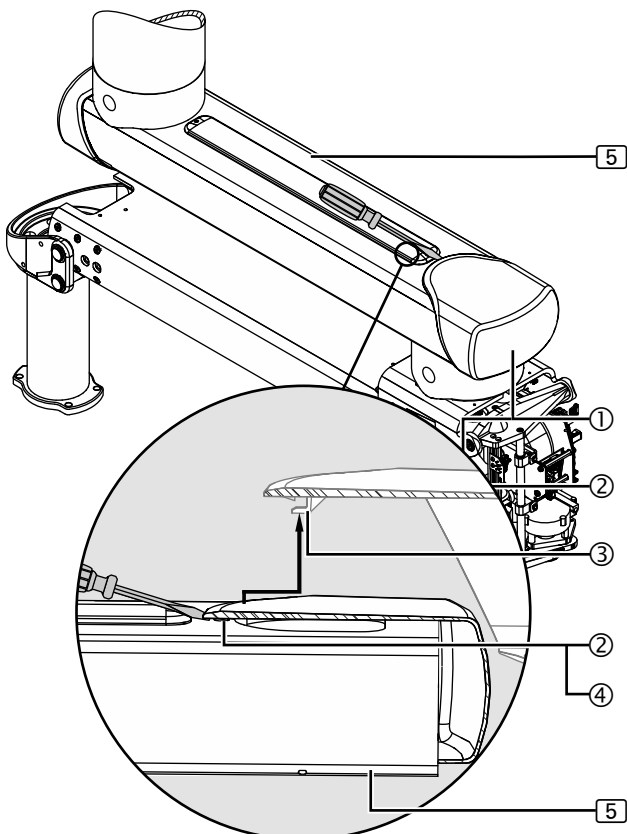


Figure 53: Dismantling the cover caps



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

### 14.3.1 Mounting the cover caps

(See "Figure 52")

The Figure shows a simplified representation with only the extension arm with motor 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 motor 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 cables in the extension arm with motor arm [5] are not damaged.
  - If properly mounted, the cover cap [1] can no longer be withdrawn from the extension arm with motor arm [5].
3. Check that the cover cap [1] is securely in place:
  - The cover cap [1] must be absolutely level with the contours of the extension arm with motor arm [5].

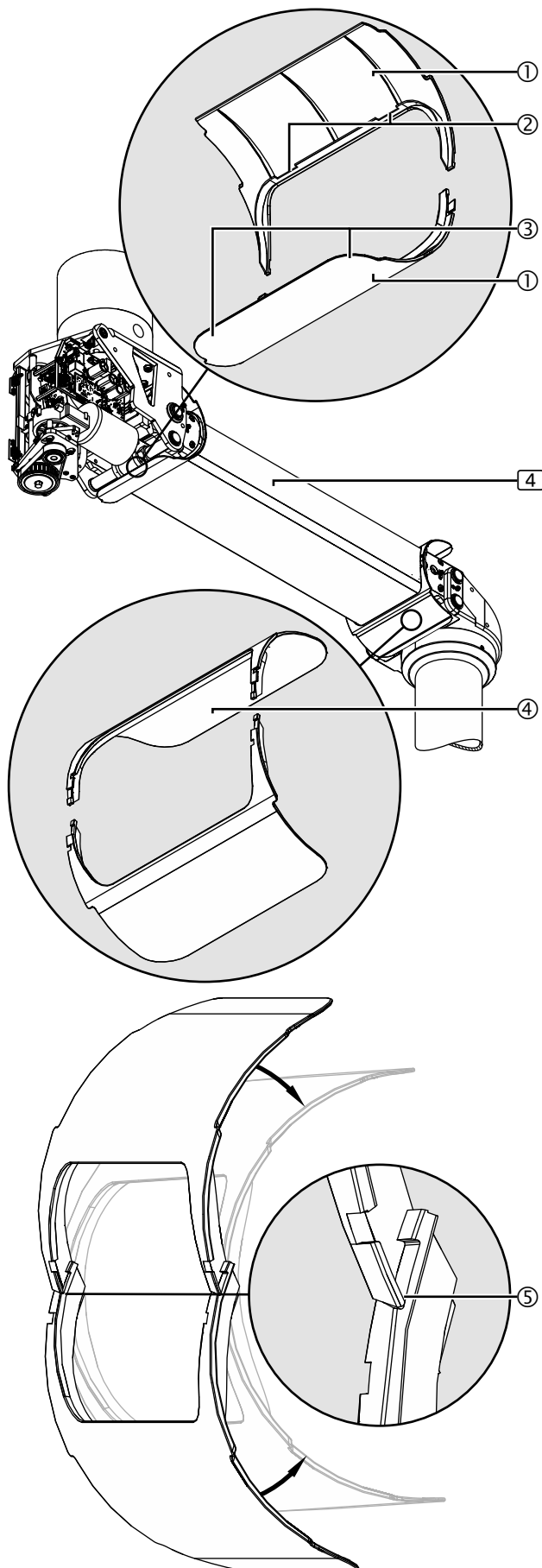
### 14.3.2 Dismantling the cover caps

(See "Figure 53")

The Figure shows a simplified representation with only the extension arm with motor 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 motor arm [5] and gently push the latch [2] out of the groove [4].
  - Make sure you do not damage the paint of the extension arm.
  - 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 54: Mounting the cover plates to the motor arm



## 14.4 Mounting the cover plates to the motor arm

(See "Figure 54")

The Figure shows the motor arm (4). The installation procedure for the extension arm with motor arm (5) version is identical.

The Figure shows a simplified representation with only the motor arm (4) without cables.

### 14.4.1 Inserting the rear cover plates

(See "Figure 54")

#### NOTICE

##### Damage to the cover plates

If the front cover plate is confused with the rear cover plate or vice versa, there is a risk of the cover plates being damaged and becoming unusable.

- Observe the cover plate positions indicated in the description below.

1. Place the 2 rear cover plate halves (1) (on the motor side, identifiable by the 2 cutouts (2) ) around the motor arm.
  - The upper and the lower cover plates are not identically designed.
  - In addition, the lower cover plate can be easily distinguished due to its rounded corners (3) .
2. To make sure that the cover plate halves securely snap into place, put them inside each other in the correct position (5) illustrated in the Figure and then stick them together in the direction of the arrow.
 

â 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 Mounting the front cover plates

(See "Figure 54")

4. Repeat procedure for the 2 front cover plate halves (5) (without cut-outs (2)).

Figure 55: Mounting the rear side panels to the motor arm

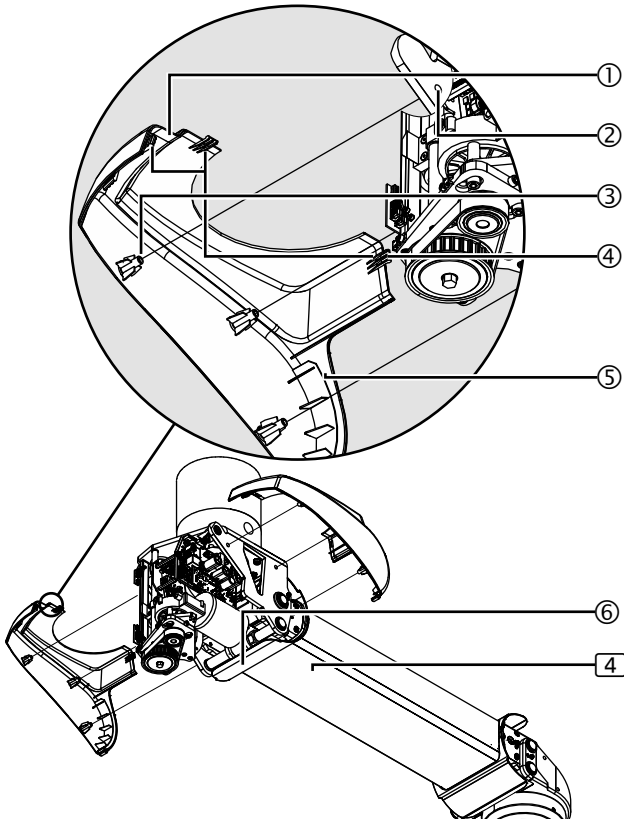
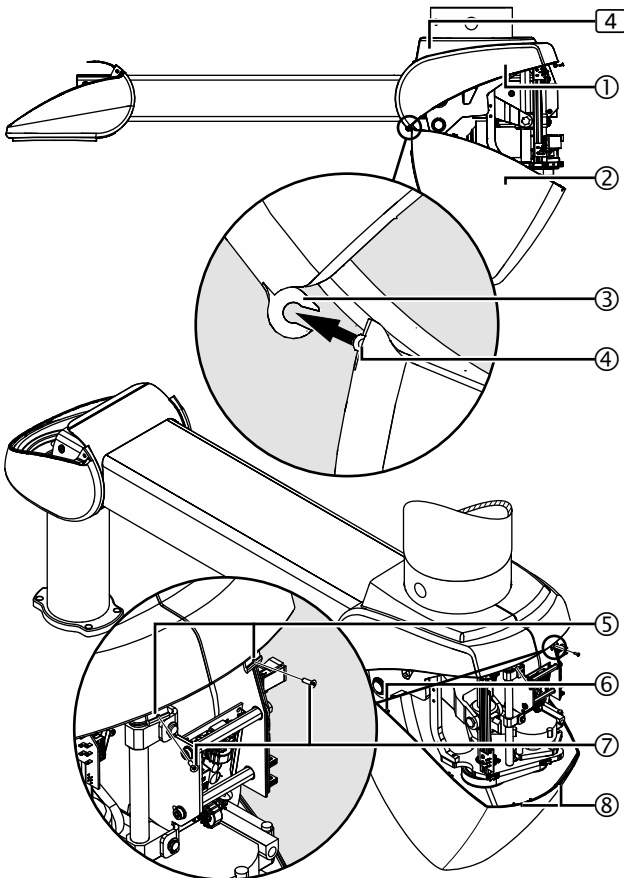


Figure 56: Mounting the lower, rear covers to the motor arm



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

(See "Figure 55")

The Figure shows the motor arm (4). The installation procedure for the extension arm with motor arm (5) version is identical.

The Figure shows a simplified representation with only the motor arm (4) without cables.

- Place the first side cover panel (1) and insert 3 plastic pins (3) into the holes (2) in the motor arm.
  - Make sure that the cover plate (6) protrudes into the guide (5) of the side cover panel (1).
- Place the second side cover panel and insert 3 plastic pins (3) into the holes (2) in the motor arm.
  - The cover plate (6) must protrude into the guide (5) of the side cover panel (1) and the 3 locking devices (4) on the 2 side cover panels must engage with each other.
- Check that the side cover panels are securely in place:
  - The 3 locking devices (4) must be connected to 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 motor arm

(See "Figure 56")

The Figure shows the motor arm (4). The installation procedure for the extension arm with motor arm (5) version is identical.

The Figure shows a simplified representation with only the motor arm (4) without cables.

- Hold the cover (2) in the angle illustrated in the Figure.
- Insert the joint (4) of the rear, lower cover (2) into the 2 mounting fixtures (3) in the upper side cover panels (1).
- Fold up the cover (2) such that the 2 latches (5) snap into place.
- 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.
- Insert 2 Allen countersunk screws M3 x 10mm (7) into the openings (8) in the cover (2) and tighten them.

Figure 57: Mounting the front side panels to the motor arm

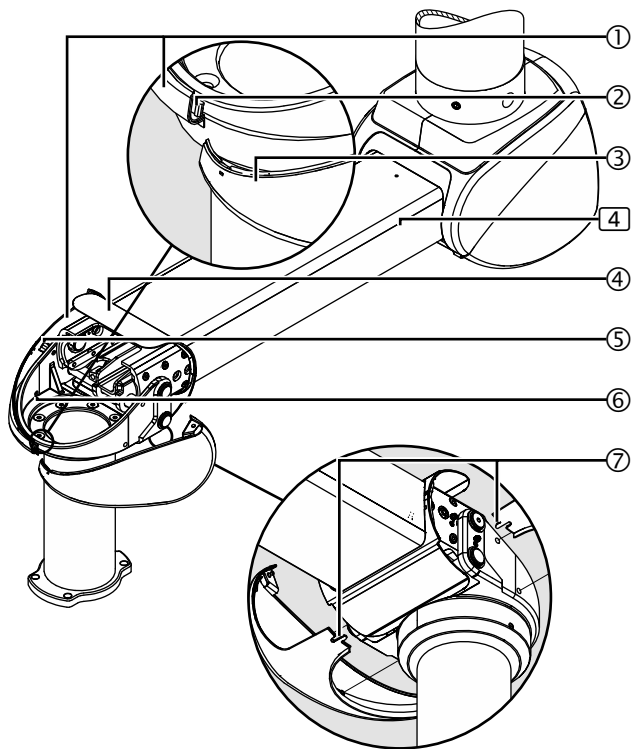
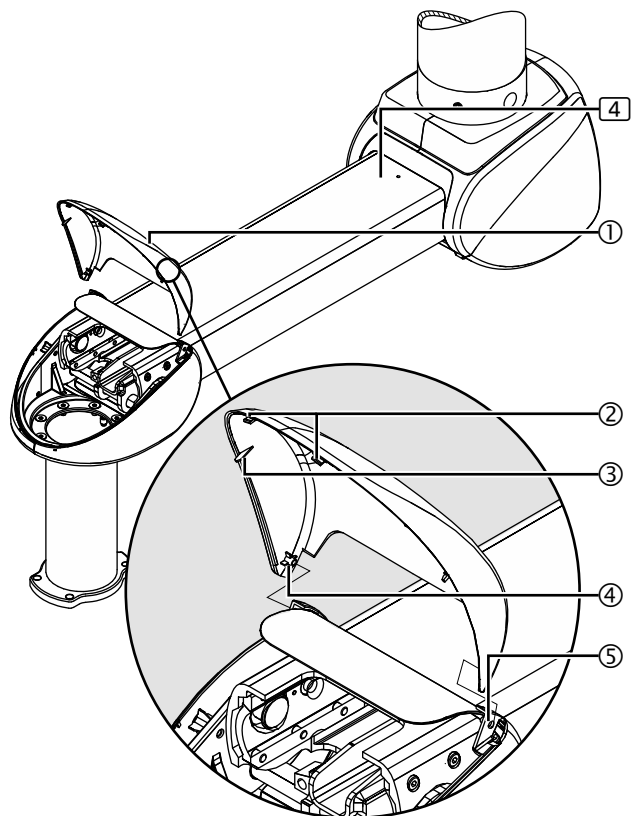


Figure 58: Mounting the front upper cover to the motor arm



## 14.7 Mounting the front side panels to the motor arm

(See "Figure 57")

The Figure shows the motor arm **4**. The installation procedure for the extension arm with motor arm **5** version is identical.

The Figure shows a simplified representation with only the motor arm **4** without cables.

1. Place the right-hand side cover panel **1** and insert 2 plastic pins **5** into the holes **6** in the motor 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 left-hand side cover panel **3** to the mounting fixture **2** on the front of the right-hand side cover panel **1**, route it to the motor arm and then insert 2 plastic pins **5** into the holes **6** in the motor 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 motor arm

(See "Figure 58")

The Figure shows the motor arm **4**. The installation procedure for the extension arm with motor arm **5** version is identical.

The Figure shows a simplified representation with only the motor 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 energized components presents a danger to life from electric shock. Disconnect the device 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 devices connected via the Navigator M6 are de-energised.

Figure 59: Adjusting the brake on the bearing unit  
(only Navigator Lift™ 150 / 250 AirPlus)

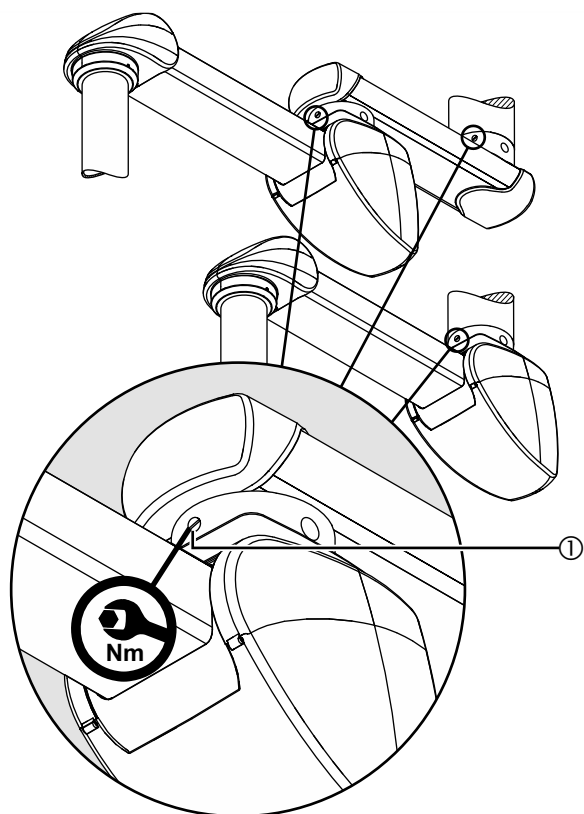
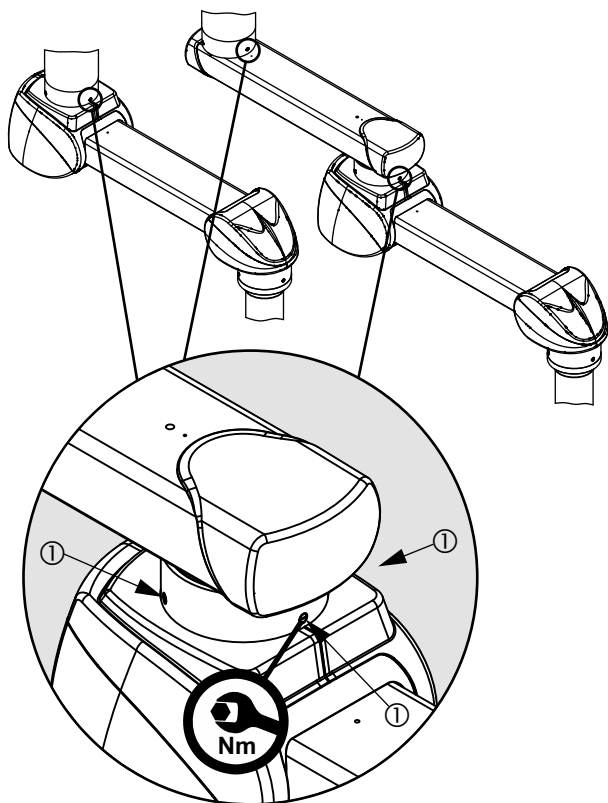


Figure 60: Adjusting the brake on the Bearing Unit Friction  
(only Navigator Lift™ 150 / 250 Friction)



## 15.2 Adjusting the mechanical brakes for the extension arm and motor arm

### 15.2.1 Adjusting the brake on the bearing unit (only Navigator Lift™ 150 / 250 AirPlus)

(See "Figure 59")

In the case of a failure of the pneumatic (compressed air operated) brakes, the additional mechanical brakes (friction brakes) of the Navigator Lift™ 150 / 250 AirPlus version keep the motor arm and spring arm stable in any set position. Adjust the braking force in such a way that the motor arm or extension arm remains stable in any position and can still be conveniently adjusted.

Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.

- Tool to be used
  - Use a suitable torque spanner.
- To increase the braking force
  - Screw the slotted brake screw ① by uniformly rotating it to the right (clockwise).
  - Tighten the brake screw ① to up to 1.6 Nm.
- To reduce the brake force
  - Screw the slotted brake screw ① by uniformly rotating it to the left (counter-clockwise).
- Perform a function test.

### 15.2.2 Adjusting the brake on the Bearing Unit Friction (only Navigator Lift™ 150 / 250 Friction)

(See "Figure 60")

For the pendant system Navigator Lift™ 150 / 250 Friction, the mechanical brakes (friction brakes) keep the extension arm or motor arm in any adjusted position. Adjust the braking force in such a way that the motor arm or extension arm remains stable in any position and can still be conveniently adjusted. If the brakes are not adjusted correctly, the extension arm or motor arm can move automatically in an uncontrolled manner.

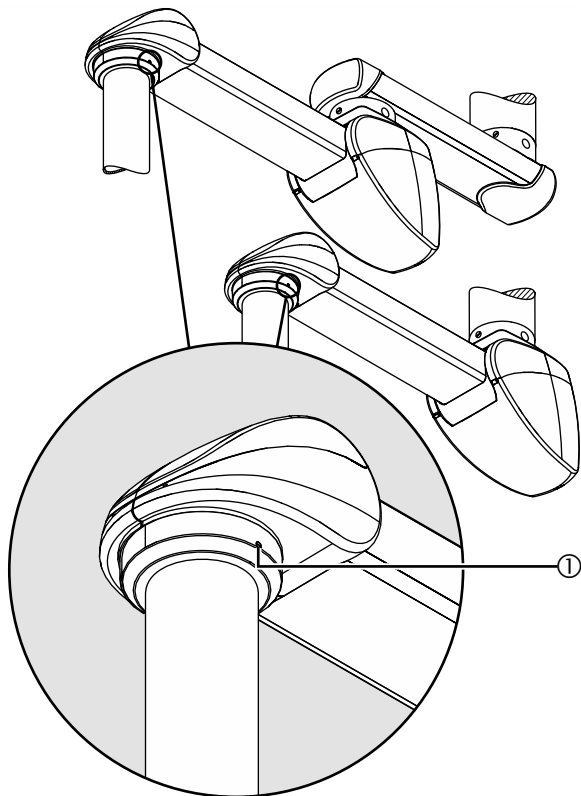
#### **NOTE: Adjusting the brakes on the Navigator Lift™ 150 / 250 Friction Dual**

Observe the end stop recommendation in Chapter 15.8.2, on Page 85 and make sure that you turn the brake screws of the Bearing Unit Friction on the ceiling tube tighter than on the bearing point of the motor arm. This facilitates the bending of the motor arm and allows the bearing unit on the motor arm to rotate freely.

Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.

- Tool to be used
  - Use a suitable torque spanner.
- To increase the braking force
  - Screw the slotted brake screws ① by uniformly rotating them to the right (clockwise).
  - All 3 brake screws must be tightened with the same tightening torque which must, however, not exceed 1.6 Nm.
- To reduce the brake force
  - Screw the slotted brake screws ① by uniformly rotating them to the left (counter-clockwise).

Figure 61: Adjusting the brake on the Drop tube Friction (slide bearing)



- Perform a function test

### 15.3 Adjusting the brake on the Drop tube Friction (slide bearing)

(See "Figure 61")

For all pendant system versions, the mechanical brake (friction brake) on the Drop tube keeps the adaption (e.g. the Navigator M6) in the adjusted position.

Adjust the brake force of the corresponding end device (e.g. Navigator M6) such that the end device remains stable in any set position and can still be conveniently adjusted.

Follow the safety instructions

Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.

Tool to be used

Use a suitable slotted screwdriver.

To increase the braking force

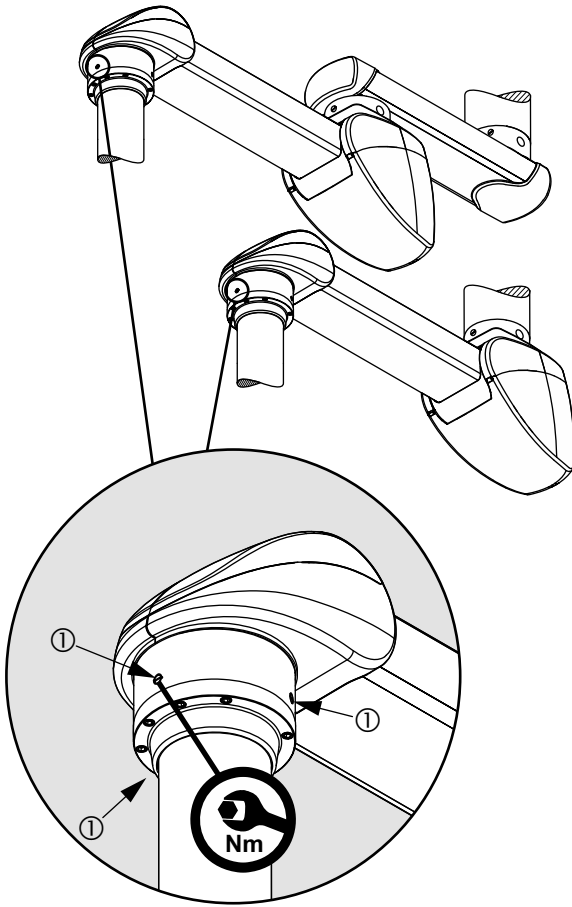
- Insert the slotted screwdriver into the brake screw ① and turn in the clockwise direction.

To reduce the braking force

- Insert the slotted screwdriver into the brake screw ① and turn it to the left (anti-clockwise).

- Perform a function test.

Figure 62: Adjusting the brake on the Drop tube Friction (roller bearing)



## 15.4 Adjusting the brake on the Drop tube Friction (roller bearing)

(See "Figure 62")

The brake screws (friction brakes) are adjusted in the same way for all the different pendant system versions.

In the case of the Drop tube with friction bearing unit, the mechanical brakes ① (3 friction brakes) maintain the end device (e.g. Navigator M6) in the adjusted position.

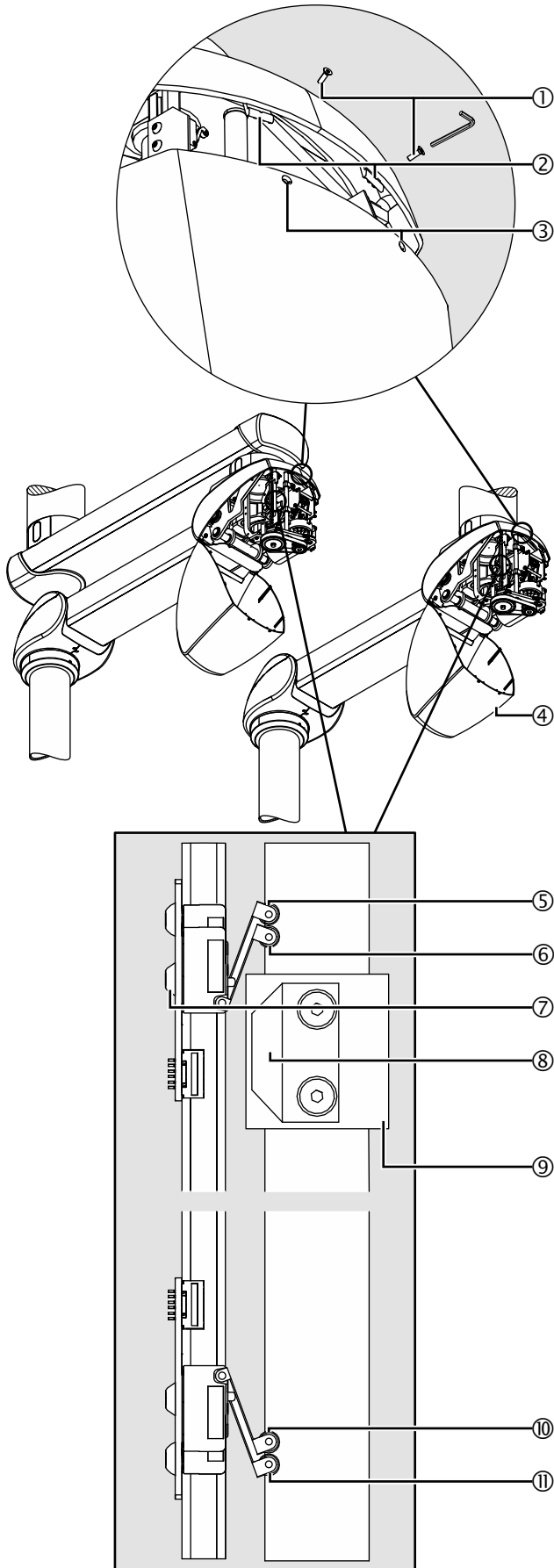
Adjust the braking force in such a way that the corresponding end device (e.g. Navigator M6) remains stable in any set position and can still be conveniently adjusted.

Follow the safety instructions

Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.

- Tool to be used
  - Use a suitable torque spanner.
- To increase the braking force
  - Screw the slotted brake screws ① by uniformly rotating them to the right (clockwise).
  - All 3 brake screws must be tightened with the same tightening torque which must, however, not exceed 1.6 Nm.
- To reduce the brake force
  - Screw the slotted brake screws ① by uniformly rotating them to the left (counter-clockwise).
- Perform a function test

Figure 63: Opening the bottom rear cover



## 15.5 Adjusting the vertical lift on the motor arm

(See "Figure 63")

The simplified representation illustrates the extension arm and motor arm without the cables mounted.

The adjustment is identical for all versions.

The motor arm has a vertical lift of +20 degrees in the upwards direction and -30 degrees in the downwards direction. The vertical lift can be restricted in both the upwards and the downwards direction.

### 15.5.1 Functioning of the vertical lift

(See "Figure 63")

1. To adjust the height of the motor arm, the end stop ⑧ on the ball screw nut ⑨ is routed towards the 2 upper end switches ⑤/⑥ and 2 lower end switches ⑩/⑪ which switch off the motor.
2. The end switch ⑥ or ⑩ actuated first by the end stop ⑧ ensures a decelerated starting or braking (SoftStart / SoftStop) of the motor. The second end switch ⑤ or ⑪ switches off the motor.
3. The upper and lower vertical lifts are adjusted separately from each other and one after the other. To adjust the vertical lift, move the motor arm to the desired upper or lower height position.
4. Disconnect all poles of the pendant system from the mains and prevent it from being switched back on again.

### 15.5.2 Opening the bottom rear cover

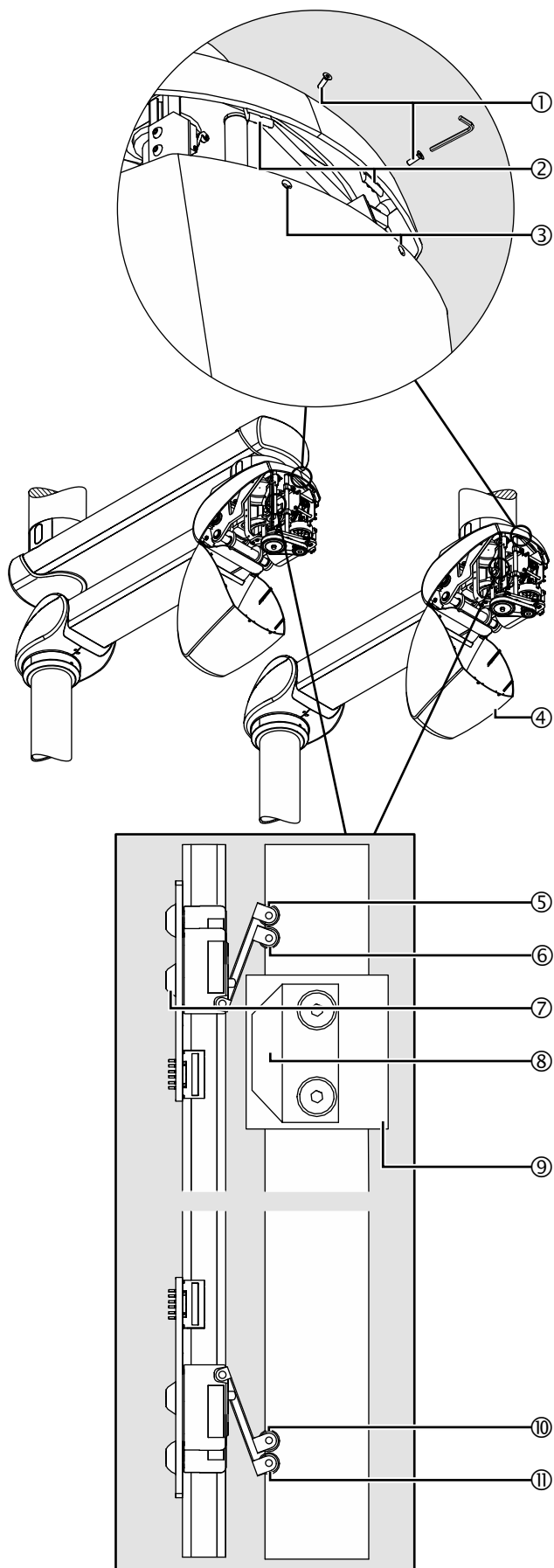
(See "Figure 63")

Tool to be used

Use an Allen key (size 2).

5. Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.
6. Unscrew the 2 Allen countersunk screws M3 x 10mm ① from the 2 openings ③ .
7. Disengage the 2 latches ② .
8. Manually route the bottom rear cover ④ completely downwards until it points downwards in a fully vertical position.
  - To remove the cover ④ , swivel it approx. 45 degrees downwards. Make sure that this position is passed before releasing the cover ④ .

Figure 64: Adjusting the vertical lift and shutting the bottom rear cover



### 15.5.3 Adjusting the vertical lift

(See "Figure 64")

Tool to be used

Use an Allen key (size 2.5).

9. Unscrew 2 Allen countersunk screws M4 x 6 mm ⑦ – ISO 7380 – 10.9.
10. Push the circuit board with the end switches ⑤/⑥ towards the end stop ⑧ until the end switch ⑤ or ⑩ audibly clicks into place and then tighten the 2 Allen countersunk screws M4 x 6 mm ⑦ – ISO 7380 – 10.9.

#### NOTICE

##### Risk of damaging the motor arm

If the motor arm is moved without a correctly installed end switch, the motor arm can be damaged and must be replaced:

- Never move the motor arm without a correctly installed end switch.



The vertical lift adjustment can change gradually during operation if the Allen countersunk screws M4 x 6 mm ⑦ – ISO 7380 – 10.9 have not been properly tightened:

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

- Tighten the Allen countersunk screws M4 x 6 mm ⑥ to 3Nm.

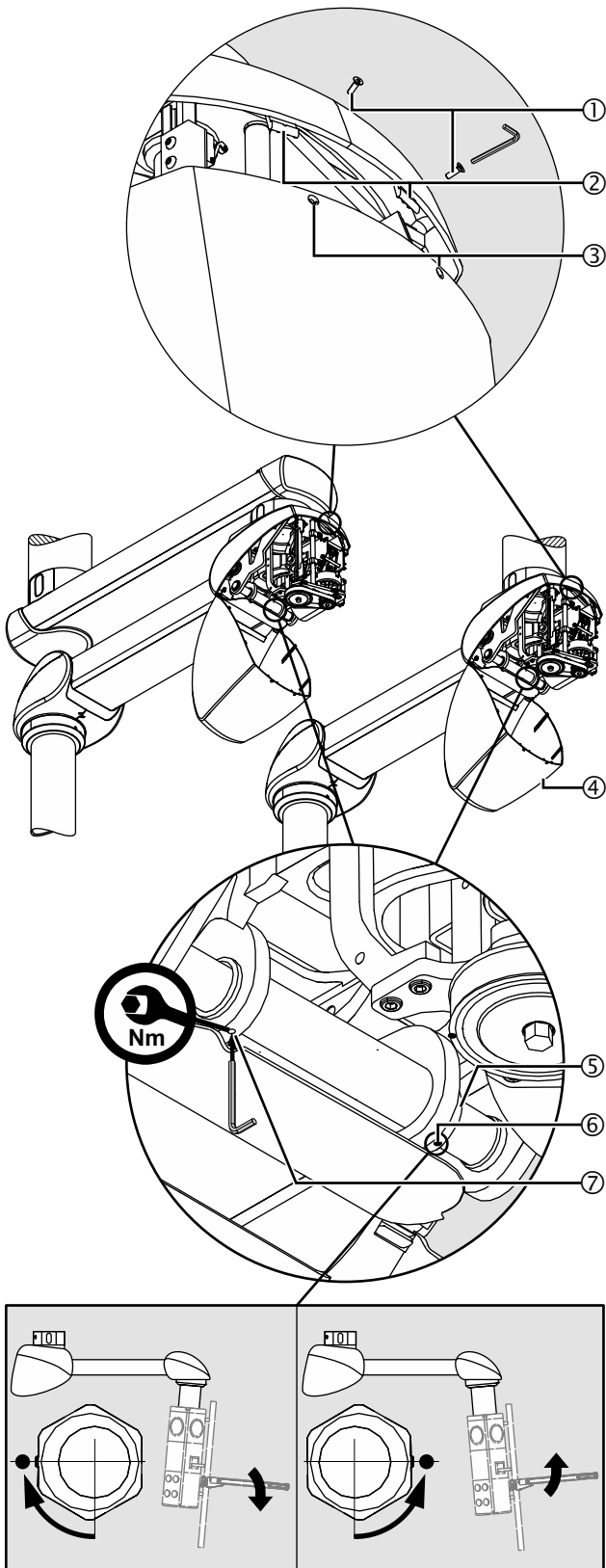
11. Close the bottom rear cover ④ as described in Chapter 15.5.4, on Page 81 and perform a function test.
12. Repeat these steps for the end switches ⑩/⑪ if required.

### 15.5.4 Closing the bottom rear cover

(See "Figure 64")

13. Fold up the bottom rear cover ④ until the 2 latches ② snap into place.
14. Check that the cover ④ is securely in place:
  - The guides (not illustrated in the Figure) of the cover ④ must sit in the side cover panels.
  - The cover ④ must sit on the side panels without gaps.
15. Insert 2 Allen countersunk screws M3 x 10mm ① into the 2 openings ③ in the cover ④ and tighten them.

Figure 65: Correcting the vertical alignment of the Navigator M6



## 15.6 Correcting the vertical alignment of the Navigator M6

(See "Figure 65")

After mounting an end device (e.g. medical device) it may be necessary to vertically align this end device.

### 15.6.1 Opening the bottom rear cover

(See "Figure 65")

Tool to be used

Use an Allen key (size 2).

1. Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.
2. Unscrew the 2 Allen countersunk screws M3 x 10mm ① from the 2 openings ③.
3. Disengage the 2 latches ②.
4. Manually route the bottom rear cover ④ completely downwards until it points downwards in a fully vertical position.
  - To remove the cover ④, swivel it approx. 45 degrees downwards. Make sure that this position is passed before releasing the cover ④.

### 15.6.2 Correcting the vertical alignment

(See "Figure 65")

Tool to be used

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

5. Loosen the setscrew M4 ⑦ – DIN 914.
6. Place the spanner wrench onto the hexagonal bolt ⑤.
  - The indicator screw ⑥ points downwards (do not loosen this screw).

To lower e.g. the shelf:

- Rotate the hexagonal bolt ⑤ such that the indicator screw ⑥ points forwards (towards you). See "Figure 65:" Bottom detail view.

To lift e.g. the shelf:

- Turn the hexagonal bolt ⑤ such that the indicator screw ⑥ points backwards (away from you). See "Figure 65:" Bottom detail view.
7. Perform a function test.
  8. Tighten the setscrew M4 ⑦ – DIN 914.

#### NOTE – Vertical alignment changing



The vertical alignment can change progressively during use if the setscrew M4 ⑦ – DIN 914 has not been properly tightened:

The Navigator M6 no longer remains stable in its adjusted position:

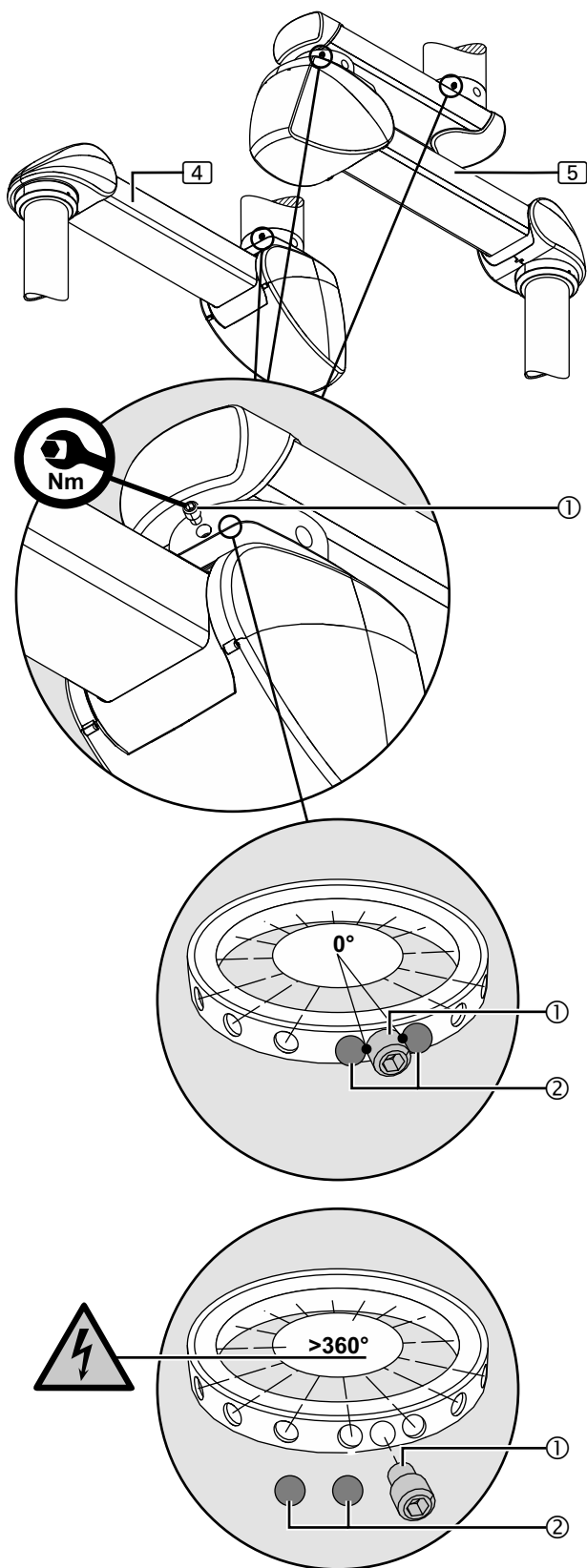
- Tighten the setscrew M4 ⑦ – DIN 914 with a tightening torque of 2 Nm.

### 15.6.3 Closing the bottom rear cover

(See "Figure 65")

9. Close the bottom rear cover ④ as described in Chapter 15.5.4, on Page 81.

Figure 66: Condition of the swivel stop on the extension arm and motor arm as supplied by Nuvo



## 15.7 Condition of the swivel stop on the extension arm and motor arm as supplied by Nuvo

The Figure illustrates the pendant system Navigator Lift™ 150 / 250 Air-Plus. The swivel stop delivered for the pendant system Navigator Lift™ 150 / 250 Friction is identical.

### 15.7.1 Extension arm and motor arm with pre-assembled swivel stop

(See "Figure 66")

The 2 ball stops ② and the setscrew ① are pre-assembled by Nuvo. The swivel range of the motor arm ④ or the extension arm with motor arm ⑤ is thus restricted to 0 degrees. This ensures that the extension arm and the motor arm cannot be rotated and no internal supply cables can tear off.

To adjust the swivel stops

- Change or dismantle the swivel stops as described in Chapter 15.8.4, on Page 87

### 15.7.2 Extension arm and motor arm without pre-assembled swivel stop

(See "Figure 66")

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

## ⚠ WARNING



### Electric shock hazard

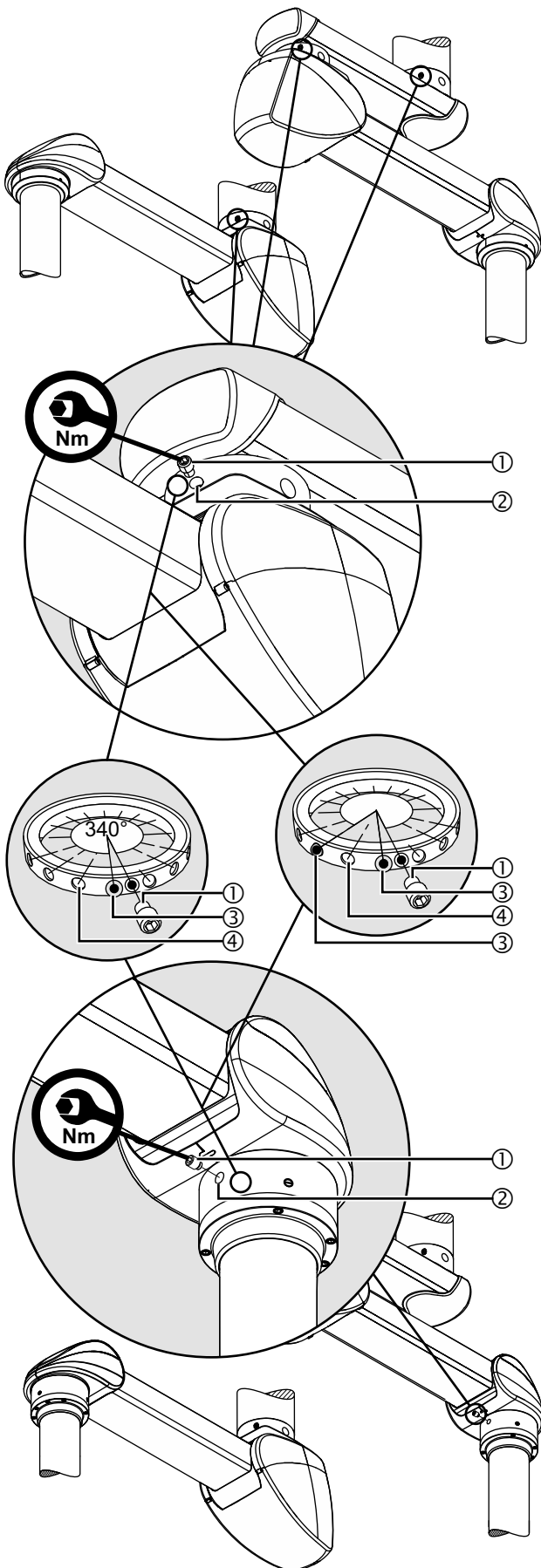
**In order to prevent the internal supply cables twisting off, at least 1 ball stop must be mounted. This ball stop serves as twist protection:**

- If no swivel stops have been pre-assembled, the extension arm and the motor arm must not be rotated before the swivel stops have been mounted.
- To restrict the angle of rotation of the extension arm or motor arm to 340 degrees, mount at least 1 ball stop as described in Chapter 15.8.3, on Page 86

To adjust the swivel stops

- Mount the swivel stops as described in Chapter 15.8.2, on Page 85 and Chapter 15.8.3, on Page 86.

Figure 67: Adjusting the swivel stop on the extension arm, motor arm and Drop tube



## 15.8 Adjusting the swivel stop on the extension arm, motor arm and Drop tube

(See "Figure 67")

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

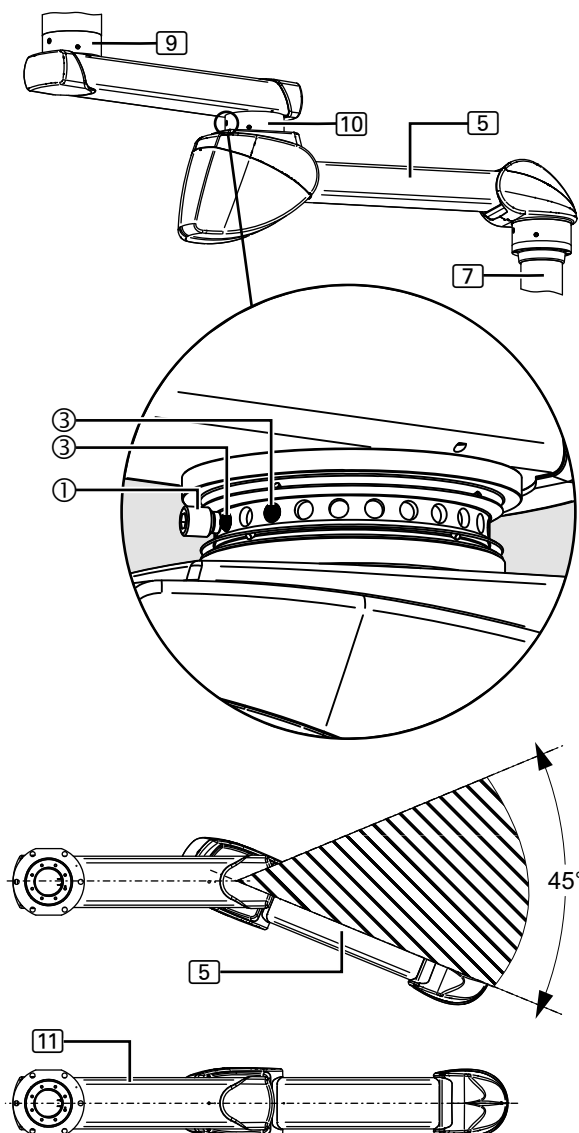
In order to prevent the internal supply cables twisting off, at least 1 ball stop must be mounted. This ball stop serves as twist protection:

- To restrict the angle of rotation of the extension arm, motor arm or Drop tube to 340 degrees, mount at least 1 ball stop as described in Chapter 15.8.3, on Page 86

#### 15.8.1 Tool to be used

A magnetic pin is required in order to offset the ball stop. A telescopic magnetic pick-up tool set can be ordered from Nuvo.

Figure 68: Stop recommendation: Dual-arm pendant system with Bearing Unit Friction (roller bearing)



### 15.8.2 Stop recommendation: Dual-arm pendant system with Bearing Unit Friction (roller bearing)

(See "Figure 68")

For all dual-arm pendant systems with a Bearing Unit Friction as intermediate bearing (10), Nuvo recommends that you mount 2 ball stops (3) (position illustrated in the Figure).

The detailed representation illustrates the intermediate bearing (10) (without external bearing ring) and the position of the stop screw (1) to the ball stops (3).

#### NOTE: Movement range of the motor arm

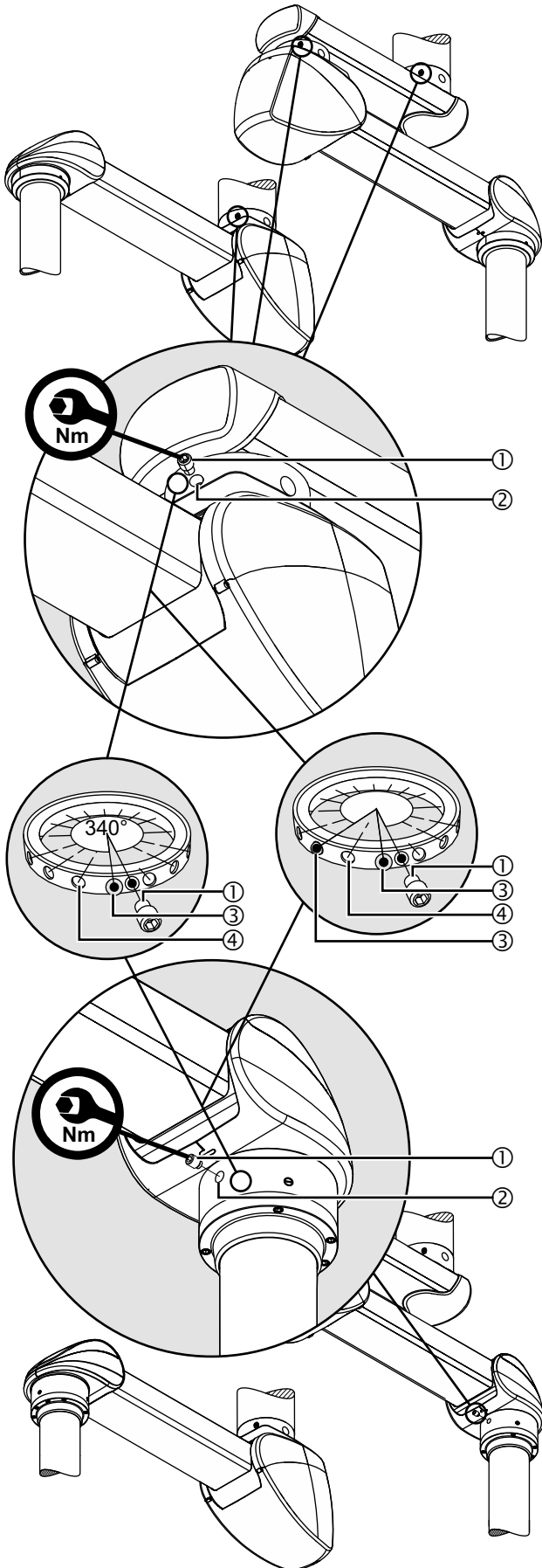
When adjusting the end stop as illustrated in Figure 68, the dead centre area is 45°. This means that the motor arm of the pendant system extension arm with motor arm (5) has a maximum movement range of approx. 315°.

If the minimum adjustment on the end stop is not defined whereas the brakes on the intermediate bearing (10) and the ceiling bearing (9) are adjusted, it is rather difficult to bend the pendant system from the stretched position (11) and rotate it on the intermediate bearing (10) of the pendant system.

When moving the adaption on the Drop tube (7) from the stretched position (11), there is a risk that the extension arm and the motor arm rotate around the ceiling bearing (9) even though bending in the area of the intermediate bearing (10) would be required.

For more details on how to mount the swivel stop refer to Chapter 15.8.3, on Page 86.

Figure 69: Mounting the swivel stop



### 15.8.3 Mounting the swivel stop

(See "Figure 69")

1. Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.
2. Unscrew a setscrew ① from the threaded hole ② .
3. Rotate the extension arm, motor arm or Drop tube 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

The extension arm, motor arm or the Drop tube can be rotated once the ball stop ③ has been completely inserted into one of the mounting fixtures ④ . Otherwise, these are blocked and the ball stop ③ must be pushed into one of the mounting fixtures ④ whilst gently rotating the extension arm, motor arm or Drop tube using a screwdriver.

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

#### ⚠ WARNING



#### Risk of internal supply cables twisting off

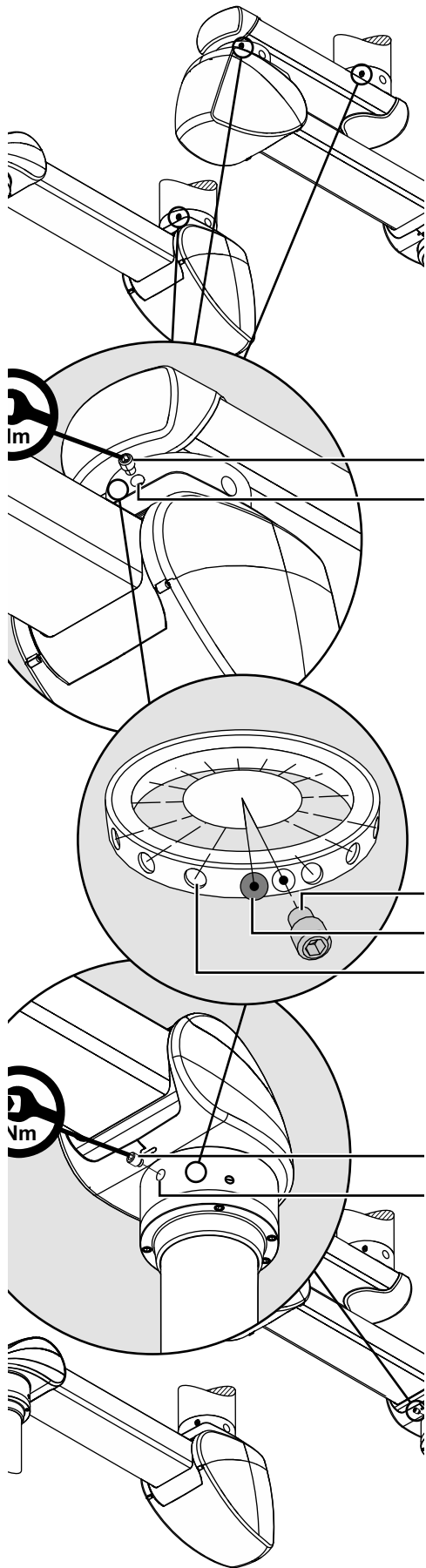
The swivel stop can fail if the fixing elements have not been properly tightened, and the supply cables can twist off:

- Tighten the setscrew ① to 40Nm.

6. Tighten the setscrew ① to 40Nm.
7. To check that the swivel stop operates securely:
  - The swivel range of the extension arm, motor arm and Drop tube must be restricted to less than 360 degrees.

To change a mounted ball stop ③ , refer to Chapter 15.8.4, "Changing or dismantling the swivel stop", on Page 87.

(See "Figure 70")



1. Follow the general safety instructions prescribed in Chapter 15.1, on Page 77.
2. Unscrew a setscrew ① from the threaded hole ② .
3. Rotate the extension arm, motor arm or Drop tube until the ball stop ③ in the threaded hole ② is visible.
4. Using a telescopic magnetic 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 ball stop serves as twist protection:**

- Mount the swivel stop directly afterwards.
- To restrict the angle of rotation of the extension arm, motor arm or Drop tube to 340 degrees, mount at least 1 ball stop ④ as described in Chapter 15.8.3, on Page 86.

5. Mount the swivel stop as described in Chapter 15.8.2, on Page 85 and Chapter 15.8.3, on Page 86.

- Initial commissioning
1. The pendant system must be properly installed. Instructions for installation are included in the scope of delivery of the product.
  2. For commissioning following installation, proper initial commissioning must be carried out for the entire pendant system.
- Functional test
- Prior to using the pendant system and 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.
- This requirement is considered fulfilled if:
1. the functional reliability of the pendant system and the Navigator M6 is ensured.
  2. the maximum permissible loading capacity (payload) has been safely determined and is indicated on a label attached to the Navigator M6.
  3. the proper functioning of the device has been approved by the operator during initial commissioning and documented by signing a test report in accordance with Appendix G DIN EN 62353.
- The following points must be observed during handover to the operator:
1. The pendant system and the Navigator M6 must not be handed over to the operator until they have been tested.
  2. Handover must be documented in writing including confirmation by the operator.
  3. On handover, the operator must be instructed in the functioning and effect of the maximum loading capacity (payload).
  4. In addition, the operator must be instructed in the functioning, operation, cleaning and disinfection of the pendant system and the Navigator M6 during the handover procedure.
  5. Furthermore, on handover, the operator must be instructed in the adjustments permitted according to the Operating Instructions included in the scope of delivery.
  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.

## 17 Technical Description

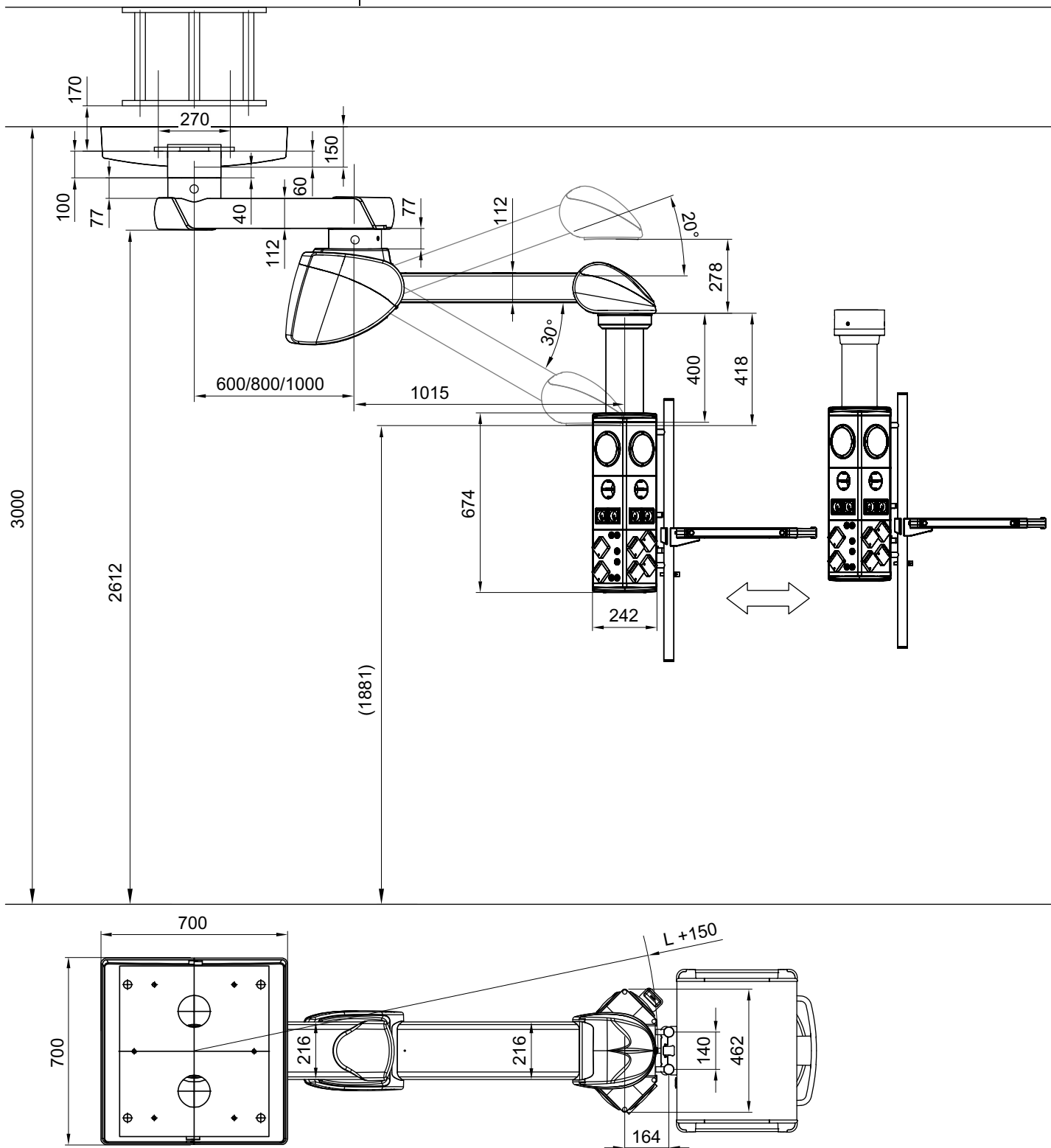
Figure 71: Motor arm Navigator Lift™ 150 / 250 AirPlus / Navigator Lift™ 150 / 250 Friction – Single-arm variant with Navigator M6

The Figure illustrates the extension arm with motor arm Navigator Lift™ 150 / 250 AirPlus with Navigator M6 as an example. Please note that your individual pendant system configuration can differ from the illustration. 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.



Figure 72: Extension arm with motor arm Navigator Lift™ 150 AirPlus / Navigator Lift™ 150 Friction – Dual-arm variant with Navigator M6

The Figure illustrates the extension arm with motor arm Navigator Lift™ 150 AirPlus with Navigator M6 as an example. Please note that your individual pendant system configuration can differ from the illustration. 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™ 150 AirPlusSingle, Navigator Lift™ 250 AirPlus Single, Navigator Lift™ 150 AirPlus Dual, Navigator Lift™ 150 Friction Single, Navigator Lift™ 250 Friction Single and Navigator Lift™ 150 Friction Dual are suitable for continuous operation.</li> </ul>
Duty cycle of the height adjustment mechanism	<ul style="list-style-type: none"> <li>The maximum duty cycle of the height adjustment mechanism on the motor arm must not exceed 3 minutes:                     <ul style="list-style-type: none"> <li>If the height adjustment mechanism is actuated over a longer period of time, the electric motor of the motor arm may switch off automatically as a protection measure against overheating.</li> <li>In order to prevent an overload of the electric motor, make sure you wait at least 30 minutes after actuating the height adjustment mechanism before putting the height adjustment mechanism back into operation. Afterwards the height adjustment mechanism can be operated once again for 3 minutes.</li> </ul> </li> </ul>
Duty cycle of the electropneumatic brakes	<ul style="list-style-type: none"> <li>The maximum duty cycle of the electropneumatic brakes must not exceed 3 minutes:</li> </ul>
Rating plate	<ul style="list-style-type: none"> <li>The rating plates are attached to the top side of the extension arm and under the front cover of the motor arm (see Chapter 2.8, on Page 21).</li> </ul>
Dead weight of the pendant system*	<p>Motor arm 150 / 250 (1015 mm long) .....58kg</p> <p>Extension arm 600mm with motor arm 150 (1015 mm long).....83kg</p> <p>Extension arm 800mm with motor arm 150 (1015 mm long).....86kg</p> <p>Extension arm 1000mm with motor arm 150 (1015 mm long).....89kg</p> <p>* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.</p>
Dead weight of the ceiling tube for the extension arm	<p>Flange .....6kg</p> <p>Steel tube .....24kg/m</p>
Dead weights of the bearing units on the Drop tube	<p>Bearing Unit Friction (slide bearing).....5kg</p> <p>Bearing Unit Friction (roller bearing) .....13kg</p>
Dead weight of the Drop tube	<p>Drop tube .....8kg/m</p>
Maximum loading capacity on the pendant system	<p>Motor arm 150 (1015mm long) .....150kg</p> <p>Motor arm 250 (1015mm long) .....250kg</p> <p>Extension arm, 600mm, with motor arm 150 (1015mm long) .....150kg</p> <p>Extension arm, 800mm, with motor arm 150 (1015mm long) .....150kg</p> <p>Extension arm, 1000mm, with motor arm 150 (1015mm long) .....150kg</p>
Electrical data	<p>Rated voltage.....AC 100V-120V and AC 220V-240V</p> <p>Rated frequency .....60 / 50Hz</p> <p>Rated voltage at AC 100V-120V .....10A</p> <p>Rated voltage at AC 220V-240V .....5A</p> <p>Indirect extension arm lighting .....DC 12V</p>

	2 / 4 lighting boards (supply voltage 12V DC, 2 lighting boards each connected in series to 24V DC)
Brakes on the extension arm, motor arm and Drop tube	Navigator Lift™ 150 / 250 <i>AirPlus</i> ..... Electropneumatic brake Navigator Lift™ 150 / 250 Friction ..... Mechanical brake Drop tube ..... Mechanical brake Maximum operating pressure of the electropneumatic brakes..... 5 bar
Noise level	Sound energy level ..... 65dB(A (EN ISO 3746) not exceeded
Brake torque	Brake torque with the electropneumatic brake actuated ..... approx. 50Nm
Manual forces	Dynamic torque with the electropneumatic 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	The following Nuvo products are approved as adaptations to the pendant system: <ul style="list-style-type: none"> <li>• Chapter 19, “Electromagnetic Compatibility (EMC) Information”, on Page 93,</li> <li>• Chapter 21, “Optional Accessories”, on Page 98,</li> <li>• Chapter 22, “Possible Combination with Third-Party Products”, on Page 98:</li> <li>– The components have been adapted to each other and are 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 from third-party manufacturers. To prevent dangerous overload which can lead to a failure or collapse of the pendant system, the maximum load bearing capacity specified in Chapter 18, “Technical Data”, on Page 91 must be adhered to:</li> <li>– The party placing the device 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>

## 19 Electromagnetic Compatibility (EMC) Information

### 19.1 Guidelines and manufacturer's declarations

#### 19.1.1 Electromagnetic emissions

The Navigator Lift™ 150 / 250 is intended for use in the ELECTROMAGNETIC ENVIRONMENT specified below. The customer or the user of the Navigator Lift™ 150 / 250 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™ 150 / 250 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™ 150 / 250 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™ 150 / 250 is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator Lift™ 150 / 250 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™ 150 / 250 is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator Lift™ 150 / 250 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
<p>NOTE 1 At 80 MHz and 800 MHz, the higher value applies.</p> <p>NOTE 2 These guidelines may not apply in all cases. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>		
<p><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™ 150 / 250 is used exceeds the applicable RF compliance level above, the Navigator Lift™ 150 / 250 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™ 150 / 250.</p> <p><sup>b</sup> Field strengths over the 150 kHz to 80 MHz frequency range should be less than 3 V/m.</p>		

### 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™ 150 / 250 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.

## 20 Approved Nuvo Products

Designation
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	2.0kg	---
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 device 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.

Notes





**Medical Illumination**

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