

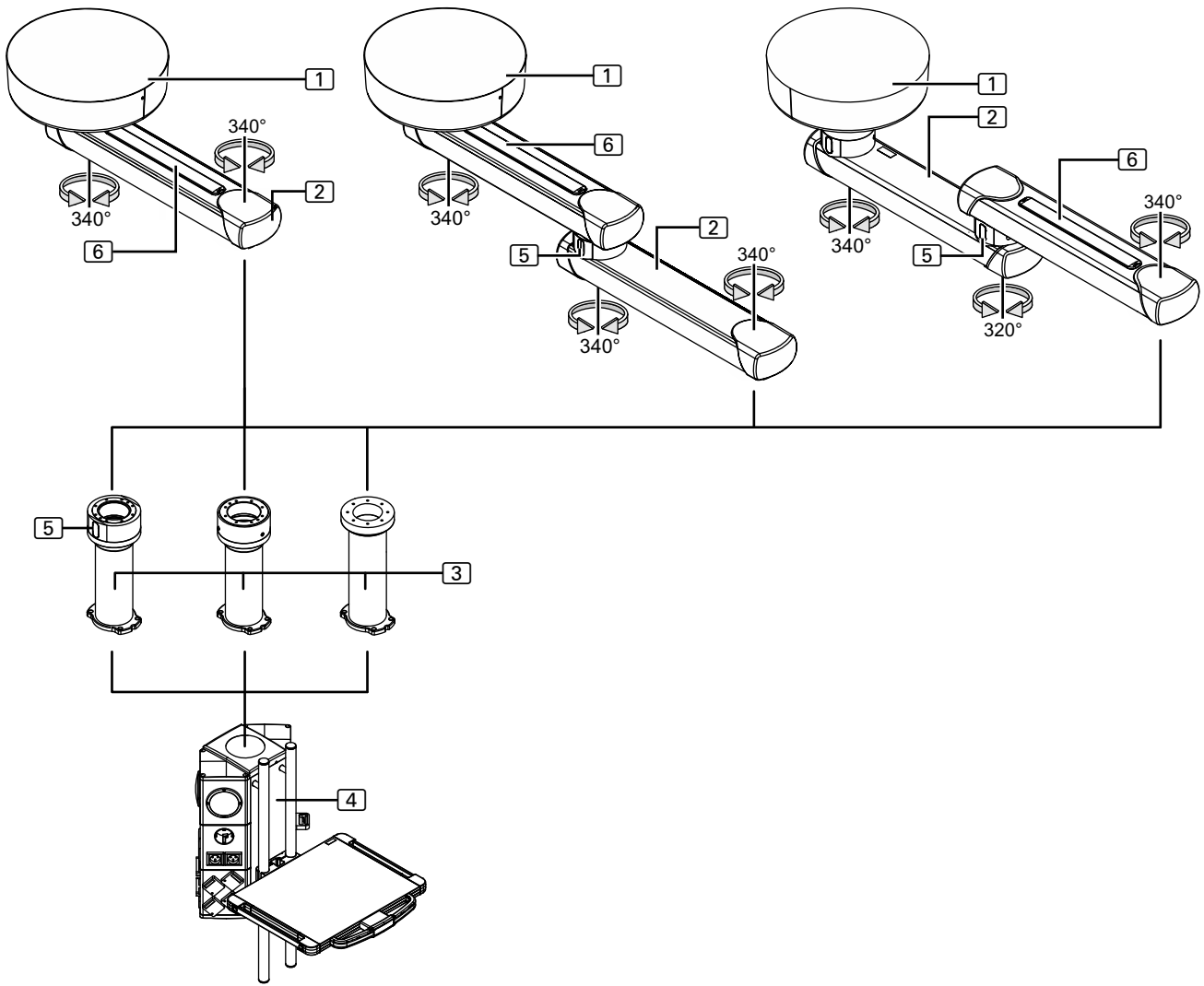


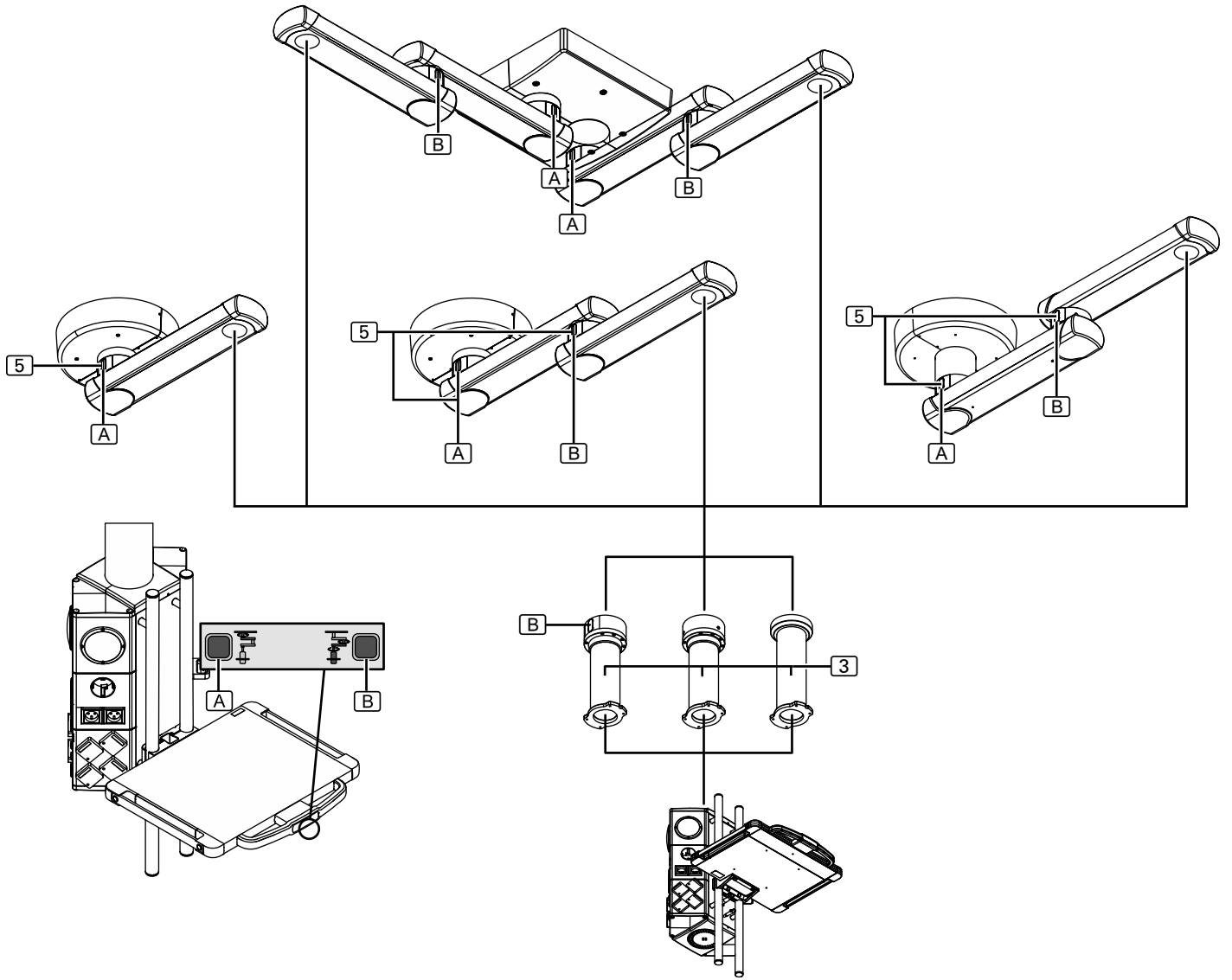
Operating Instructions [EN]

Navigator™, Navigator™ Friction, Navigator™ – Inverted, Navigator™ XL, Navigator™ XXL,
Navigator™ Air, Navigator™ AirPlus



A member of the
Medical Illumination International Group





The Figure shows the Navigator™ and Navigator™ – Inverted version as an example.

- ① Canopy
- ② Extension arm
 - Single- and dual-arm variant, different lengths available
- ③ Drop tube
 - The Drop tube ③ has a variable length for compensating different ceiling heights.
- ④ Navigator M6
 - (For more detailed information on the Navigator M6 ④ refer to the Operating Instructions included in the scope of delivery of the Navigator M6).

Optional equipment of the Navigator™, Navigator™ – Inverted, Navigator™ XL, and Navigator™ XXL pendant systems

- ⑤ BrakeGuide on the pivot point of the extension arm ②
 - The corresponding BrakeGuide ⑤ on the pivot point of the extension arm lights up when releasing the brake ①, ② by pressing the brake button ①, ② on the Navigator M6 ④
 - Pendant system – Dual arm type
 - The BrakeGuide ⑤ on the pivot point of the upper extension arm lights up green
 - The BrakeGuide ⑤ on the pivot point of the lower extension arm lights up blue
 - Pendant system – Single arm type
 - The BrakeGuide ⑤ on the pivot point of the extension arm lights up green
- ⑤ BrakeGuide on the pivot point of the Drop tube ③
 - (optional for the pendant systems Navigator™ XL and Navigator™ XXL)
 - The corresponding BrakeGuide ⑤ on the Drop tube lights up blue when releasing the brake ① by pressing the brake button ① on the Navigator M6 ④.

Optional equipment only for the pendant systems Navigator™ Air and Navigator™ AirPlus: Without the BrakeGuide ⑤, labels in different colours are attached to the pivot point of the extension arm in order to be able to locate brake ①, ② actuated by pushing the corresponding brake button ①, ②:

- Pendant system – Dual arm type
 - The label on the pivot point of the upper extension arm is green
 - The label on the pivot point of the lower extension arm is blue
- Pendant system – Single arm type
 - The label on the pivot point of the extension arm is green

Optional equipment of the Navigator™, Navigator™ – Inverted, Navigator™ Friction, Navigator™ XL, Navigator™ XXL, Navigator™ Air, and Navigator™ AirPlus pendant systems

- ⑥ Indirect extension arm lighting (SurroundLED basic C) on the extension arms
 - extension arm lighting ⑥ with on/off switch on the Navigator M6 ④

Thank you very much for purchasing this Nuvo product. Please read these Operating Instructions very carefully, abide by the safety notices and observe all operating and cleaning requirements.

For which appliances do these Operating Instructions apply?

- Pendant system Navigator™, Navigator™ – Inverted, Pendant system Navigator™ Friction, Pendant system Navigator™ XL, Navigator™ XXL, Pendant system Navigator™ Air, Navigator™ Air*Plus*
 - Single type – single-arm and dual-arm
 - Duo type and combinations – single-arm and dual-arm

Please do not hesitate to contact our Customer Service team

if you have any questions about the appliance and its installation, and also in service or warranty cases.

Manufacturer and marketer

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Supplier's address



Space for supplier's stamp or label

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- Any other use than that regulated by law must be approved in writing by Nuvo Surgical, hereinafter referred to as Nuvo.
- Nuvo does not take any liability for or in relation to the misuse of this information in the prohibited manner by any person or company.

Modifications to the appliance

Modifications and translations

- Nuvo products are subject to continuous further development. Nuvo reserves the right to modify the form, equipment and technology of the scope of supply without prior notice.

Modifications to the Operating Instructions

- The contents of these Operating Instructions are subject to change without prior notice.

Translations

- In case of translations into foreign languages, the German version of these Operating Instructions shall take precedence.

Trademarks

- All trademarks mentioned in these Operating Instructions are the sole and exclusive property of the corresponding manufacturer.

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Device identification

1.1 Information for identification of the device

- These Operating Instructions are intended solely for devices with the manufacturer's rating plate bearing the following information:
 - Type designation: Pendant system Navigator™, Navigator™ Friction, Navigator™ – Inverted, Navigator™ XL, Navigator™ XXL, Navigator™ Air, Navigator™ AirPlus

The rating plate is attached to the upper extension arm.



Make sure you are using the latest version

Identification of these Operating Instructions

1.2 How to identify the Operating Instructions

- To ensure that you always have the latest version of these Operating Instructions, all pages bear a 7-digit identity number including the date of issue and the version number:
 - Edition: 2019-04
- This identification is binding for the validity of the Operating Instructions and must not be removed, regardless of the type of publication (printed form, electronic form or excerpts).



1.3 Identification of target groups

The groups of persons described below are mentioned in these Operating Instructions.

1.3.1 Operator

The following natural persons or legal entities shall be considered as operators:

- all persons who use the device in a medical practice, hospital, etc. or hand over the device to third parties for use/application, and who have actual physical authority over the device during operation.
- The operator shall be liable for handing over a safe device and for instructing the user in its proper operation and normal use.

1.3.2 User

The following persons shall be considered as users:

- persons who, due to their professional qualification and instruction by the persons designated by the operator, are authorised to operate the device and to work with it.
- Users shall be fully responsible for the safe operation of the device in accordance with its intended purpose.

1.3.3 Qualified personnel

The following persons shall be considered as qualified personnel:

- persons who underwent special professional training in the field of medicine or medical engineering,
- 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.
- In States where the performance of tasks in the medical or medical engineering sector is subject to certification, qualified personnel must have obtained the corresponding certificate.



1.4 Notes for the operator

- Even though the device has been designed according to the state of the art and is safe to operate, the device must be considered a potential source of danger, in particular when operated by insufficiently trained personnel or used improperly and not as prescribed.
- The device may only be operated, cleaned and disinfected by trained qualified personnel.
- All the mounting, dismantling and adjustment work described in these Operating Instructions may only be carried out by qualified personnel who have been authorised and instructed by the operator.
- For safety reasons, any operator actions or interventions exceeding this scope may only be carried out by Nuvo or companies authorised by Nuvo. As a prerequisite for the authorisation of a company, its service technicians must have successfully participated in technical training organised by Nuvo. This authorisation is granted for a limited period.
- All lengths (mm) and angles (degrees) are approximate values and subject to production-related tolerances.

1.4.1 Initial commissioning

Validity

- These Operating Instructions only apply after initial commissioning has been carried out properly.
- Prior to initial use, the device must be thoroughly cleaned and disinfected.
- The instruction for the proper installation of the device is included in the Installation Instructions applicable for the device.

1.4.2 Availability of these Operating Instructions

Duty to inform

- Since these Operating Instructions are an integral part of the device, they must always be kept near the device in order to be able to look up safety instructions and important information on use at any time.
- Do not pass on the device to any third party without valid Operating Instructions. Based on the ID and version numbers, make sure you hand over an up-to-date and valid version of the Operating Instructions together with the device.

1.4.3 Warranty

The warranty of Nuvo for the safety and operational reliability of the device is subject to the following conditions:

- the device is used exclusively as prescribed and operated as stipulated in these Operating Instructions.
- 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.
- no structural alterations are made to the device. Unauthorised modifications or conversions to device are not permitted for safety reasons.
- inspections and maintenance are carried out at the specified time intervals.
- initial commissioning has been carried out and the device has been released for operation by means of a declaration of acceptance.



1.5 Notes for the user

- All the steps described in these Operating Instructions may only be carried out by qualified personnel who have been authorised and instructed by the operator.

1.5.1 Instruction on the device

Instruction

- The instruction must be carried out on the device immediately by Nuvo, by a company authorised by Nuvo or by a person designated by the operator.
- On completion of the instruction, a certificate must be created and signed in order to document that the user has understood the special operator control actions required for normal use.

1.5.2 User's duty to inform and inspect

Duty to inform and inspect

- Read these Operating Instructions carefully prior to installation of the device. This ensures that you benefit from all the advantages of the device and prevents any risk of injury or damage to property.
- Prior to any use or transfer for use, the functional reliability and proper condition of the device must be inspected by the user.
- In case of special problems which are not sufficiently described in detail in these Operating Instructions, contact your supplier for your own safety.

Troubleshooting

1.5.3 Marking

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

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

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

1.5.4 Standards and directives

The device complies with the safety requirements of the following standards, laws and directives:

- Medical Devices Act (MPG)
- 93/42 EEC (Medical Device Directive)
- IEC 60601-1 – Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance





1.6 Intended purpose

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

Qualified personnel

- The pendant system may only be operated by instructed, qualified medical personnel.
- The pendant system may only be cleaned and disinfected by instructed hygiene specialists.
- Maintenance work on the pendant system must be carried out by the operator's technical specialist personnel in accordance with the applicable instruction document.

1.6.1 Incorrect use

- The maximum load bearing capacity of the pendant system and its components as specified in Chapter 12, "Technical Data", on Page 43 must not be exceeded.

1.6.2 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.



1.7 Ambient conditions

1.7.1 Ambient conditions for storage and transport

The following conditions apply to storage:

- Ambient temperature: -25 °C to 70 °C
- Relative humidity: 10 % to 75 %
- Atmospheric pressure: 500 hPa to 1,060 hPa

1.7.2 Ambient conditions for operation

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



1.8 Approved Nuvo products

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

- Nuvo products in accordance with Chapter 14, "Approved Nuvo Products", on Page 54
- The components are adapted to each other and safe to operate. Any other type of installation, and in particular the use of components from third-party manufacturers, is strictly prohibited because these components can be potential sources of danger.
- The combination of any other Nuvo product with the pendant system must be approved by Nuvo. If applicable, the conformity assessment must be repeated.



Read the Operating Instructions for combined medical products

1.9 Combination with products of other manufacturers

- The pendant system is combined with the Navigator M6. To prevent dangerous overload, which can damage or lead to a collapse of the Navigator M6 and the pendant system, the maximum load bearing capacity specified in Chapter 12, "Technical Data", on Page 43 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.
- Read the Operating Instructions provided by the third-party manufacturer to obtain the information required for the operation of the end device.
- Power packs intended for the supply of end devices must ensure electrical isolation and provide two protective measures in accordance with IEC 60601-1.

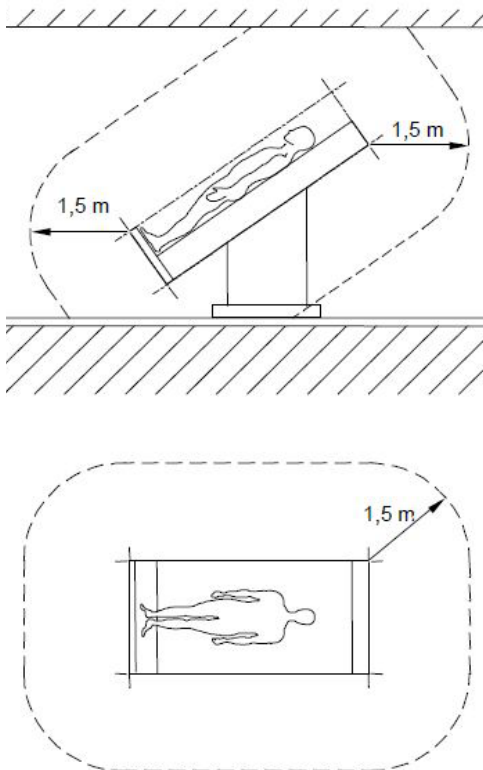


1.10 Patient environment

(See "Figure 1")

- If medical electrical devices with tangible parts are attached to the pendant system and if these are positioned within the patient environment, they must provide two Means Of Operator Protection (MOOP) in accordance with IEC 60601-1.
- If tangible parts are positioned outside the patient environment, two Means Of Operator Protection (MOOP) in accordance with IEC 60601-1 must be provided.
- The dimensions in the Figure illustrate the minimum extension of the patient environment in an unrestricted area.

Figure 1: Patient environment, illustration A.9 from IEC 60601-1



 **DANGER**
 **WARNING**
 **CAUTION**
*NOTICE*NOTE

2.1 Structure of the safety instructions

2.1.1 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 different 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.

2.1.2 Warnings of damage to property

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

2.1.3 Indication of additional information

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

2.2 Supplementary symbols used in the safety instructions

Explosion hazard: warns of the improper use of oxygen (see Chapter 2.7, "Proper use of oxygen", on Page 20).

Danger of fire: warns of the improper use of oxygen (see Chapter 2.7, "Proper use of oxygen", on Page 20).

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

Risk of parts falling off: warns of parts falling off while carrying out mounting or dismantling work underneath the pendant system.

2.3 Graphic symbols on the device and/or on the packaging

Observe the Operating Instructions: Read the Operating 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 of handling the pendant system with care.

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

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

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

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

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

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

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

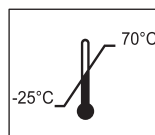
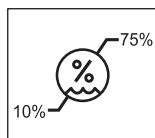
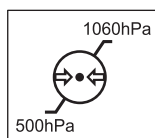
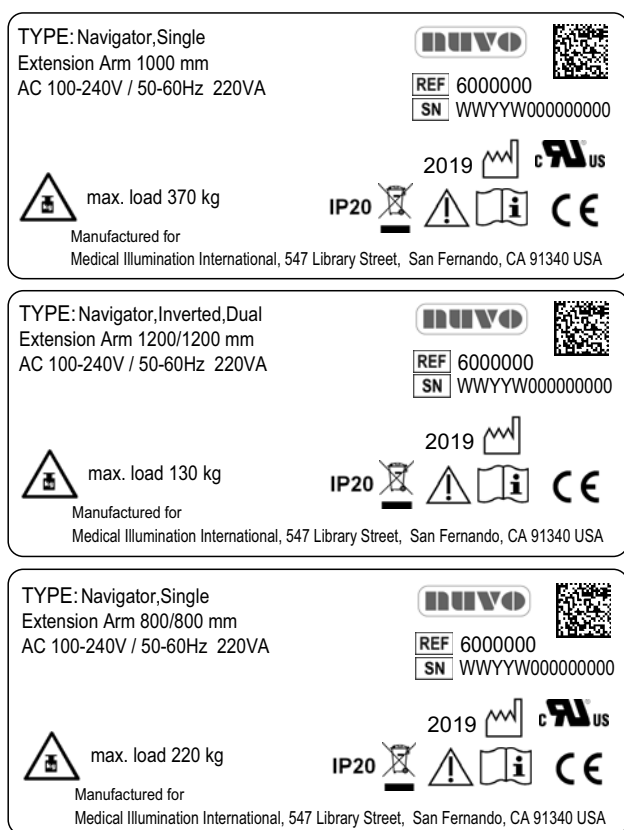


Figure 2: Information on the rating plate



2.4 Information on the rating plate

(See "Figure 2")

The Figure shows rating plates of the Navigator™ version as an example. The rating plates of further versions are identical.

- They are located on the top side of the extension arms.

Serial number

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

Power supply

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

Load bearing capacity

- The value of up to 370kg, 130kg or 220kg indicates the maximum permissible load bearing capacity of the extension arm.

Date of manufacture

- The digits 1 to 4 of the serial number (SN) indicate the date of manufacture of the pendant system.
 - The first two digits indicate the week of manufacture, e.g. 11 = calendar week 11.
 - The following two digits indicate the year of manufacture, e.g. 14 = 2014.
 - The letter in the 5th position indicates the factory, e.g. H = Hünfeld.
 - The digits following the letter indicate the serial number.
- The information and illustrations serve as examples.
- The information and illustrations on the rating plate can vary.

2.5 Overview of the most important safety instructions

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

2.5.1 Operation

WARNING



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 load bearing capacity of the pendant system and components thereof must not be exceeded (see Chapter 12, "Technical Data", on Page 43)!
- Do not attach or mount any additional loads to the extension arms, Navigator M6 and end devices.

Collision damage

In case of collision with other devices, walls or ceilings, the pendant system and the Navigator M6 can be damaged and important patient care systems can fail:

- After a collision, the Navigator M6 and the pendant system must be inspected for damage.
- In case of doubt, contact your supplier.

2.5.2 Mounting / dismantling

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.

Electric shock hazard

Power supply cables are laid in the pendant system and in the Navigator M6. Contact with energised components presents a danger to life from electric shock. Prior to any installation/dismantling 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 switched back on again.
- Make sure that all the devices connected via the Navigator M6 are de-energised.

WARNING



Risk of parts falling off

During all dismantling and installation work, it must be ensured that no person is in the area underneath the pendant system.

2.5.3 Cleaning and Disinfection

Cleaning

WARNING

Risk of contamination and infection of the patient

Parts of the pendant system and the adaptations are made of plastic. Solvents can dissolve plastic materials. Strong acids, bases and agents with an alcoholic strength of more than 60 % can lead to the plastic materials becoming brittle. Detached particles can fall into open wounds. If liquid cleaning agents are allowed to penetrate the pendant system and the adaptations, excess cleaning liquid may drip into open wounds.

Disinfection

CAUTION

Health hazard

Disinfectants can contain substances hazardous to health which, when in contact with the skin and eyes, can cause injuries or affect the respiratory organs when inhaled. Observe the protective measures:

- Observe the hygiene regulations.
- Adhere to the disinfectant manufacturer's instructions.
- Perform surface disinfection every working day and in case of contamination.

2.5.4 Maintenance work

WARNING



Electric shock hazard

Power supply cables are laid in the pendant system and in the Navigator M6. Contact with energised components presents a danger to life from electric shock. Disconnect the pendant system from the mains before any maintenance work:

- Disconnect all the poles from the mains and prevent the device from being switched back on again.
- Make sure that all the devices connected via the Navigator M6 are de-energised.

CAUTION

Maintenance work

- The pendant system must be checked as described in Chapter 16, "Inspection plan".
- In case of failure or damage, please contact your supplier.

2.6 Warranty

WARNING



Pendant system dropping

The pendant system and the Navigator M6 are an adapted system with regard to the maximum load bearing capacity. Alterations to the pendant system can result in exceeding the permissible, total or maximum load bearing 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 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 adaptations and the spring arms 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.

2.7 Proper use of oxygen

DANGER



Oxygen explosion

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

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



Danger of fire

Escaping oxygen is combustible:

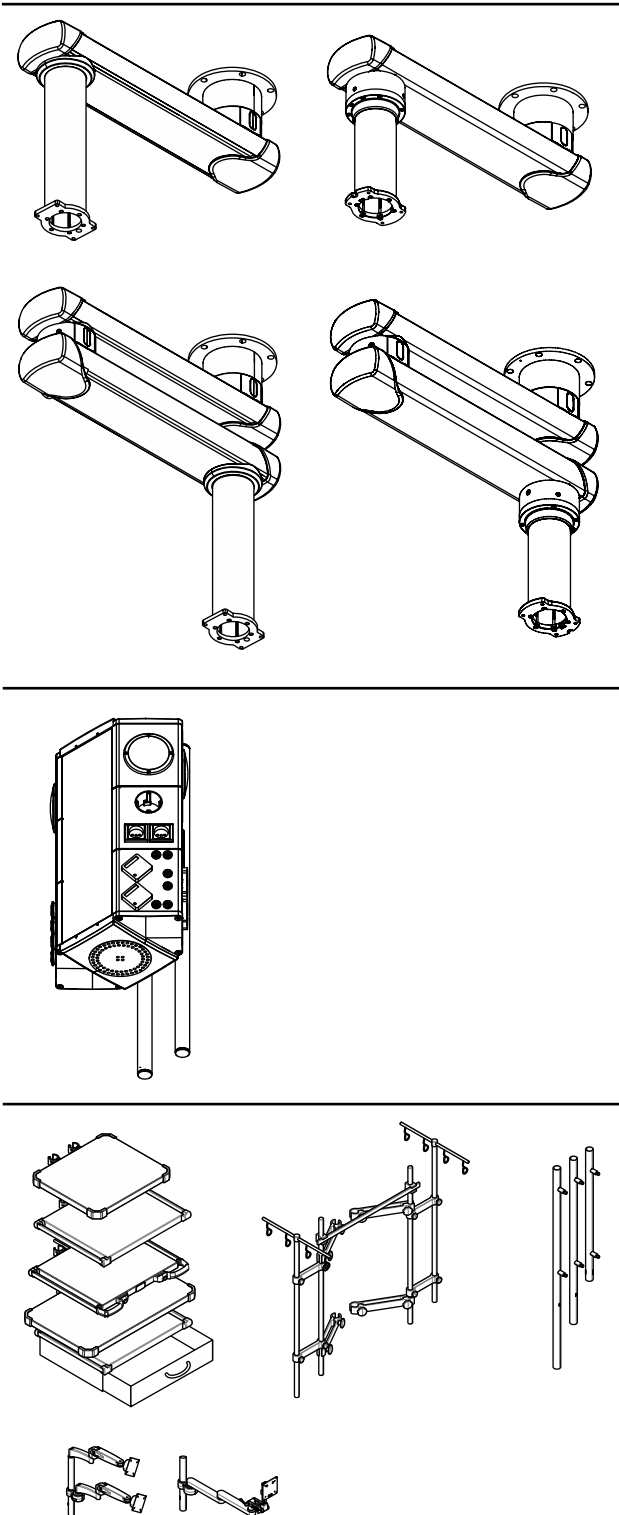
- Open fire, red hot objects and open light are not permitted when working with oxygen!
- Do not smoke!

2.8 Disposal

RoHS conformity

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

Figure 3: Overview of the structure of the Operating Instructions



The Operating Instructions of the entire pendant system consist of separate documents. For this reason these Operating 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: pendant system (example of Navigator™)

Part 02: Navigator M6
(Observe the Operating Instructions of the gas outlets installed)

Part 03: Accessories approved for the Navigator M6, see accessories catalogue

4.1 Device description

Canopy	Since the points for connecting the electrical cables of the pendant system are located under the canopy [1], the canopy [1] may only be removed by specialist personnel authorised by the operator.
Extension arm (single- and dual-arm variants)	The extension arm [2] can be rotated up to 340 degrees horizontally. For the version Navigator™ – Inverted the lower extension arm can be rotated 320 degrees.
Drop tube	The length R_L of the Drop tube [3] compensates different ceiling heights in order to ensure that the Navigator M6 [4] is positioned at the working height desired.
Navigator M6	The Navigator M6 [4] can be rotated 340 degrees horizontally (for more detailed information on the Navigator M6 [4] refer to the Operating Instructions of the Navigator M6).

4.2 Functional description

Extension arm (single- and dual-arm variants)	The extension arm [2] serves for the horizontal positioning of the Navigator M6 [4].
End stops on the extension arm and the Drop tube	In order to prevent collisions with other components or walls, the swivel range of the extension arms [2] and the Drop tube with roller bearing [3] can be restricted by means of internal end stops. The end stops of the extension arms [2] and the Drop tube with roller bearing [3] are pre-adjusted at the factory. They can be re-adjusted as described in Chapter 7.4 on Page 28.
Brake on the extension arm	<p>Pendant systems Navigator™, Navigator™ – Inverted: The extension arm [2] is equipped with an electromagnetic brake [A], [B] in order to keep the extension arms [2] stable in any adjusted position.</p> <p>Pendant system Navigator™ Friction: The extension arm [2] is equipped with a mechanical brake in order to keep the extension arms [2] stable in any adjusted position. The mechanical brake can be adjusted as described in Chapter 7.2.2 on Page 26.</p> <p>Pendant systems Navigator™ XL, Navigator™ XXL: The extension arm [2] is equipped with an electromagnetic brake [A], [B] in order to keep the extension arms [2] stable in any adjusted position.</p> <p>Pendant systems Navigator™ Air and Navigator™ AirPlus: The extension arm [2] is equipped with a pneumatic (compressed air operated) brake [A], [B]. The additional mechanical brakes (friction brakes) ensure that the extension arms [2] remain stable at the bearing point towards the ceiling tube and between the extension arms (Dual arm type only) in the case of a failure of the pneumatic (compressed air operated) brake [A], [B]. The mechanical brake can be adjusted as described in Chapter 7.2.1 on Page 26.</p>
Brake on the Drop tube	The Drop tube [3] is equipped with a mechanical or electromagnetic brake (optional for the pendant systems Navigator™ XL, Navigator™ XXL) in order to keep the Navigator M6 [4] stable in any adjusted position. The mechanical brake can be adjusted as described in Chapter 7.3 on Page 27.
BrakeGuide on the Drop tube (optional)	Only pendant systems Navigator™ XL, Navigator™ XXL: When releasing the brake [B] by pressing the corresponding brake button [B] on the Navigator M6 [4], its BrakeGuide [5] lights up blue on the Drop tube.
BrakeGuide on the extension arm (optional)	<p>Only pendant systems Navigator™, Navigator™ – Inverted, Navigator™ XL, Navigator™ XXL: When releasing the brake [A], [B] by pressing the corresponding brake button [A], [B] on the Navigator M6 [4], its BrakeGuide [5] on the pivot point of the extension arm lights up:</p> <p>Pendant system Navigator™, Navigator™ – Inverted, Navigator™ XL, Navigator™ XXL, Dual arm type</p> <ul style="list-style-type: none"> – The BrakeGuide [5] on the pivot point of the upper extension arm lights up green – The BrakeGuide [5] on the pivot point of the lower extension arm lights up blue <p>Pendant system Navigator™, Navigator™ XL, Navigator™ XXL, Single arm type:</p> <ul style="list-style-type: none"> – The BrakeGuide [5] on the pivot point of the extension arm lights up green
Extension arm lighting (optional)	Indirect extension arm lighting [6] (SurroundLED basic C) on the extension arms <ul style="list-style-type: none"> • The extension arm lighting [6] is switched on and off via either the on/off switch or a rotary dimmer switch (SurroundLED advanced system) in the light module of the Navigator M6 [4].

Figure 4: What is the maximum load bearing capacity?

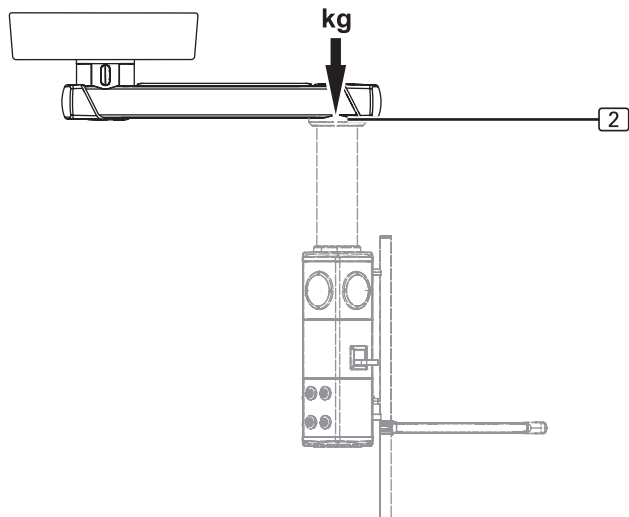
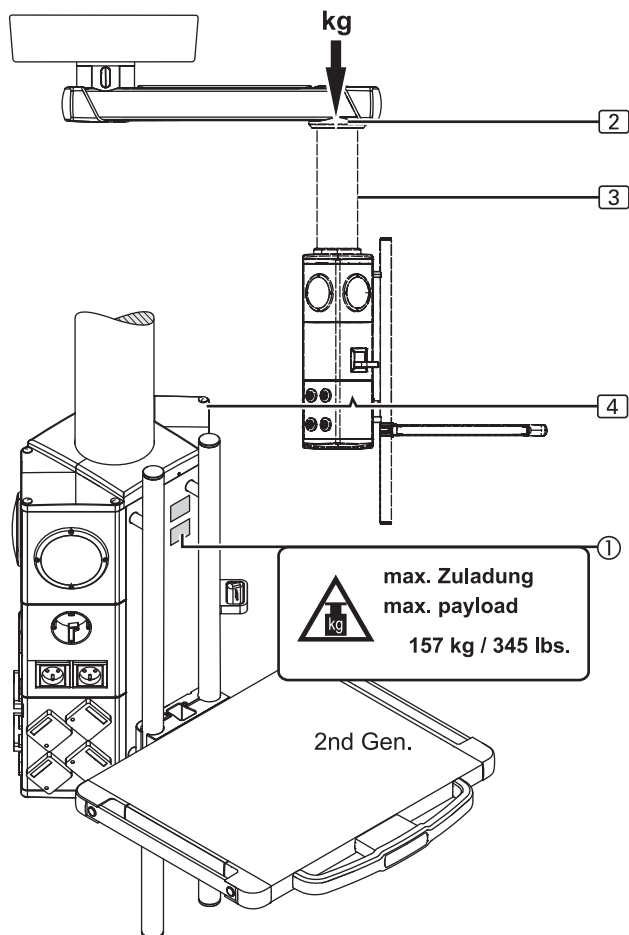


Figure 5: What is the maximum loading capacity (payload)?



5.1 What is the maximum load bearing capacity?

(See "Figure 4")

The maximum load bearing capacity is the maximum weight which the extension arm (2) can carry. Table 01 indicates the maximum permissible load bearing capacity of the Single version, single-arm variant, on the extension arm (2) of the Navigator™ pendant system (as an example). To look up the maximum load bearing capacity of all pendant systems refer to Chapter 12, "Technical Data", on Page 43.

Table 01: Maximum load bearing capacity on the Navigator™ pendant system

Single-arm variants	Carrying load [kg]
Extension arm, 600mm	640
Extension arm, 800mm	470
Extension arm, 1,000mm	370
Extension arm, 1,200mm	300

5.2 What is the maximum loading capacity (payload)?

(See "Figure 5")

The dead weight of the Drop tube (3) and the Navigator M6 (4) must be subtracted from the maximum load bearing capacity of the pendant system.

This value corresponds to the maximum loading capacity (payload). In the example illustrated in the Figure, the maximum payload is 157kg / 345lbs. It is indicated on the adhesive label (1) on the Navigator M6 (4).

If the Drop tube (3) or the Navigator M6 (4) are replaced, the maximum loading capacity (payload) must be calculated again and indicated on the label (1) on the Navigator M6 (4).

For more detailed information on the maximum loading capacity (payload) refer to the Operating Instructions of the Navigator M6 (4).

5.3 Structural alterations to the pendant system

(See "Figure 5")

The pendant system is an adapted system with regard to the maximum load bearing capacity and the maximum loading capacity (payload). Alterations to the pendant system can result in exceeding the permissible, total loading capacity (payload) or maximum load bearing 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:

- For this reason, structural alterations to the pendant system, including the replacement of the Navigator M6 and the end devices (e.g. HF surgical device, flat screen, etc.), may only be carried out by specialist personnel authorised by the operator whilst taking the maximum load bearing capacity of the extension arm and the Navigator M6 into consideration.
- The pendant system may only be dismantled and mounted by the Nuvo technical service team or trained and authorised service personnel.
- Related documents for dismantling, mounting and adjustment work are available from Nuvo on request.

Initial commissioning	<ol style="list-style-type: none"> 1. The pendant system must be 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	<p>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.</p> <p>This requirement is considered fulfilled if:</p> <ol style="list-style-type: none"> 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. <p>The following points must be observed during handover to the operator:</p> <ol style="list-style-type: none"> 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.

7 Adjustments

7.1 General safety instructions

WARNING



Electric shock hazard

Power supply cables are laid in the pendant system. Contact with energised 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.

CAUTION

Performing adjustment work

Adjustment work may only be carried out by qualified personnel which have been authorised and instructed by the operator.

Figure 6: Adjusting the brake on the bearing unit
(only Navigator™ Air and Navigator™ AirPlus)

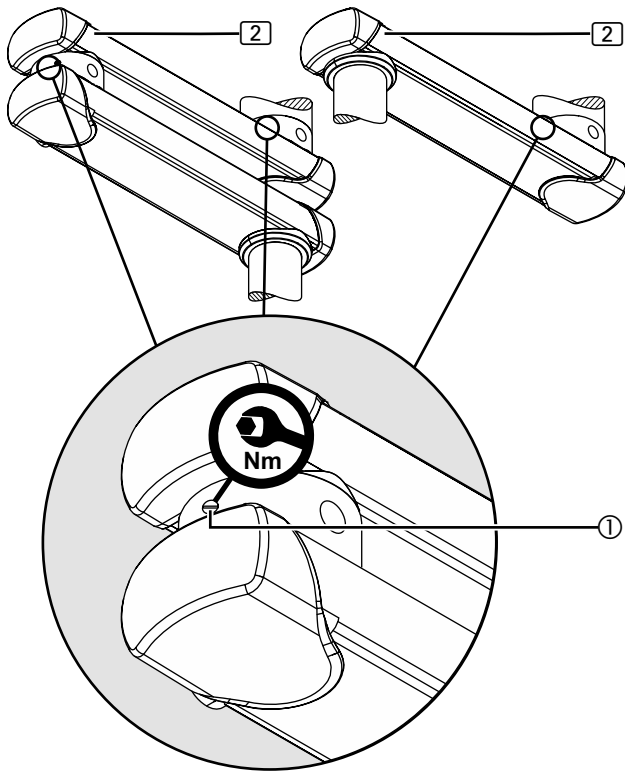
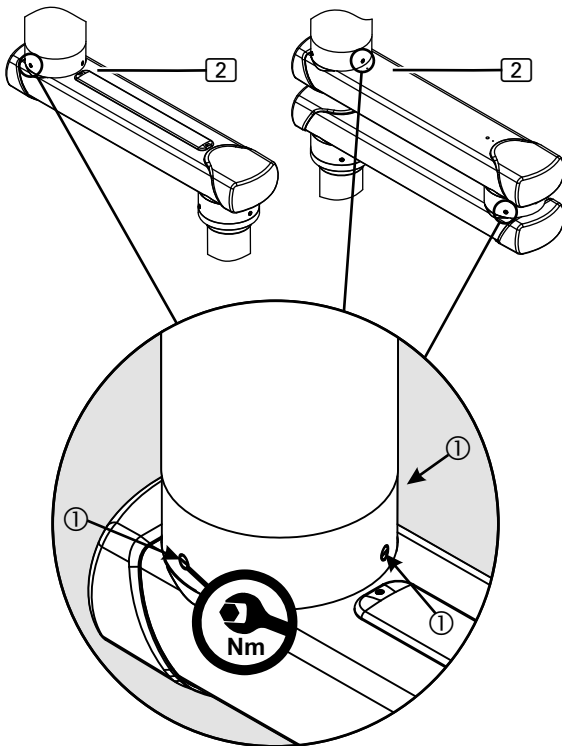


Figure 7: Adjusting the brake on the Bearing Unit Friction
(only Navigator™ Friction)



7.2 Adjusting the mechanical brake for the extension arm

7.2.1 Adjusting the brake on the bearing unit (only Navigator™ Air and Navigator™ AirPlus)

(See "Figure 6")

For these pendant system versions, the mechanical brakes (friction brakes) keep the extension arm [2] in any set position in the case of a failure of the pneumatic (compressed air operated) brakes. Adjust the braking force in such a way that the extension arm [2] remains stable in any position and can still be conveniently adjusted.

Follow the general safety instructions prescribed in Chapter 7.1 on Page 25.

- Tool to be used
 - Use a suitable torque spanner.
- To increase the brake 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
 - Unscrew the slotted brake screw ① by uniformly rotating it to the left (anti-clockwise).
- Perform a function test.

7.2.2 Adjusting the brake on the Bearing Unit Friction (only Navigator™ Friction)

(See "Figure 7")

For these pendant system versions, the mechanical brakes (friction brakes) keep the extension arm [2] in any set position.

Adjust the braking force in such a way that the extension arm [2] remains stable in any position and can still be conveniently adjusted. If the brakes are not adjusted correctly, the extension arm can move automatically in an uncontrolled manner.

NOTE: Adjusting the brakes for the Navigator™ Friction Dual

Observe the end stop recommendation in Chapter 7.4.4 on Page 30 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 lower extension arm. This facilitates the bending of the bottom extension arm and allows the bearing unit on the bottom extension arm to rotate freely. Follow the general safety instructions prescribed in Chapter 7.1 on Page 25.

- Tool to be used
 - Use a suitable torque spanner.
- To increase the brake 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, however, must not exceed 1.6 Nm.
- To reduce the brake force
 - Unscrew the slotted brake screws ① by uniformly rotating them to the left (anti-clockwise).
- Perform a function test.

Figure 8: Adjusting the brake on the Drop tube Friction (slide bearing)

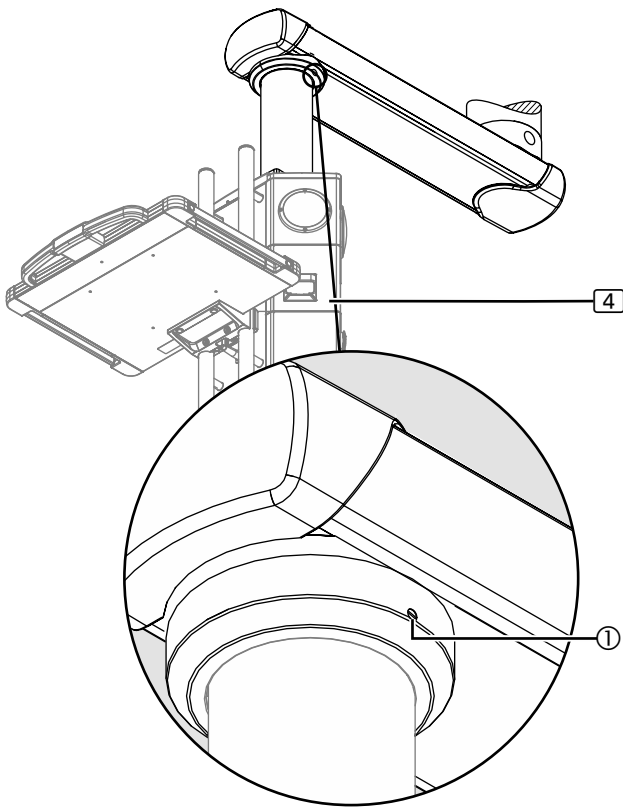
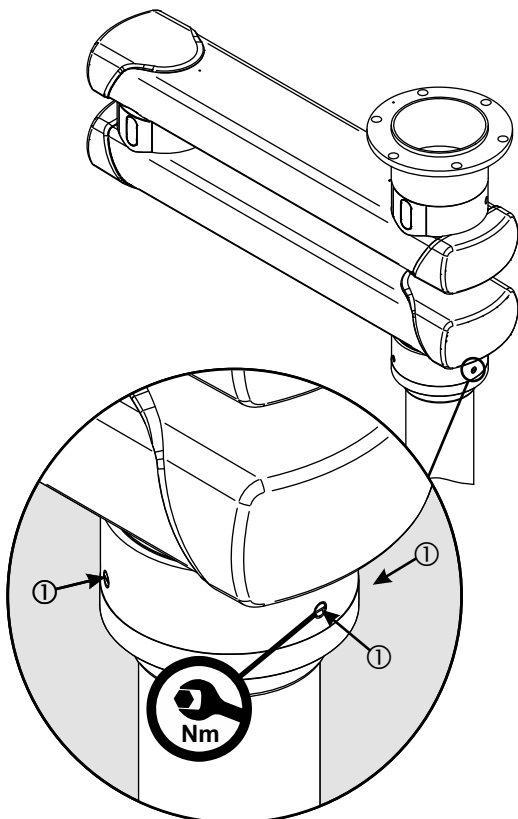


Figure 9: Adjusting the brake on the Drop tube Friction (roller bearing)




7.3 Adjusting the mechanical brake on the Drop tube Friction

7.3.1 Adjusting the brake on the Drop tube Friction (slide bearing)

(See "Figure 8")

The brake screw (friction brake) is adjusted in the same way for all the different pendant system versions.

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 7.1 on Page 25.


Tool to be used

Use a suitable slotted screwdriver.

To increase the brake force

- Insert the slotted screwdriver into the brake screws  and turn it to the right (clockwise).

To reduce the brake force


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

- Perform a function test.

7.3.2 Adjusting the brake on the Drop tube Friction (roller bearing)

(See "Figure 9")

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  (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 7.1 on Page 25.


- Tool to be used

- Use a suitable torque spanner.

- To increase the brake force

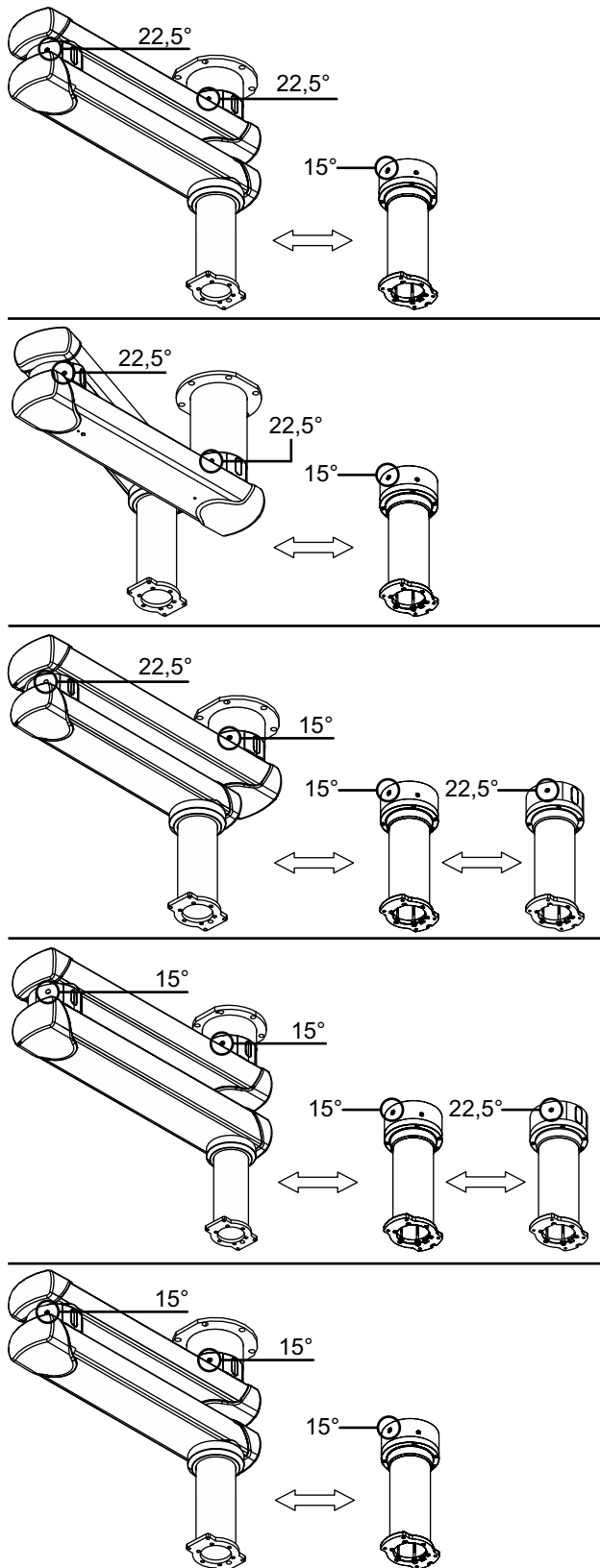
- Screw the slotted brake screws  by uniformly rotating them to the right (clockwise).
- All 3 brake screws must be tightened with the same tightening torque which, however, must not exceed 1.6 Nm.

- To reduce the brake force

- Unscrew the slotted brake screws  by uniformly rotating them to the left (anti-clockwise).

- Perform a function test.

Figure 10: Adjusting the swivel stop on the extension arm and the Drop tube
(from top to bottom: Navigator™, Navigator™ – Inverted, Navigator™ XL, Navigator™ XXL, Navigator™ Air / Navigator™ Air-Plus)



7.4 Adjusting the swivel stop on the extension arm

(See "Figure 10")

The extension arm and the Drop tube are equipped with at least 1 swivel stop which prevents internal cables being destroyed. 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. For the version Navigator™ – Inverted 2 ball stops must always be mounted between the extension arms in order to prevent the extension arms hitting each other.

⚠ WARNING



Electric shock hazard

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

- To restrict the angle of rotation of the extension arm or Drop tube to 340 degrees, mount at least 1 ball stop as described in Chapter 7.4.5 on Page 31.

7.4.1 Versions

(See "Figure 10")

The swivel ranges of the Drop tube and extension arm versions are different:

Navigator™ and Navigator™ – Inverted

Adjust the swivel range of the upper and lower extension arms in graduations of 22.5 degrees. Use 1 setscrew M16 and 2 ball stops Ø 12.7mm for each extension arm.

Navigator™ XL

Adjust the swivel range of the upper extension arm in graduations of 15.0 degrees and the swivel range of the lower extension arm in graduations of 22.5 degrees.

- Use 1 setscrew M20 and 2 ball stops Ø 16mm for the upper extension arm.
- Use 1 setscrew M16 and 2 ball stops Ø 12.7mm for the lower extension arm.

Navigator™ XXL

Adjust the swivel range of the upper and lower extension arms in graduations of 15.0 degrees. Use 1 setscrew M20 and 2 ball stops Ø 16mm for each extension arm.

Navigator™ Air, Navigator™ Air-Plus, Navigator™ Friction

Adjust the swivel range of the upper and lower extension arms in graduations of 15.0 degrees. Use 1 setscrew M16 and 2 ball stops Ø 10mm for each extension arm.

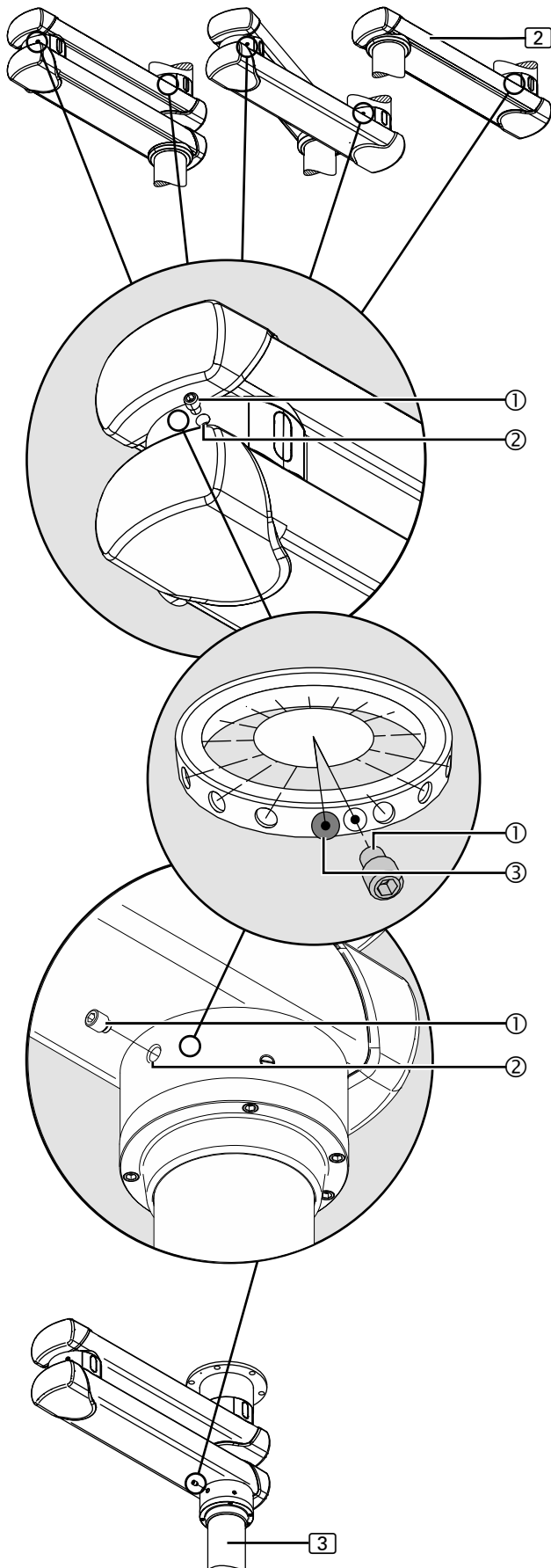
Drop tube with Bearing Unit Friction (roller bearing)

Adjust the swivel range of the Drop tube in graduations of 15.0 degrees. Use 1 setscrew M16 and 2 ball stops Ø 10mm for each Drop tube.

Drop tube with Bearing Unit E-Brake

Adjust the swivel range of the Drop tube in graduations of 22.5 degrees. Use 1 setscrew M16 and 2 ball stops Ø 12.7mm for each Drop tube.

Figure 11: Changing or dismantling the swivel stop



7.4.2 Tool to be used

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

To change a ball stop mounted, refer to Chapter 7.4.3, "Changing or dismantling the swivel stop", on Page 29.

7.4.3 Changing or dismantling the swivel stop

(See "Figure 11")

The following section describes how to adjust the end stop on the Drop tube with Bearing Unit Friction (roller bearing) and on the extension arm. The procedure for adjusting the end stop is identical for the Drop tube with Bearing Unit E-Brake.

1. Follow the general safety instructions prescribed in Chapter 7.1 on Page 25.
2. The assignment and size of the setscrew ① and the ball stop ③ for the different versions of the pendant system and the Drop tube are described in Chapter 7.4.1, "Versions", on Page 28.
3. Unscrew a setscrew ① from the threaded hole ②.
4. Rotate the extension arm or Drop tube until the ball stop ③ in the threaded hole ② is visible.
5. Using a telescopic magnet pick-up tool, remove the ball stop ③ from the threaded hole ② and keep it in a safe place.

⚠ WARNING



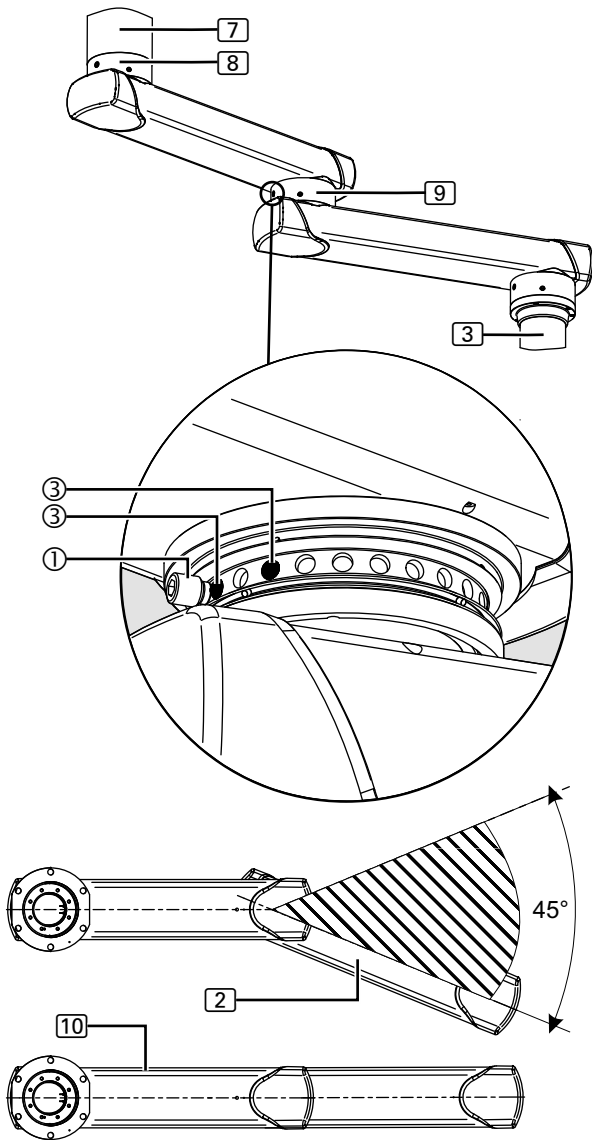
Electric shock hazard

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

- Mount the swivel stop directly afterwards.
- Mount at least 1 ball stop ③ in order to restrict the angle of rotation of the extension arm or Drop tube to 340 degrees.

6. Mount the swivel stop as described in Chapter 7.4.4 on Page 30 and Chapter 7.4.5 on Page 31.

Figure 12: Stop recommendation: Dual-arm pendant system with Bearing Unit Friction (roller bearing)



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

(See "Figure 12")

For all dual-arm pendant systems with a Bearing Unit Friction as intermediate bearing (9), Nuvo recommends that you mount 2 ball stops (3) (position illustrated in the Figure).

The detailed representation illustrates the intermediate bearing (9) (without external bearing ring) and the position of the stop screw (1) to the ball stops (3).

NOTE: Movement range of the lower extension arm

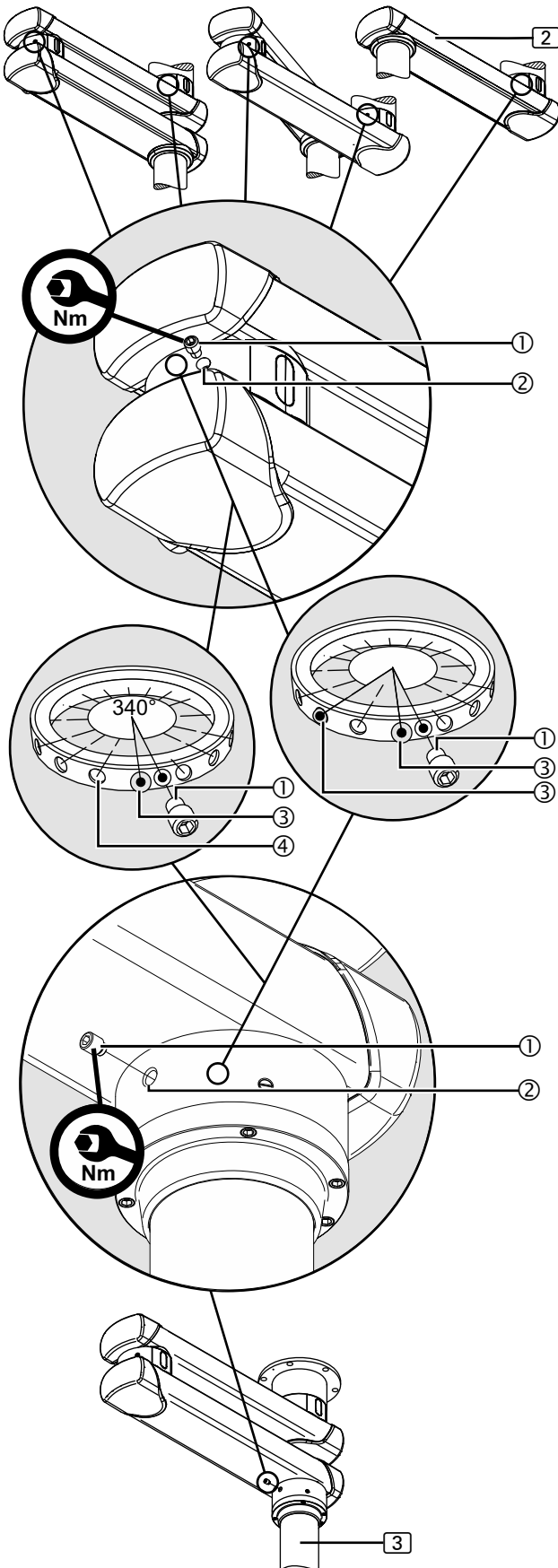
When adjusting the end stop as illustrated in Figure 12, the dead centre area is 45°. This means that the lower extension arm (2) has a maximum movement range of approx. 315°.

If the minimum adjustment on the end stop is not performed whereas the brakes on the intermediate bearing (9) and on the ceiling bearing (8) are adjusted, it is rather difficult to bend the pendant system from the stretched position (10) or rotate it on the intermediate bearing (9) of the lower extension arm (2).

When moving the adaption on the Drop tube (3) from the stretched position (10), there is a risk that the extension arms rotate around the ceiling bearing (8) even though bending in the area of the intermediate bearing (9) would be desired.

For more details on how to mount the swivel stop refer to Chapter 7.4.5 on Page 31.

Figure 13: Mounting the swivel stop



7.4.5 Mounting the swivel stop

(See "Figure 13")

1. Follow the general safety instructions prescribed in Chapter 7.1 on Page 25.
2. The assignment and size of the setscrew ① and the ball stop ③ for the different versions of the pendant system and the Drop tube are described in Chapter 7.4.1, "Versions", on Page 28.
3. Rotate the extension 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 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 or Drop tube using a screwdriver.

⚠ WARNING

Risk of contamination

Version Navigator™ – Inverted: If the 2 ball stops are not mounted between the extension arms, the extension arms can hit each whilst rotating and chips of finish can flake off and can get into open wounds:

- For the Navigator™ – Inverted make sure you always mount 2 ball stops between the extension arms in order to prevent the extension arms hitting each other.

4. Rotate the extension 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 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 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 M16 ① or setscrew M20 ① to 40Nm.

6. Tighten the setscrew ① to 40 Nm.
7. To check that the swivel stop functions securely:
 - The swivel range of the extension arm or Drop tube must be restricted to less than 360 degrees.
 - For the version Navigator™ – Inverted 2 ball stops must always be mounted between the extension arms in order to prevent the extension arms hitting each other.

8.1 General safety instructions

WARNING



Electric shock hazard

The devices can carry an electric current and must be treated with the utmost care during cleaning and disinfection:

- If a mains plug exists, pull out the mains plug.
- Do not apply spray cleaning and/or spray disinfection.
- Do not spray liquid into power sockets, gas sockets or device openings and prevent the penetration of liquids.

8.2 Cleaning

Follow the safety instructions

1. Follow the general safety instructions prescribed in Chapter 8.1, "General safety instructions", on Page 32.

WARNING

Risk of contamination and infection of the patient

Parts of the pendant system and the adaptations are made of plastic. Solvents can dissolve plastic materials. Strong acids, bases and agents with an alcoholic strength of more than 60 % can lead to the plastic materials becoming brittle. Detached particles can fall into open wounds. If liquid cleaning agents are allowed to penetrate the pendant system and the adaptations, excess cleaning liquid may drip into open wounds.

Cleaning agents

Recommended cleaning agents

Use a mild soap solution or a regular dishwashing product.

2. Wipe the surfaces of the devices with a moderately moist cloth; add a mild soap solution (dishwashing product) if required.
3. Afterwards, carefully wipe the surfaces dry with a clean cloth.

8.3 Disinfection

Follow the safety instructions

1. Follow the general safety instructions prescribed in Chapter 8.1, "General safety instructions", on Page 32.

WARNING

The device is not suitable for sterilisation

Avoid damage

- Make sure that no liquid penetrates the device whilst cleaning it.
- To prevent damage to plastic parts, refrain from using abrasives or alkaline, acidic or corrosive cleaning agents.
- Do not use bleaching agents on stainless steel parts.

Deploy trained technical specialists only and abide by national regulations.

- Cleaning/disinfection must be carried out by trained technical specialists only. The requirements of the national hygiene and disinfection committee must be complied with.

CAUTION

Health hazard

Disinfectants can contain substances hazardous to health which, when in contact with the skin and eyes, can cause injuries or affect the respiratory organs when inhaled. Observe the protective measures:

- Observe the hygiene regulations.
- Adhere to the disinfectant manufacturer's instructions.
- Perform surface disinfection every working day and in case of contamination.

Disinfection method

Wiping disinfection is the standardised disinfection method prescribed for the pendant system. Hygiene regulations and related safety instructions for the disinfection methods to be applied must be defined by the operator.

- In case of contamination with potentially infectious material (e.g. blood, body secretion or excrement) the surfaces must be immediately and specifically disinfected.
- Make sure you apply the disinfectant in the correct concentration.
- For surface disinfection do not spray, but wipe, the surfaces.
- Wiped surfaces may only be used after the disinfectant has dried.

9.1 General safety instructions

WARNING



Electric shock hazard

Power supply cables are laid in the pendant system and in the Navigator M6. Contact with energised components presents a danger to life from electric shock. Disconnect the pendant system from the mains before any maintenance work:

- Disconnect all the poles of the pendant system and the Navigator M6 from the mains and prevent them from being reconnected.
- Make sure that all the devices connected via the Navigator M6 are de-energised.
- Wait until the end device (e.g. HF surgical device, flat screen, etc.) has cooled down.

The necessary maintenance work must be carried out as specified in the inspection plan in Chapter 16, "Inspection plan".

9.2 Built-in components from third-party manufacturers

Third-party manufacturers

Built-in components from third-party manufacturers must be inspected and maintained as prescribed in the applicable Operating Instructions.

9.3 Repeated inspection

Repeated inspection must be performed in accordance with DIN EN 62353 standard.

10 Disposal of the Pendant System



10.1 Disposal

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

10.2 List of the materials used for the pendant system

Component	Materials used
Package	Cardboard, paper, wood, metal, plastics
Mechanical load-carrying parts	Metal
Cover panels	Plastics
Cables	Metal, plastics

Figure 14: Navigator™ – Single-arm variant

The Figure shows the pendant system Navigator™ – Single arm. Please note that your pendant system configuration can differ from this illustration.

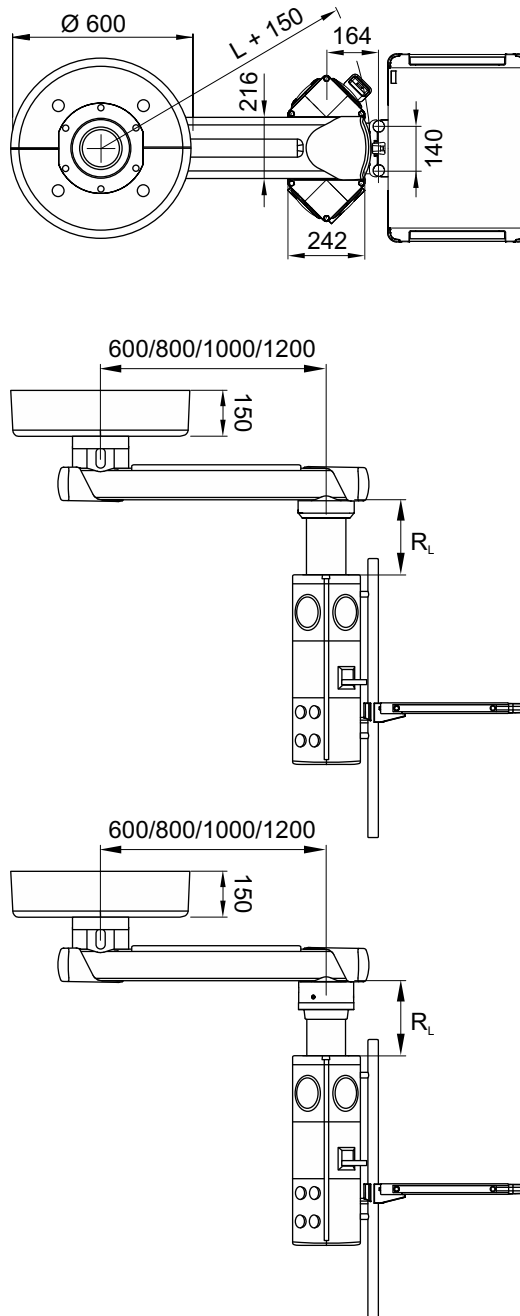


Figure 15: Navigator™ – Dual-arm variant

The Figure shows the pendant system Navigator™ – Dual arm. Please note that your pendant system configuration can differ from this illustration.

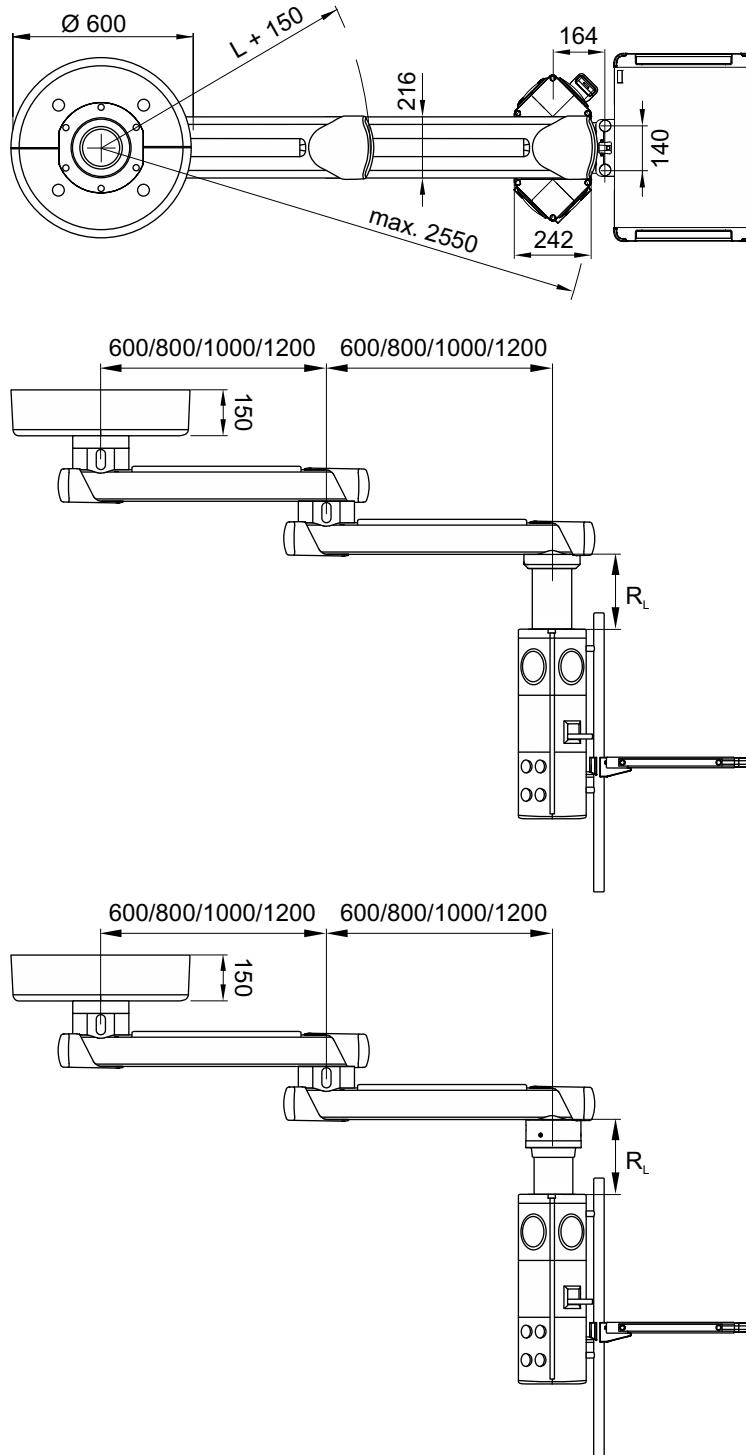


Figure 16: Navigator™ – Inverted – Dual-arm variant

The Figure shows the pendant system Navigator™ – Inverted – Dual arm. Please note that your pendant system configuration can differ from this illustration.

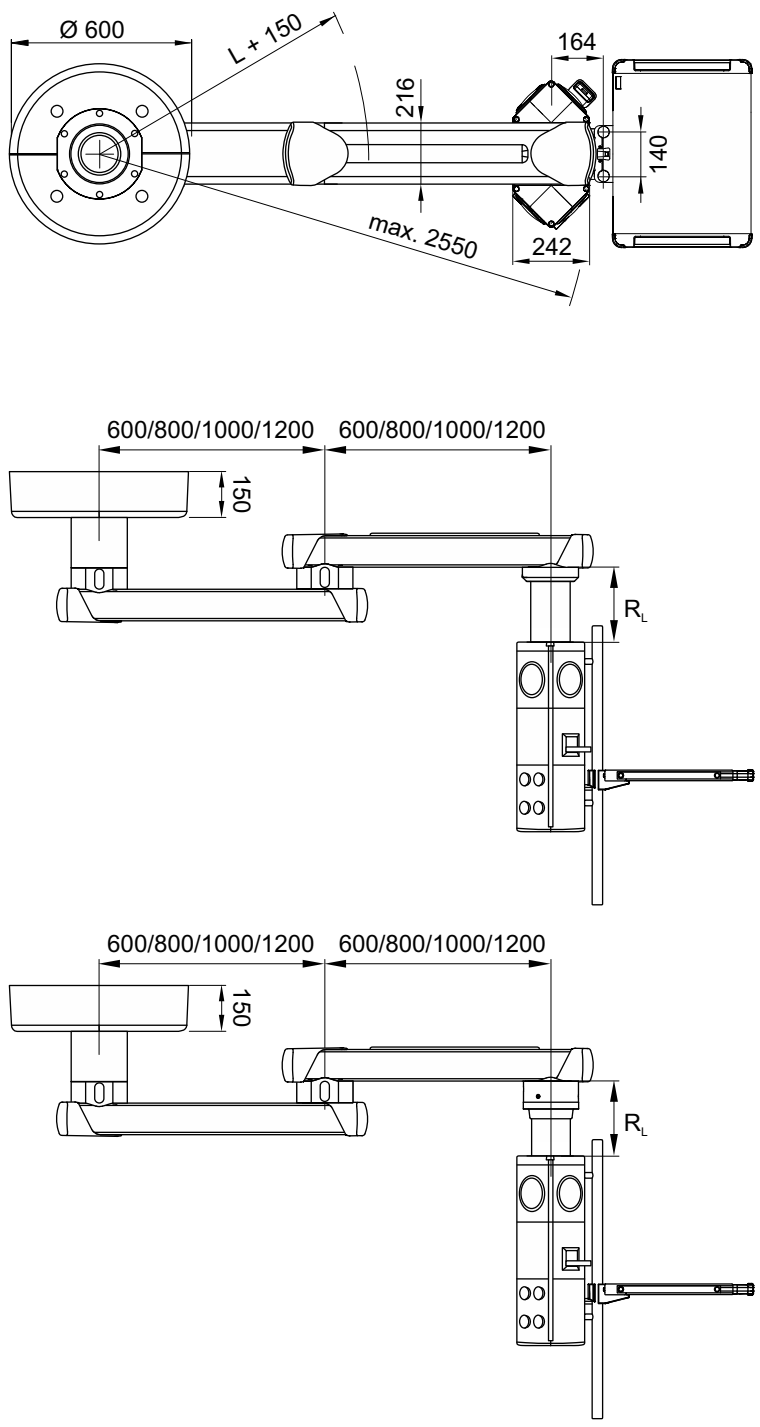


Figure 17: Navigator™ XL – Single-arm variant

The Figure shows the pendant system Navigator™ XL – Single arm. Please note that your pendant system configuration can differ from this illustration.

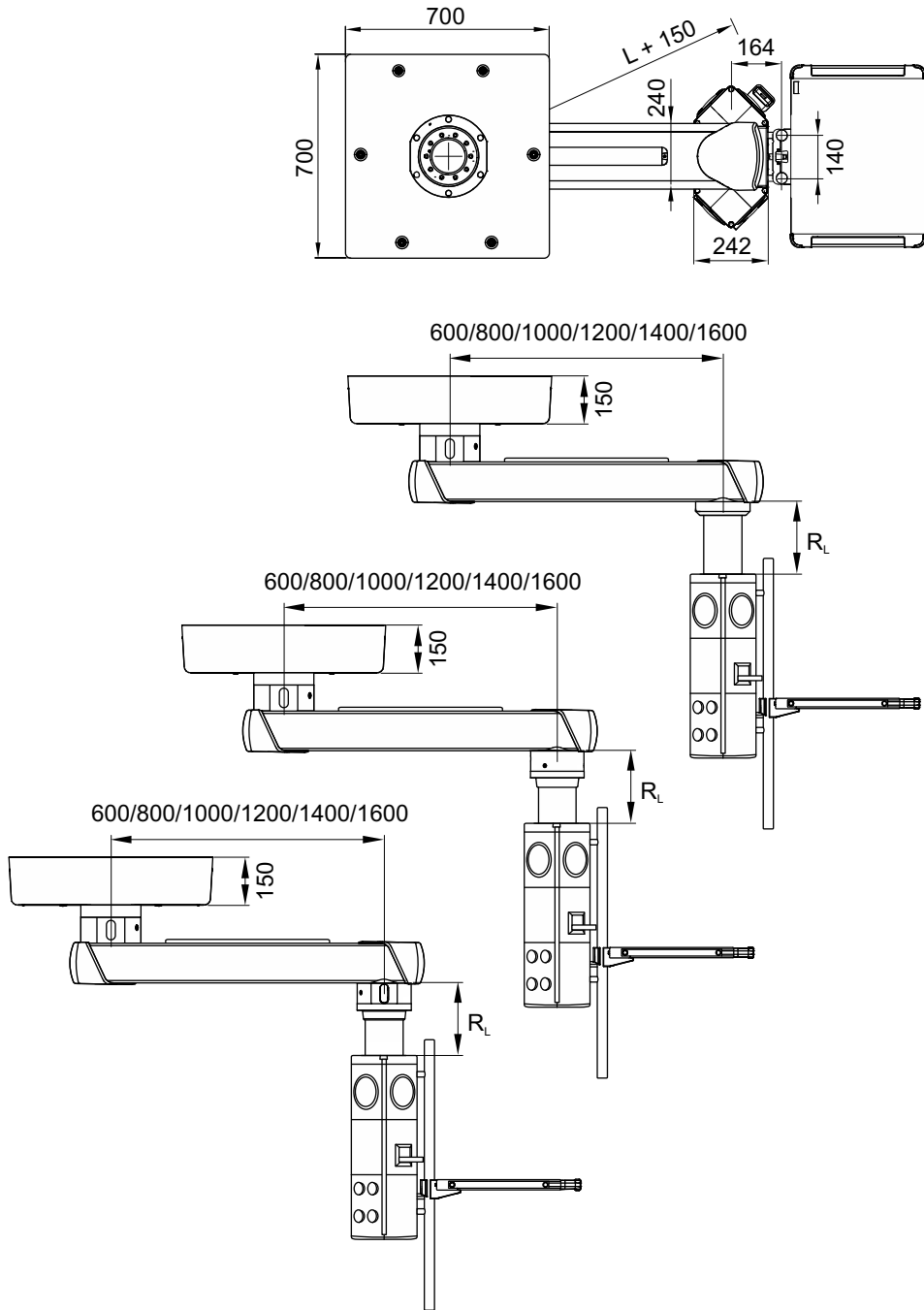


Figure 18: Navigator™ XL – Dual-arm variant

The Figure shows the pendant system Navigator™ XL – Dual arm. Please note that your pendant system configuration can differ from this illustration.

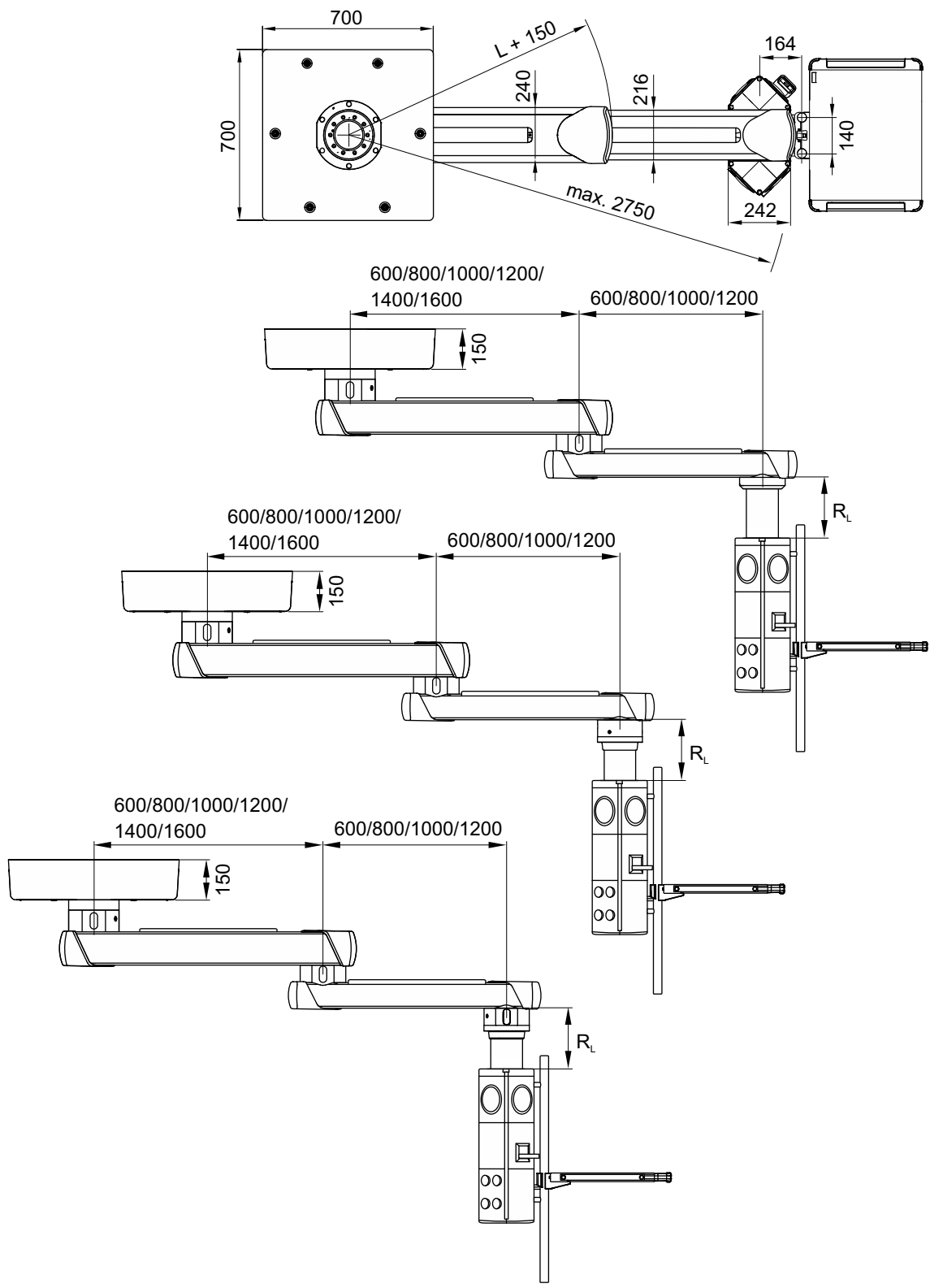


Figure 19: Navigator™ XXL – Dual arm

The Figure shows the pendant system Navigator™ XXL – Dual arm. Please note that your pendant system configuration can differ from this illustration.

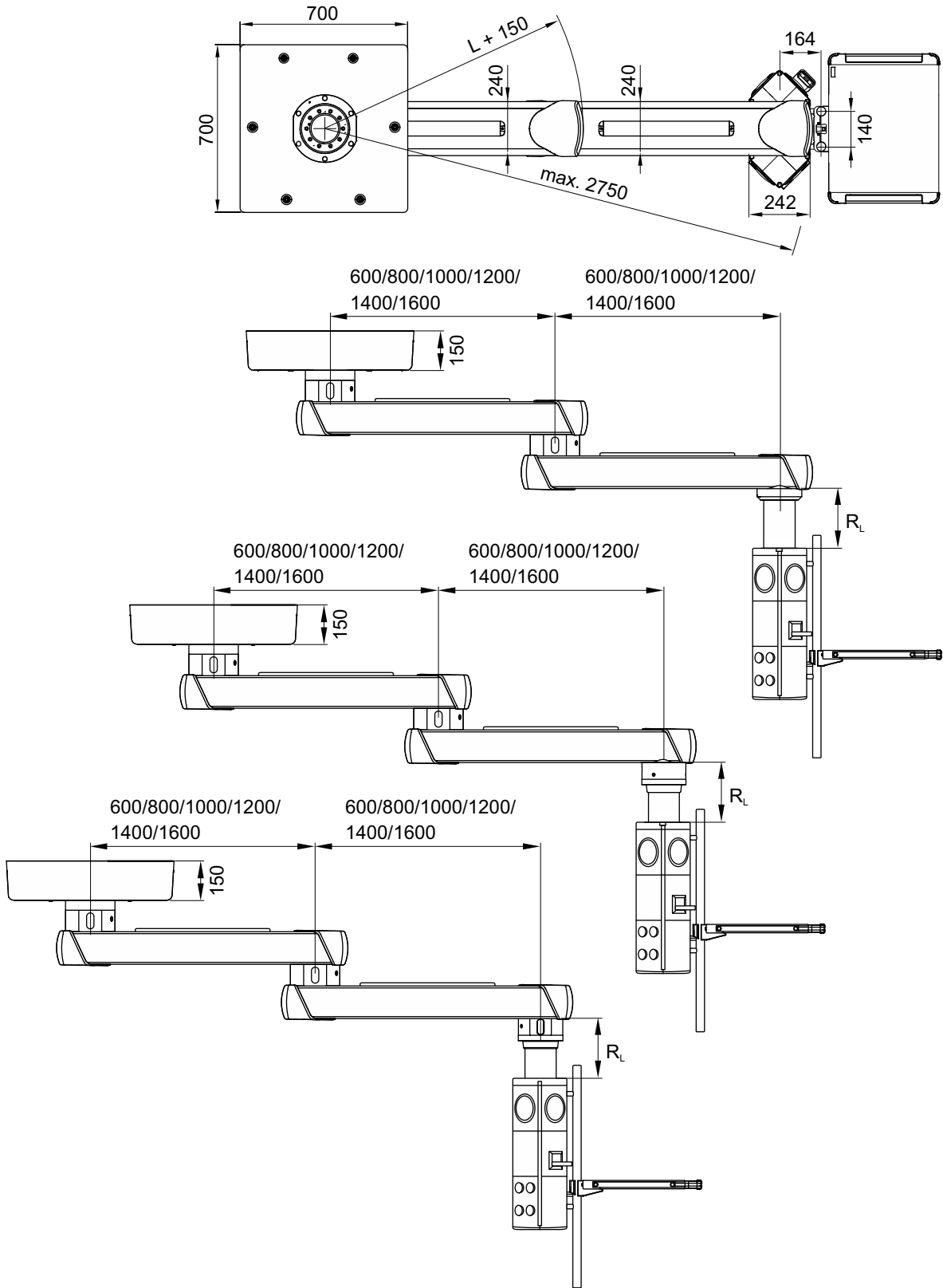


Figure 20: Navigator™ AirPlus / Navigator™ Air / Navigator™ Friction – Single-arm variant

The Figure shows the pendant system Navigator™ AirPlus. Please note that your pendant system configuration can differ from this illustration.

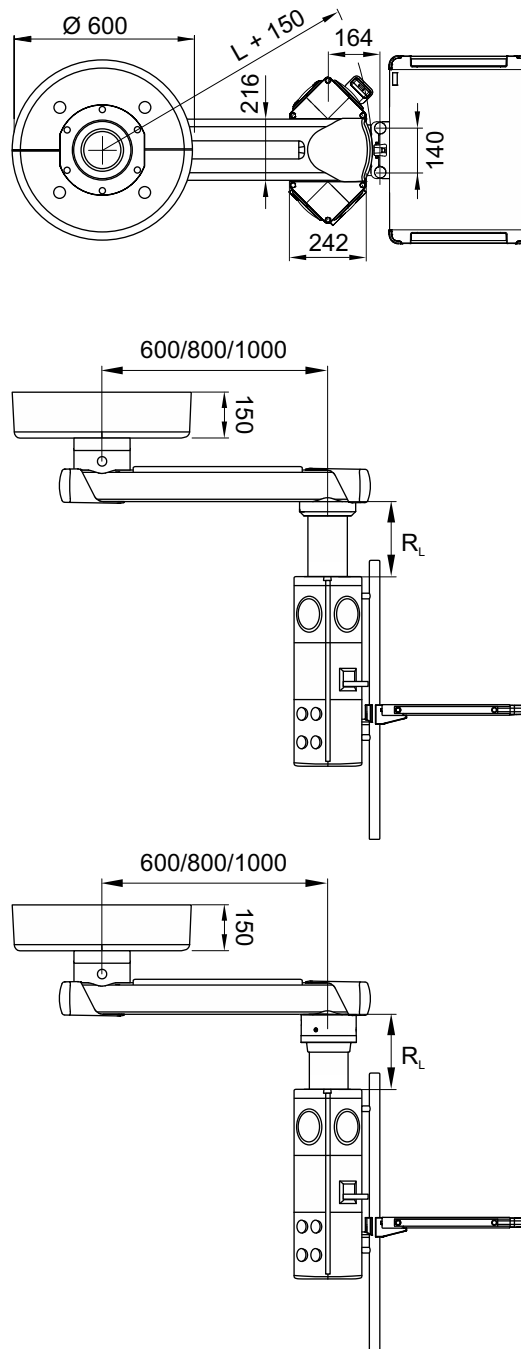
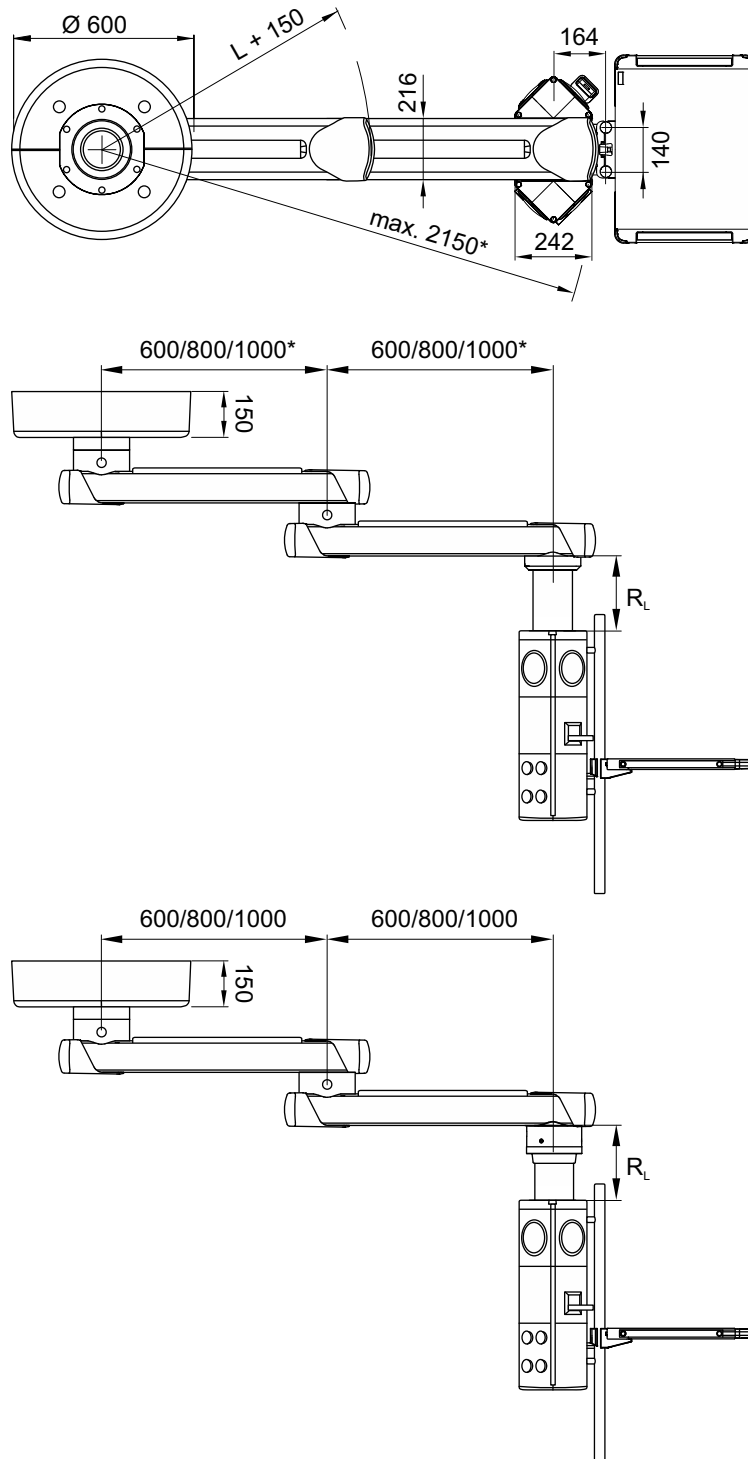


Figure 21: Navigator™ AirPlus / Navigator™ Air / Navigator™ Friction – Dual-arm variant

The Figure shows the pendant system Navigator™ AirPlus. Please note that your pendant system configuration can differ from this illustration. *max. system length: Navigator™ AirPlus 2000 mm or 2150 mm. Navigator™ Air 1800 mm or 1950 mm.



Modes of operation	<ul style="list-style-type: none"> The pendant system is suitable for continuous operation. 																												
Duty cycle of the electromagnetic brakes	<ul style="list-style-type: none"> The maximum duty cycle of the electromagnetic brakes must not exceed 1 minute. If the electromagnetic brakes are actuated over a longer period of time, the power pack can switch off automatically as a protection measure against overheating. Once the power pack has switched off, it must cool down for 10 minutes and then be disconnected from the mains for 10 seconds before being switched back on again. Normal system operation can only be resumed afterwards. 																												
Rating plate	<ul style="list-style-type: none"> The rating plate is attached to the upper extension arm (see Chapter 2.4 on Page 17). 																												
Dead weight of the Navigator™ * pendant system	<p>Single-arm variant</p> <table border="0"> <tr> <td>Extension arm 600mm.....</td> <td>26.0kg</td> </tr> <tr> <td>Extension arm 800mm.....</td> <td>29.0kg</td> </tr> <tr> <td>Extension arm 1000mm.....</td> <td>32.0kg</td> </tr> <tr> <td>Extension arm 1200mm.....</td> <td>35.0kg</td> </tr> </table> <p>Dual-arm variant</p> <table border="0"> <tr> <td>Extension arm 600/600mm.....</td> <td>50.0kg</td> </tr> <tr> <td>Extension arm 600/800mm or 800/600mm</td> <td>53.0kg</td> </tr> <tr> <td>Extension arm 800/800mm.....</td> <td>56.0kg</td> </tr> <tr> <td>Extension arm 1000/600mm or 600/1000mm</td> <td>56.0kg</td> </tr> <tr> <td>Extension arm 1000/800mm or 800/1000mm</td> <td>59.0kg</td> </tr> <tr> <td>Extension arm 1000/1000mm.....</td> <td>62.0kg</td> </tr> <tr> <td>Extension arm 1200/600mm or 600/1200mm</td> <td>59.0kg</td> </tr> <tr> <td>Extension arm 1200/800mm or 800/1200mm</td> <td>62.0kg</td> </tr> <tr> <td>Extension arm 1200/1000mm or 1000/1200mm</td> <td>65.0kg</td> </tr> <tr> <td>Extension arm 1200/1200mm.....</td> <td>68.0kg</td> </tr> </table> <p>* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.</p>	Extension arm 600mm.....	26.0kg	Extension arm 800mm.....	29.0kg	Extension arm 1000mm.....	32.0kg	Extension arm 1200mm.....	35.0kg	Extension arm 600/600mm.....	50.0kg	Extension arm 600/800mm or 800/600mm	53.0kg	Extension arm 800/800mm.....	56.0kg	Extension arm 1000/600mm or 600/1000mm	56.0kg	Extension arm 1000/800mm or 800/1000mm	59.0kg	Extension arm 1000/1000mm.....	62.0kg	Extension arm 1200/600mm or 600/1200mm	59.0kg	Extension arm 1200/800mm or 800/1200mm	62.0kg	Extension arm 1200/1000mm or 1000/1200mm	65.0kg	Extension arm 1200/1200mm.....	68.0kg
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Dead weight of the Navigator™ – Inverted* pendant system	<p>Dual-arm variant</p> <table border="0"> <tr> <td>Extension arm 600/600mm.....</td> <td>50.0kg</td> </tr> <tr> <td>Extension arm 600/800mm or 800/600mm</td> <td>53.0kg</td> </tr> <tr> <td>Extension arm 800/800mm.....</td> <td>56.0kg</td> </tr> <tr> <td>Extension arm 1000/600mm or 600/1000mm</td> <td>56.0kg</td> </tr> <tr> <td>Extension arm 1000/800mm or 800/1000mm</td> <td>59.0kg</td> </tr> <tr> <td>Extension arm 1000/1000mm.....</td> <td>62.0kg</td> </tr> <tr> <td>Extension arm 1200/600mm or 600/1200mm</td> <td>59.0kg</td> </tr> <tr> <td>Extension arm 1200/800mm or 800/1200mm</td> <td>62.0kg</td> </tr> <tr> <td>Extension arm 1200/1000mm or 1000/1200mm</td> <td>65.0kg</td> </tr> <tr> <td>Extension arm 1200/1200mm.....</td> <td>68.0kg</td> </tr> </table> <p>* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.</p>	Extension arm 600/600mm.....	50.0kg	Extension arm 600/800mm or 800/600mm	53.0kg	Extension arm 800/800mm.....	56.0kg	Extension arm 1000/600mm or 600/1000mm	56.0kg	Extension arm 1000/800mm or 800/1000mm	59.0kg	Extension arm 1000/1000mm.....	62.0kg	Extension arm 1200/600mm or 600/1200mm	59.0kg	Extension arm 1200/800mm or 800/1200mm	62.0kg	Extension arm 1200/1000mm or 1000/1200mm	65.0kg	Extension arm 1200/1200mm.....	68.0kg								
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Extension arm 1200/1200mm.....	68.0kg																												

Dead weight of the
Navigator™ XL* pendant system

Single-arm variant	
Extension arm 600 mm	40.1 kg
Extension arm 800 mm	45.1 kg
Extension arm 1000 mm	50.1 kg
Extension arm 1200 mm	55.1 kg
Extension arm 1400 mm	60.1 kg
Extension arm 1600 mm	65.1 kg

Dual-arm variant	
Extension arm 600/600 mm	64.4 kg
Extension arm 600/800 mm	67.4 kg
Extension arm 600/1000 mm	70.5 kg
Extension arm 600/1200 mm	73.5 kg
Extension arm 800/600 mm	69.4 kg
Extension arm 800/800 mm	72.4 kg
Extension arm 800/1000 mm	75.5 kg
Extension arm 800/1200 mm	78.5 kg
Extension arm 1000/600 mm	74.4 kg
Extension arm 1000/800 mm	77.4 kg
Extension arm 1000/1000 mm	80.5 kg
Extension arm 1000/1200 mm	83.5 kg
Extension arm 1200/600 mm	79.4 kg
Extension arm 1200/800 mm	82.4 kg
Extension arm 1200/1000 mm	85.5 kg
Extension arm 1200/1200 mm	88.5 kg
Extension arm 1400/600 mm	84.4 kg
Extension arm 1400/800 mm	87.4 kg
Extension arm 1400/1000 mm	90.5 kg
Extension arm 1400/1200 mm	93.5 kg
Extension arm 1600/600 mm	89.4 kg
Extension arm 1600/800 mm	92.4 kg
Extension arm 1600/1000 mm	95.5 kg

* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.

Dead weight of the
Navigator™ XXL* pendant system

Dual-arm variant	
Extension arm 600/600 mm	80.2 kg
Extension arm 600/800 mm or 800/600 mm	85.2 kg
Extension arm 600/1000 mm or 1000/600 mm	90.2 kg
Extension arm 600/1200 mm or 1200/600 mm	95.2 kg
Extension arm 1400/600 mm	100.2 kg
Extension arm 1600/600 mm	105.2 kg
Extension arm 800/800 mm	90.2 kg
Extension arm 800/1000 mm or 1000/800 mm	95.2 kg
Extension arm 800/1200 mm or 1200/800 mm	100.2 kg
Extension arm 800/1400 mm or 1400/800 mm	105.2 kg
Extension arm 1600/800 mm	110.2 kg
Extension arm 1000/1000 mm	100.2 kg
Extension arm 1000/1200 mm or 1200/1000 mm	105.2 kg
Extension arm 1000/1400 mm or 1400/1000 mm	110.2 kg
Extension arm 1000/1600 mm or 1600/1000 mm	115.2 kg
Extension arm 1200/1200 mm	110.2 kg
Extension arm 1200/1400 mm or 1400/1200 mm	115.2 kg

* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.

Dead weight of the Navigator™ Air*, Navigator™ AirPlus* and Navigator™ Friction* pendant systems	Single-arm variant	
	Extension arm 600mm.....	26.0kg
	Extension arm 800mm.....	29.0kg
	Extension arm 1000mm.....	32.0kg
	Dual-arm variant	
	Extension arm 600/600mm.....	50.0kg
	Extension arm 600/800mm or 800/600mm	53.0kg
	Extension arm 800/800mm.....	56.0kg
	Extension arm 1000/600mm or 600/1000mm	56.0kg
	Extension arm 1000/800mm or 800/1000mm	59.0kg
	Extension arm 1000/1000mm (AirPlus only)	62.0kg
	* Without gas hoses and supply cables inserted, without ceiling or Drop tube and without optional accessories.	
Dead weight of the ceiling tube Navigator™ pendant system	Flange	6.0kg
	Steel tube	24kg/m
Dead weight of the ceiling tube of the Navigator™ XL and Navigator™ XXL pendant systems	Flange	7.5kg
	Steel tube	31.7kg/m
Dead weights of the bearing units on the Drop tube	Bearing Unit Friction (slide bearing).....	5kg
	Bearing Unit Friction (roller bearing).....	13kg
	Bearing Unit E-Brake	14kg
Dead weight of the Drop tube	Drop tube	8kg/m
Maximum load bearing capacity of the Navigator™ pendant system	Single-arm variant	
	Extension arm 600mm.....	640kg
	Extension arm 800mm.....	470kg
	Extension arm 1000mm.....	370kg
	Extension arm 1200mm.....	300kg
	Dual-arm variant	
	Extension arm 600/600mm.....	300kg
	Extension arm 600/800mm or 800/600mm	260kg
	Extension arm 800/800mm.....	220kg
	Extension arm 1000/600mm or 600/1000mm	220kg
	Extension arm 1000/800mm or 800/1000mm	190kg
	Extension arm 1000/1000mm.....	170kg
	Extension arm 1200/600mm or 600/1200mm	190kg
	Extension arm 1200/800mm or 800/1200mm	170kg
	Extension arm 1200/1000mm or 1000/1200mm	150kg
Extension arm 1200/1200mm.....	130kg	
Maximum load bearing capacity of the Navigator™ – Inverted pendant system	Dual-arm variant	
	Extension arm 600/600mm.....	300kg
	Extension arm 600/800mm or 800/600mm	260kg
	Extension arm 800/800mm.....	220kg
	Extension arm 1000/600mm or 600/1000mm	220kg
	Extension arm 1000/800mm or 800/1000mm	190kg
	Extension arm 1000/1000mm.....	170kg
	Extension arm 1200/600mm or 600/1200mm	190kg
	Extension arm 1200/800mm or 800/1200mm	170kg
	Extension arm 1200/1000mm or 1000/1200mm	150kg
	Extension arm 1200/1200mm.....	130kg

Maximum load bearing capacity of the
Navigator™ XL pendant system

Single-arm variant

Extension arm 600mm	1,000kg
Extension arm 800mm	820kg
Extension arm 1000mm	650kg
Extension arm 1200mm	540kg
Extension arm 1400mm	480kg
Extension arm 1600mm	400kg

Dual-arm variant

Extension arm 600/600mm	530kg
Extension arm 600/800mm	470kg
Extension arm 800/600mm	470kg
Extension arm 800/800mm	390kg
Extension arm 600/1000mm	370kg
Extension arm 800/1000mm	330kg
Extension arm 1000/600mm	390kg
Extension arm 600/1200mm	300kg
Extension arm 1000/800mm	330kg
Extension arm 1200/600mm	330kg
Extension arm 800/1200mm	300kg
Extension arm 1000/1000mm	300kg
Extension arm 1000/1200mm	270kg
Extension arm 1200/800mm	300kg
Extension arm 1200/1000mm	270kg
Extension arm 1200/1200mm	240kg
Extension arm 1400/600mm	300kg
Extension arm 1400/800mm	270kg
Extension arm 1400/1000mm	240kg
Extension arm 1400/1200mm	200kg
Extension arm 1600/600mm	270kg
Extension arm 1600/800mm	240kg
Extension arm 1600/1000mm	200kg

Maximum load bearing capacity of the
Navigator™ XXL pendant system

Dual-arm variant

Extension arm 600/600mm	540kg
Extension arm 600/800mm	480kg
Extension arm 800/600mm	480kg
Extension arm 800/800mm	400kg
Extension arm 600/1000mm	400kg
Extension arm 800/1000mm	340kg
Extension arm 1000/600mm	400kg
Extension arm 600/1200mm	340kg
Extension arm 1000/800mm	340kg
Extension arm 1200/600mm	340kg
Extension arm 800/1200mm	310kg
Extension arm 800/1400mm	280kg
Extension arm 1000/1000mm	310kg
Extension arm 1000/1200mm	280kg
Extension arm 1000/1400mm	250kg
Extension arm 1000/1600mm	210kg
Extension arm 1200/800mm	310kg
Extension arm 1200/1000mm	280kg
Extension arm 1200/1200mm	250kg
Extension arm 1200/1400mm	210kg
Extension arm 1400/600mm	310kg
Extension arm 1400/800mm	280kg
Extension arm 1400/1000mm	250kg
Extension arm 1400/1200mm	210kg

	Extension arm 1600/600mm.....	280kg
	Extension arm 1600/800mm.....	250kg
	Extension arm 1600/1000mm.....	210kg
Maximum load bearing capacity of the Navigator™ Air pendant system	Single-arm variant	
	Extension arm 600mm.....	580kg
	Extension arm 800mm.....	420kg
	Extension arm 1000mm.....	320kg
	Dual-arm variant	
	Extension arm 600/600mm.....	260kg
	Extension arm 600/800mm.....	220kg
	Extension arm 800/600mm.....	220kg
	Extension arm 800/800mm.....	180kg
	Extension arm 600/1000mm.....	180kg
	Extension arm 800/1000mm.....	150kg
	Extension arm 1000/600mm.....	180kg
Extension arm 1000/800mm.....	150kg	
Maximum load bearing capacity of the Navigator™ AirPlus and Navigator™ Friction pendant system	Single-arm variant	
	Extension arm 600mm.....	640kg
	Extension arm 800mm.....	470kg
	Extension arm 1000mm.....	370kg
	Dual-arm variant	
	Extension arm 600/600mm.....	300kg
	Extension arm 600/800mm.....	260kg
	Extension arm 800/600mm.....	260kg
	Extension arm 800/800mm.....	220kg
	Extension arm 600/1000mm.....	220kg
	Extension arm 800/1000mm.....	190kg
	Extension arm 1000/600mm.....	220kg
Extension arm 1000/800mm.....	190kg	
Extension arm 1000/1000mm.....	170kg	
Electrical data	Rated voltage.....	AC 100-240V
	Rated frequency	60 / 50Hz
	Rated frequency	up to 220W
	Indirect extension arm lighting	DC 12V
	2 / 4 lighting boards (supply voltage 12V DC, 2 lighting boards each connected in series to 24V DC)	
Noise level	Sound energy level	65db(A) (EN ISO 3746) not exceeded
Brake torque	Brake torque with the brake actuated	
	Navigator™ Air	approx. 50Nm
	Navigator™ AirPlus.....	approx. 50Nm
	Navigator™	approx. 70Nm
	Navigator™ – Inverted	approx. 70Nm
	Navigator™ XL	approx. 150Nm / 70Nm
	Navigator™ XXL	approx. 150Nm

Manual forces	Dynamic torque with the brake released Depending on the position and payload3.5 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"> • Medical Devices Act (MPG) • 93/42 EEC (Medical Device Directive) • IEC 60601-1 – Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance
Approvals of the standard equipment	<ul style="list-style-type: none"> • Recognised NRTL component.
Approved adaptations	<p>The following Nuvo products are approved as adaptations to the pendant system:</p> <ul style="list-style-type: none"> • Chapter 14, “Approved Nuvo Products”, on Page 54, • Chapter 15, “Optional Accessories”, on Page 54: – The components are adapted to each other and safe to operate. Any other type of installation, and in particular the use of components from third-party manufacturers, is strictly prohibited because these components can be potential sources of danger. – 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.
Read the Operating Instructions for combined medical products	<ul style="list-style-type: none"> • The pendant system can be equipped with adaptations and end devices of third-party manufacturers. To prevent dangerous overload, which can damage or lead to a collapse of the pendant system, the maximum load bearing capacity specified in Chapter 12, “Technical Data”, on Page 43 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. – Read the Operating Instructions provided by the third-party manufacturer to obtain the information required for the operation of the end device.

13.1 Guidelines and manufacturer's declarations

13.1.1 Electromagnetic emissions

The Navigator™ is intended for use in the ELECTROMAGNETIC ENVIRONMENT specified below. The customer or the user of the Navigator™ 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™ 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™ 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	

13.1.2 Electromagnetic immunity

The Navigator™ is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator™ 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™ is intended for use in the ELECTROMAGNETIC environment specified below. The customer or the user of the Navigator™ 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>^a 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™ is used exceeds the applicable RF compliance level above, the Navigator™ 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™.</p> <p>^b Field strengths over the 150 kHz to 80 MHz frequency range should be less than 3 V/m.</p>		

13.1.3 Test specifications

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

Test frequency MHz	Frequency band ^a MHz	Radio service ^a	Modulation ^b	Maximum power W	Distance m	IMMUNITY TEST LEVEL V/m
385	380 to 390	TETRA 400	Pulse modulation ^b 18Hz	1.8	0.3	27
450	430 to 470	GMRS 460, FRS 460	FM ^c ± 5kHz stroke 1kHz sine	2	0.3	28
710	704 to 787	LTE Band 13, 17	Pulse modulation ^b 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 ^b 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 ^b 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 ^b 217Hz	2	0.3	28
5240	5100 to 5800	WLAN 802.11 a/n	Pulse modulation ^b 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.

^a 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.

^b The carrier must be modulated with a square wave signal with a 50% duty cycle.

^c 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™ components and cables specified by the MANUFACTURER. Be aware that the performance of the device can be reduced if this safety rule is not observed.

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

15 Optional Accessories

Designation	Dead weight	Maximum payload
Indirect extension arm lighting	2.0 kg	---
Brake indicator lighting board	0.1 kg	---
Adapter Acrobat Swing 3p, L150*	1,6kg	10kg / 113Nm
Adapter Acrobat 2000 3p, L150*	2,9kg	30kg / 390Nm
Adapter Acrobat 2000 with stop, L150*	2,8kg	30kg / 390Nm

* 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™ / Navigator™ Air / Navigator™ Air*Plus* in lengths of 800mm and 1000mm

Navigator™ XL in lengths of 1000mm and 1200mm

The Navigator™ XXL cannot be ordered with preparation.





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