

tediselmedical

ABITUS

INSTALLATION MANUAL



CE 0197

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1. Manufacturer

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2. Security information

Important notes in these operating instructions are marked with graphic symbols and signal words.

2.1. Injury risk warnings

Signal words such as DANGER, WARNING or CAUTION describe the degree of risk of injury. The different triangular symbols visually emphasise the degree of danger.



WARNING

Refers to a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Refers to a potential hazard which, if not avoided, may result in minor or slight injury.



DANGER

Refers to an immediate danger which, if not avoided, will result in death or serious injury.



Risk of finger entrapment

2.2. Warnings of risk of damage

The signal word WARNING describes the degree of risk of material damage. The triangular symbol visually emphasises the degree of danger.



Damage to surfaces: warns of damage to surfaces due to unsuitable cleaning agents and disinfectants.



NOTICE

Refers to a potential hazard which, if not avoided, may cause damage to the equipment.

2.3. Additional symbols used in the safety instructions



Fire hazard



Explosion hazard: warns of ignition of explosive gas mixtures.



Dangerous voltage: warns of electric shock that can cause serious injury or death.



Failure of the roof support system



Risk of collision

2.4. Indication of additional information

NOTA

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

2.5. Proper use of oxygen.

2.5.1. Oxygen explosion



Oxygen becomes explosive when it comes into contact with oils, greases and lubricants.

Compressed oxygen presents an explosion hazard:

- Make sure that oxygen and gas outlets are free of oil, greasy materials and lubricants!
- Do not use cleaning agents containing oil, grease or lubricants.

2.5.2. fire hazard



DANGER: Escaping oxygen is combustible:

- Open fire, red-hot objects and open light are not allowed when working.

with oxygen!

- Don't smoke!

2.6. Patient environment

The dimensions in the figure below illustrate the minimum extent of the patient environment in an unrestricted area according to IEC 60601-1.

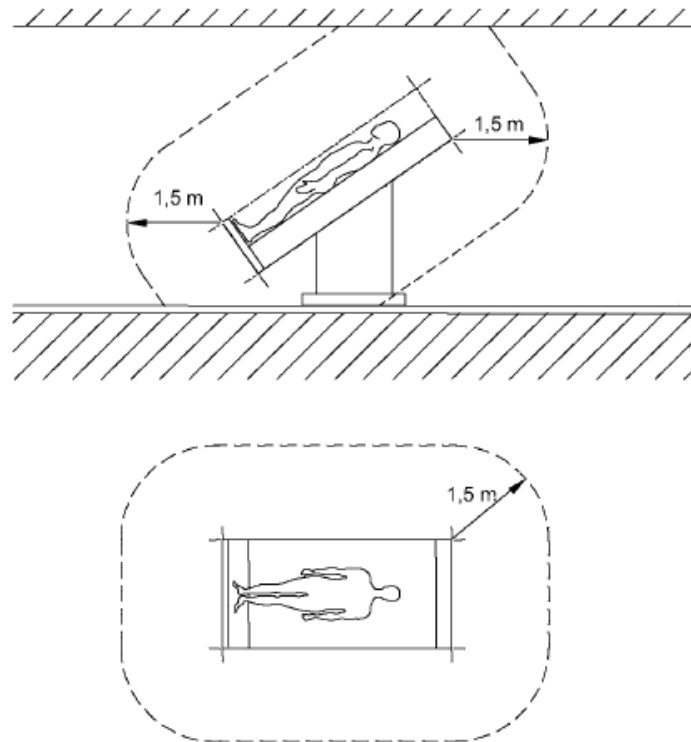


Fig. 1 Minimum extent of the PATIENT ENVIRONMENT

2.7. Combination with products from other manufacturers.

The suspension system is combined with the service head. To avoid dangerous overloads, which can damage or cause collapse of the service head and the pendant system, the specified maximum load capacity must be observed.



See point 6.7 of the user and cleaning manual supplied with the equipment.

Power supply packages intended to supply power to end devices must ensure electrical isolation and provide two protective measures according to IEC 60601-1.

NOTA

The party putting the device into operation is responsible for the validation of the whole system. If necessary, a conformity assessment procedure shall be performed and a

declaration of conformity with Article 22 of the Medical Devices Regulation (EU) 2017/745 shall be provided.



Read the Operating Instructions provided by the external manufacturer to obtain the necessary information for the operation of the end device.

3. Risks

3.1. Gas explosion



Oxygen becomes explosive when it comes into contact with oils, greases and lubricants.

When in contact with oxygen in the air, medical gases may form an explosive or easily flammable gas mixture. The equipment is not suitable for use in environments containing flammable mixtures of anaesthetics with high concentrations of oxygen or nitrous oxide.

If such high concentrations of flammable mixtures of anaesthetics with oxygen or nitrous oxide occur in the environment of the device, there is a risk of ignition under certain conditions.

3.2. Risk of device malfunction



CAUTION: If a device is connected to the equipment and trips the protection mechanism of the corresponding circuit in the health care facility, other devices connected to the equipment will not receive power.

3.3. Risk of patient contamination and infection



WARNING: Parts of the pendant system and adaptations are made of plastic. Solvents can dissolve plastic materials. Strong acids, bases and agents with an alcohol content of more than 60 % can cause plastic materials to become brittle. Dislodged particles may fall into open wounds. If liquid cleaning agents are allowed to penetrate the suspension system and fittings, excess cleaning fluid may drip into open wounds.

3.4. Fire risk



Plug-in connections for the supply of medical gases must not come into contact with oil, grease or flammable liquids.

3.5. Danger of electric shock



Signal cables (network, audio, video, etc.) must be electrically isolated from equipment and the ends of building connections to prevent contact with currents that can cause serious injury or death.

3.6. Risk of collision



In the event of a collision with other devices, walls or ceilings, the pendant system and service head may be damaged and important patient care systems may fail, after a collision, the service head and pendant system should be inspected for damage.

3.7. Risk of system crash due to overload



The dead weights of all attached components and the weight of the attached loads must not exceed the maximum load weight of the base support unit.



If the maximum load capacity has been exceeded, there is a risk that the suspension system or components of the suspension system may become detached from the securing device and fall.

- The maximum load capacity of the suspension system and its components must not be exceeded!



See point 6 of the user and cleaning manual supplied with the equipment.

- Do not attach or mount any additional loads on the extension arms, service head and end devices.

3.8. Risk of system crash due to poor installation



















If the fasteners of the individual parts of the system are not correctly positioned or if the tightening torques of the fasteners are not observed, the suspension system may come loose from its fastenings and fall down.

4. Symbols used



Applicable part B

	Earth (mass)
	Equipotentiality
	Protective earth (ground)
N	Connection point for neutral conductor
	Nurse call button
	Direct lighting
	Indirect lighting
	Operating instructions
	Health Product
	Waste electrical equipment
	CE symbol
	Product code

		Unique identification code
		Serial number
		Manufacturer
		Date of manufacture
		Reference to the instruction manual
		Damage to surfaces
		Fire hazard
		Danger of explosion
		Dangerous tension
	NOTICE	Notice
		Risk of finger entrapment

	WARNING	Warning
	CAUTION	Caution
	DANGER	Danger

5. Installation requirements

5.1. Equipment required for installation

- Lifting device or forklift with a permissible payload of at least 250 kg. Alternatively, a lifting winch with a permissible payload of at least 250 kg can be used if space is limited:



CAUTION

Check that the suspension system is sufficiently secured before lifting.



WARNING

During the lifting movement, be sure to avoid collisions with other suspension systems, devices, ceilings or walls and other assemblies.

- Protective gloves
- Digital spirit level
- Torque spanner
- Multimeter
- Standard tool kit
- Spanner 36
- 1 set of telescopic magnet pick-up tools
- Working platform (e.g. pedestal ladder) in accordance with country-specific occupational safety and health standards

5.2. Training

The personnel performing the installation must be properly trained and qualified by the customer. The equipment must only be INSTALLED by authorised personnel. Persons who:

1. have received the training and are duly registered (at those levels where legal provisions make such registration necessary).
2. have been instructed in the installation of this device by means of this instruction manual as a basis.
3. are able to assess the tasks they perform on the basis of their own professional experience and training in relevant safety standards and can recognise the potential hazards involved in the work.

6. Installation and connection

6.1. Installation recommendations

The figure shows a configuration of the equipment. The most common measuring ranges for each of the dimensions specified in the figure are given below.

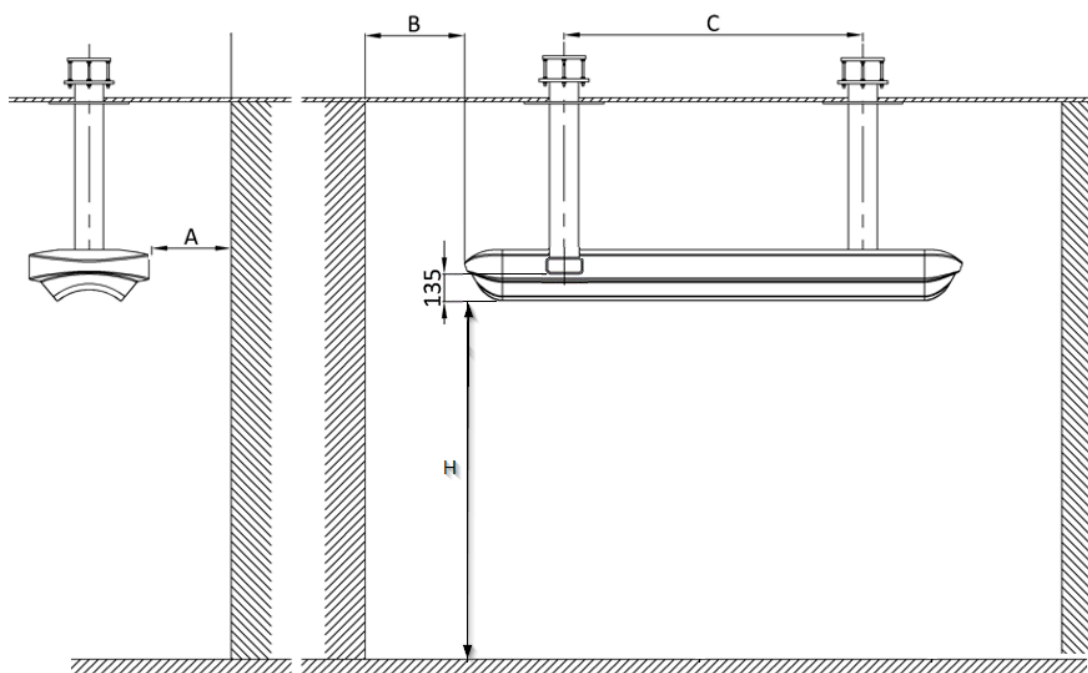


Fig. 2 Recommendations for installation

Measure	Description	
A	Wall clearance parallel to the main body of the equipment (mm)	Min 500

B	Wall clearance perpendicular to the main body of the equipment (mm)	Min 300
C	Distance between supports to ceiling per bed (mm)	Max 1500
H	Ground clearance (depending on the project)	Recommended 1900

The location of the headrest inside the box depends on the requirements of the project, and this section only shows the recommendations of minimum distances to be respected to ensure proper ergonomics and maintenance.

- Check that the position of the ABITUS anchor point does not impede any other installation or component between the suspended ceiling and the floor.

The anchor bolt must be fixed to the floor slab as previously defined in the project drawings.



See the installation drawings supplied with the equipment.

6.2. Installation references

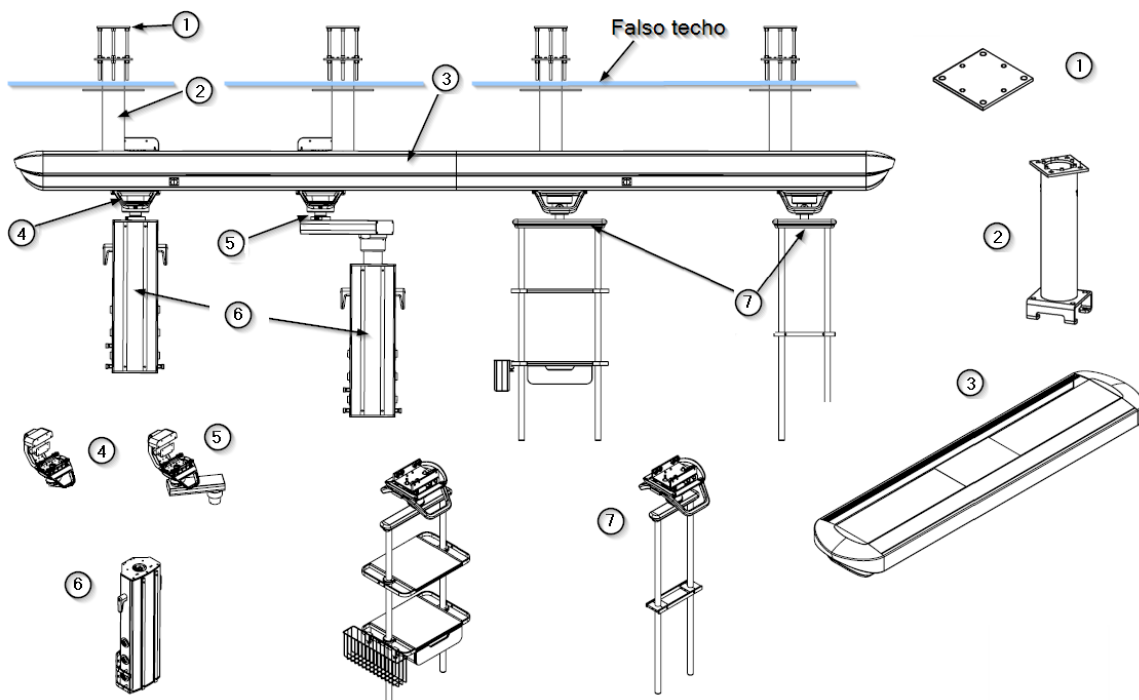







Fig. 3 Installation references

1	Interface plate - pre-assembled (one per downpipe)
2	Downpipe (Including trim) - (two per main body section)
See point 6.5 of this manual	

	<p>Material included: 4 rod M16 8.8 (length 350mm)</p> <p>12 nut DIN934 for M16</p> <p>12 washer DIN125 for M16</p> <p>12 washer Grower DIN127 for M16</p>
3	<p>Main body (suspended head section)</p> <p> See section 6.7 of this manual</p> <p>Material included:</p> <ul style="list-style-type: none"> - Main body chassis (as many as sections) - Side walls (pre-assembled) quantity depending on the project. - 8 rod M8 8.8 (length 80mm) - 8 spring washer NFE 25511 for M8 (8.2 x 18 x 1.4) - 8 nut DIN934 for M8 - 8 spacer sleeves for downpipe anchorage - 4 plates for downpipe anchorage
4	<p>Carousel (assembled) - variant without extension arm (one per column)</p> <p> See manufacturing drawing accompanying the equipment</p> <p>Material included:</p> <ul style="list-style-type: none"> - 1 carousel with friction brake and pneumatic brake. - Including trims - 2 limit switches (pre-mounted on the main body)
5	<p>Carousel (mounted) - variant with extension arm (one per column)</p> <p> See manufacturing drawing accompanying the equipment</p> <p>Material included:</p> <ul style="list-style-type: none"> - 1 Carousel with extension arm, friction brake and pneumatic brake. - Including trims - 2 limit switches (pre-mounted on the main body)
6	<p>Service head or column (mounted) - depending on version</p> <p> See manufacturing drawing accompanying the equipment</p> <p>Material included:</p> <ul style="list-style-type: none"> - 1 service head or column (on request) - Including trims - Accessories not included
7	<p>Trolley - depending on version (not including accessories)</p> <p> See manufacturing drawing accompanying the equipment and point 6.8 of this manual.</p> <p>Material included:</p> <ul style="list-style-type: none"> - 1 element carrier (length of trapezoid specified in the order)

- 1 pipe trapeze (on request)
- 2 tubes diameter 38 element holders (according to order)
- 2 limit switches (pre-mounted on main body)
- Other accessories not included

6.3. Loading data

The data required for the calculation of the ceiling load are given in the following tables. When mounting the suspension system, the vertical weight force of the ceiling assembly (the values correspond to the maximum load) must be added to the corresponding values of the suspension system to determine the ceiling load.



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

The table shows the values for the maximum permissible load capacity of the suspension system. The load data of a version can be calculated from the sum of the individual versions.

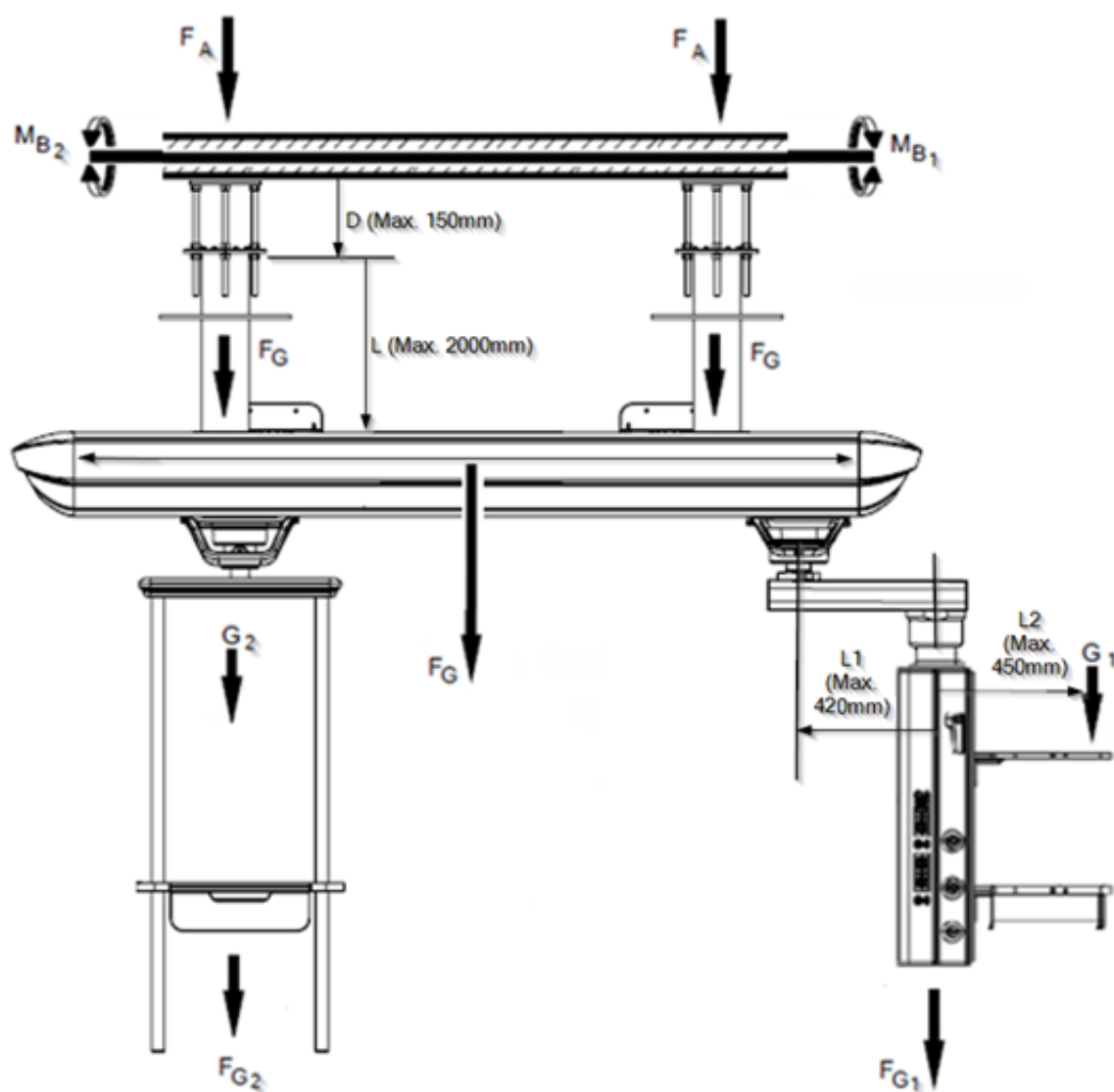


Fig. 4 Load calculation scheme for ABITUS

Suspended headboard	Weight (FG) [N] [N]	Weight (FA) [N] Anchor kit	Max. bending moment MB [Nm] [Nm] [Nm]	Load G [kg]
Downspout. Connecting elements	-	152	-	-
Downspout. Vertical section (L=1000mm)	84.5	-	-	-
Main body. Chassis length 1000mm	402	-	-	500
Main body. End walls	35	-	-	0
Service head without extension arm	Weight (FG) [N] [N]	Weight (FA) [N] Anchor kit	Max. bending moment MB [Nm] [Nm] [Nm]	Load G [kg]

TDSHV vertical service head (750mm)	353	-	441	100
TDSHV vertical service head (1000mm)	383	-	441	100
TDSHV vertical service head (1250mm)	422	-	441	100
Horizontal service head TDSHH (600mm)	373	-	441	100
Service head with extension arm	Weight (FG) [N] [N]	Weight (FA) [N] Anchor kit	Max. bending moment MB [Nm] [Nm] [Nm]	Load G [kg]
TDSHV vertical service head (750mm)	500	-	1063	100
TDSHV vertical service head (1000mm)	530	-	1076	100
TDSHV vertical service head (1250mm)	569	-	1092	100
Horizontal service head TDSHH (600mm)	520	-	1071	100
Trolley for elements	Weight (FG) [N] [N]	Weight (FA) [N] Anchor kit	Max. bending moment MB [Nm] [Nm] [Nm]	Load G [kg]
Trapeze trolley 300m	160	-	150	100
Trapeze trolley 500m	170	-	250	100
Trapeze trolley 700m	173	-	350	100

The load G1 on the service head trays is counted as being positioned at the maximum distance L2 shown in Figure 4. The load G2 on the trolleys is counted as being applied on one of the two structural tubes.

6.4. Mounting of threaded bolts on the interface plate

6.4.1. Installation without false ceiling

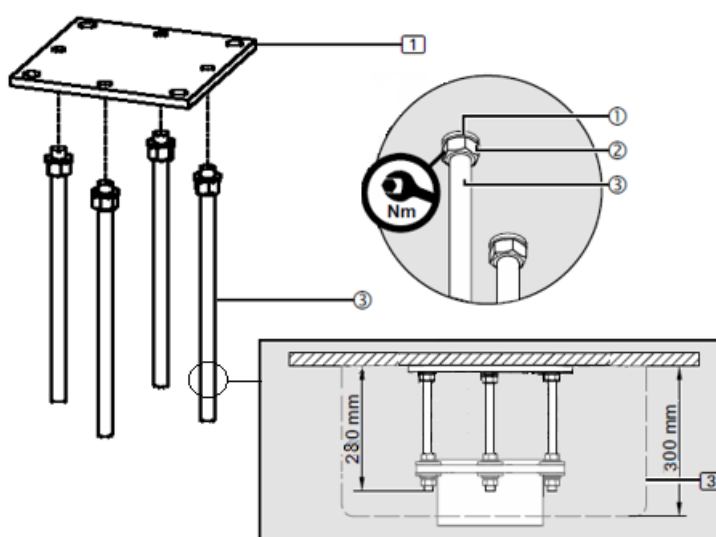


Fig. 5 Mounting of interface plate without false ceiling

- Cut threaded bolts ③ to length

If an interface plate (1) is mounted on the intended slab or structure, the threaded bolts M16 x 350 mm ③ must be cut to size.

- The ceiling trim (3) is later mounted flush with the ceiling and covers the counter plate ④. See figure 12.
- For the ceiling trim (3), which has a height of 300 mm, the 6/12 M16 x 350 mm threaded bolts ③ must be cut to 280 mm. See Fig. 5.
- Lightly deburr the M16 x 350 mm threaded bolts ③ to ensure maximum thread engagement in the interface plate (1).
- Thread 1 M16 hex nut ② each onto the M16 threaded bolts ③ and then fit 1 spring washer ① each.



If the M16 threaded bolts ③ ③ are not completely screwed in, they may come out of the interface plate (1) and cause the system to fall down.

- Check that the shortened M16 threaded bolts ③ are securely fastened at the correct distance from each other and fully screwed into the interface plate 1.



The M16 hex nuts ② must be tightened to 195 Nm.

6.4.2. Installation with false ceiling

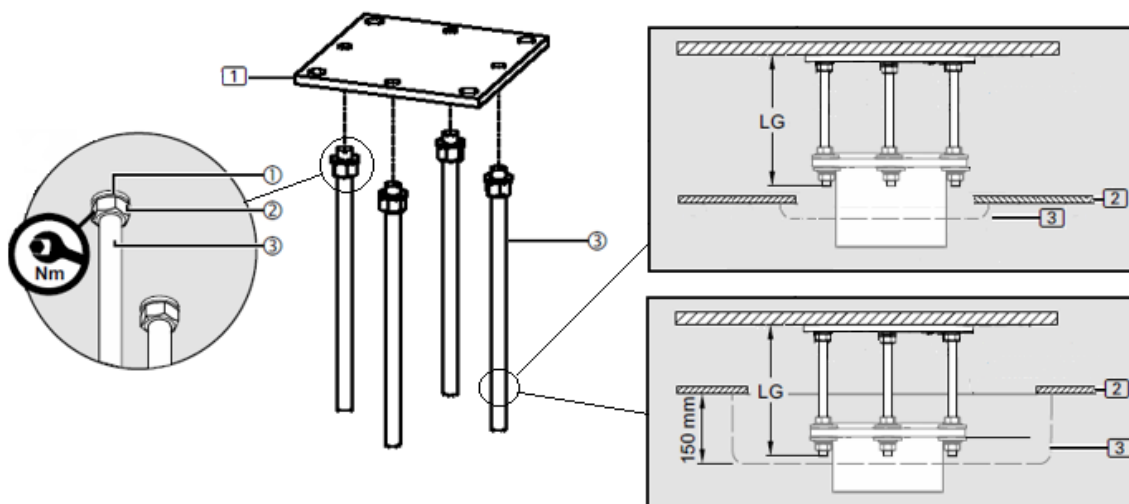


Fig. 6 Installation of interface plate in room with false ceiling

There are two different configurations if a downpipe is installed in a room with a false ceiling. One possibility is that the distance between the floor and the false ceiling completely covers the length LG of the threaded bolts ③, in this case a flat ceiling trim with a height of 10mm is supplied as shown in the upper right part of figure 6. The other possibility is that the distance between the floor and the false ceiling is not sufficient for a correct installation and energy supply passage, in this case a trim of 150mm in height can be ordered (optional) as shown in the lower right part of figure 6.

- Cut the threaded bolts M16 x 350 mm ③ to length if necessary.
- The ceiling trim (3) will be fitted flush with the false ceiling at a later date. It covers the counter plate ④. See figure 14.
- If the threaded bolts M16 x 350 mm ③ have been cut, remove the burrs to ensure maximum thread engagement in the interface plate (1).
- Fit 1 spring washer ① and screw 1 M16 hex nut ② each onto the M16 threaded bolts ③.
- Thread 1 M16 hex nut ② each onto the M16 threaded bolts ③ and then fit 1 spring washer ① each.



If the M16 threaded bolts ③ ③ are not completely screwed in, they may come out of the interface plate (1) and cause the system to fall down.

- Check that the shortened M16 threaded bolts ③ are securely fastened at the correct distance from each other and fully screwed into the interface plate 1.



The M16 hex nuts ② must be tightened to 195 Nm.

6.5. Mounting the downpipe on the interface plate

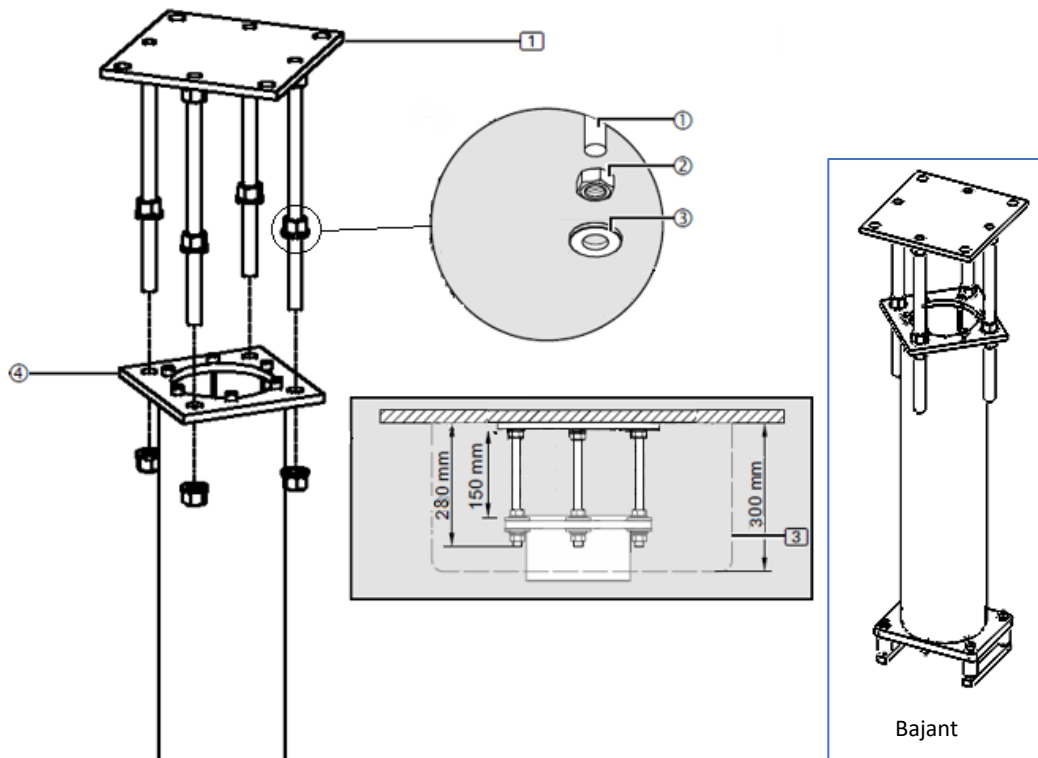


Fig. 7 Installation of the downpipe on the interface plate

- For each M16 threaded bolt ① screw on an M16 hexagon nut ②.

The M16 hex nuts ② must be mounted on the M16 threaded bolts ① at exactly the right distance from each other.

- Adjust the distance between the M16 hex nuts ② and the interface plate from 1 to 150mm.
- Using a digital spirit level, align the M16 hex nuts ② horizontally.
- Fit 1 flat washer with an outer diameter of 34 mm ③.
- Secure the flat washer ③ with adhesive or elastic tape on the threaded bolts ①.
- Fit the downpipe by passing the threaded bolts through the 16.5 mm holes in the counter plate ④.
- Fit a flat washer with an outer diameter of 34 mm ③.
- For each M16 threaded bolt ① screw on an M16 hexagon nut ② to secure the downpipe.

6.6. Disassembly and assembly of covers

The main body of the ABITUS is supplied finished, so for on-site installation, the side walls and top covers must be removed in order to be able to connect the downpipes and, if necessary, fit other accessory equipment (element trolleys).

NOTA

In the case of equipment fitted with service heads, these are already mounted on the main body.

6.6.1. Disassembly and assembly of upper decks

- Using a flat-nosed tool and taking care not to damage the paint on the top covers, remove the bottom covers of the downpipes ①, these are press-fitted. See figure 8.
- Now remove the upper covers of the main body ② which are also snapped on by hand. See figure 8.

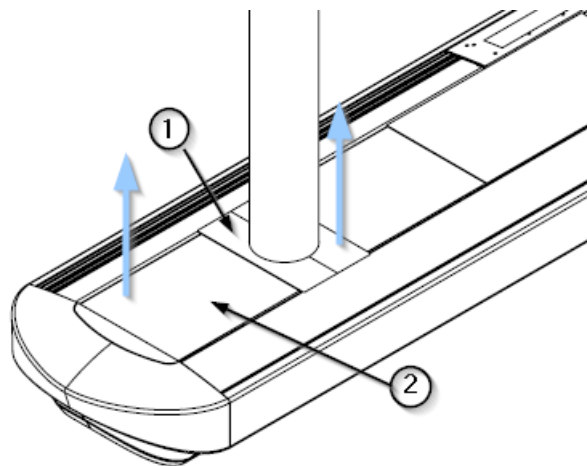


Fig. 8 Removal of main body covers

- To reassemble these covers, carry out the above steps in reverse order.
- First attach the top covers ②. You will hear a sound when the clipping is done. Check that the covers are securely fastened.
- Then fit the lower downpipe covers ① and press them in until you hear them click into place. Check that they are properly secured.

6.6.2. Disassembly and assembly of side walls

- Remove the top cover from the main body as described in section 6.5.1 of this manual.

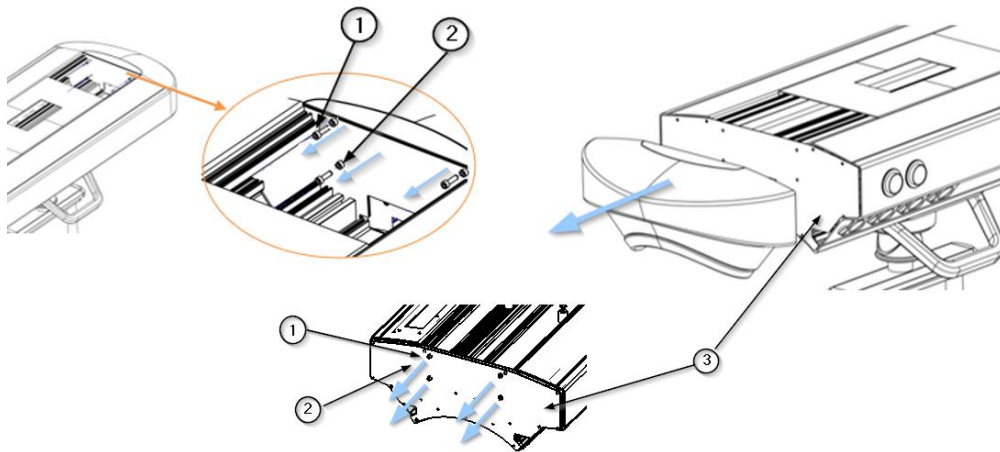


Fig. 9 Disassembly/assembly of end caps on ABITUS main body

- Using a hexagonal tool, remove the 4 M6 x 25 screws (1) and the 4 corresponding washers DIN 9021 (2) as shown in figure 9.
- Carefully remove the side panel and place it in a safe place.
- The end cap bracket (3) is now visible. Remove it by removing the 4 M6 x 25 screws (1) and the 4 corresponding washers DIN 9021 (2) using the same tool as shown in figure 9.
- To reassemble the end caps, carry out the above steps in reverse order.
- First attach the end bracket (3) and secure it with 4 M6 x 25 screws (1) and 4 corresponding washers DIN 9021 (2).
- Then place the end cap in position and secure it with 4 M6 x 25 screws (1) and 4 corresponding washers DIN 9021 (2).

6.6.3. Removal of trims on the carousels

To gain access to the extension arm pivot adjustment screws, the rear trims of the carousel must be removed.

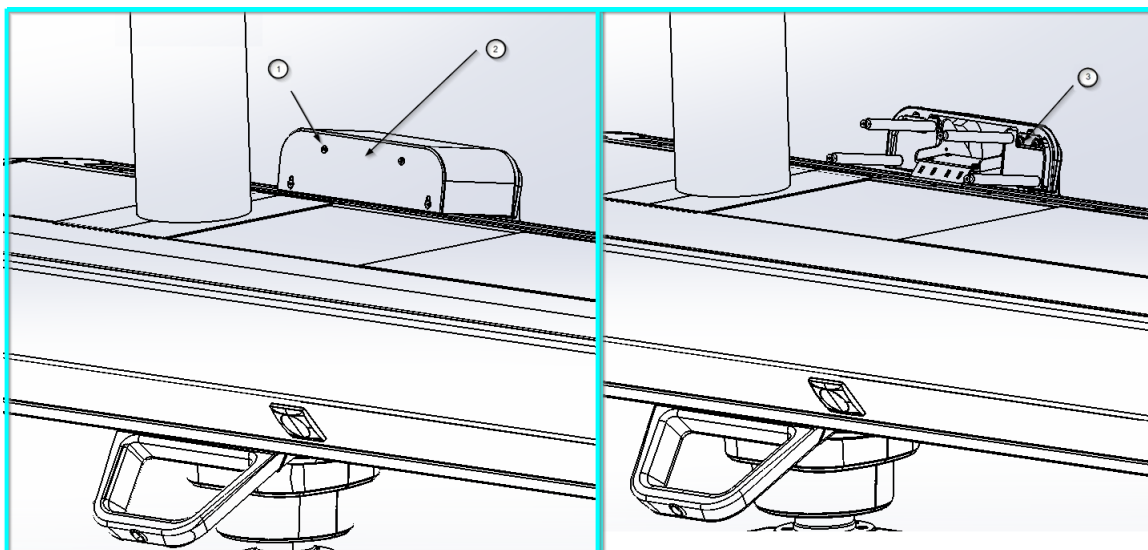


Fig.10 Removal of top trim

- Unscrew the fixing screws ① holding the upper trim ② as shown on the left in figure 10.
- Remove the upper trim ②
- Unscrew the Allen fixing screws ③ from the top of the rear trim ④ as shown on the right in figure 3.
- Unscrew the Allen screws ⑥ securing the trim plates ⑦ and the Allen screws securing the lower part of the rear trim as shown in figure 11.
- Remove the rear trim ④.

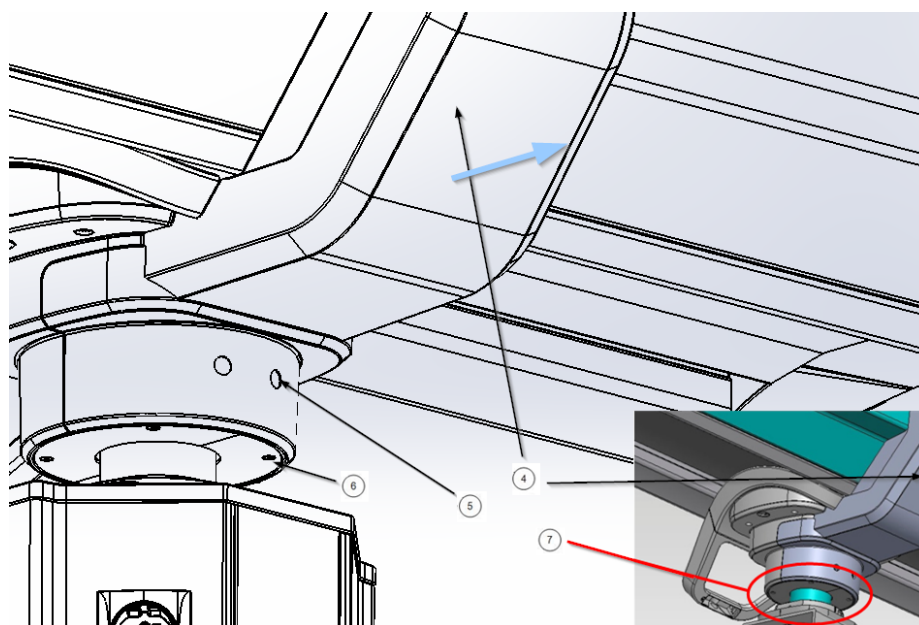


Fig.11 Rear trim removal

6.6.4. Opening and closing of service head covers.

The service head is fitted with hoses for the power supply and for supplying the various medical gas and/or vacuum systems. It also includes a corrugated tube with a guide for the installation of the communication cables provided.

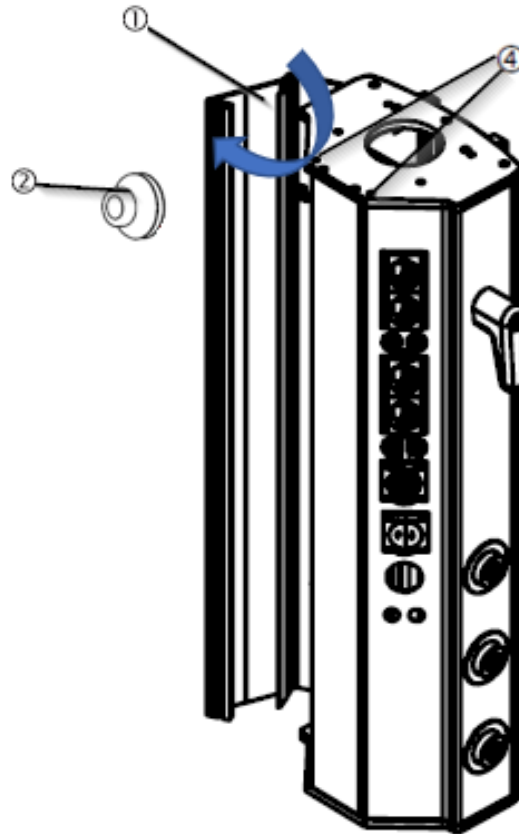


Fig. 12 Opening the service head covers.

- Open one of the side covers of the service head (1) by removing the M4x16 socket head cap screws (4) at the top and bottom. The side cover can now be opened as shown in figure 12, revealing the inside of the service head.



Fold down the cover of the enclosure with the help of a plastic suction cup (2).

- To close the side cover (1), move it into position and tighten the M4x16 socket head cap screws (4).



The M4x16 socket head cap screws (4) must be tightened to 10 Nm.

6.7. Installation of one section of the main body on two downpipes

Inside each suspended head section (main body) there are spacers ①, M8 x 80mm threaded bolts ②, M8 hex nuts ③, S10 lock washers ④ and platens ⑤, which are required for fastening to the downpipes. See picture on the right in figure 13.

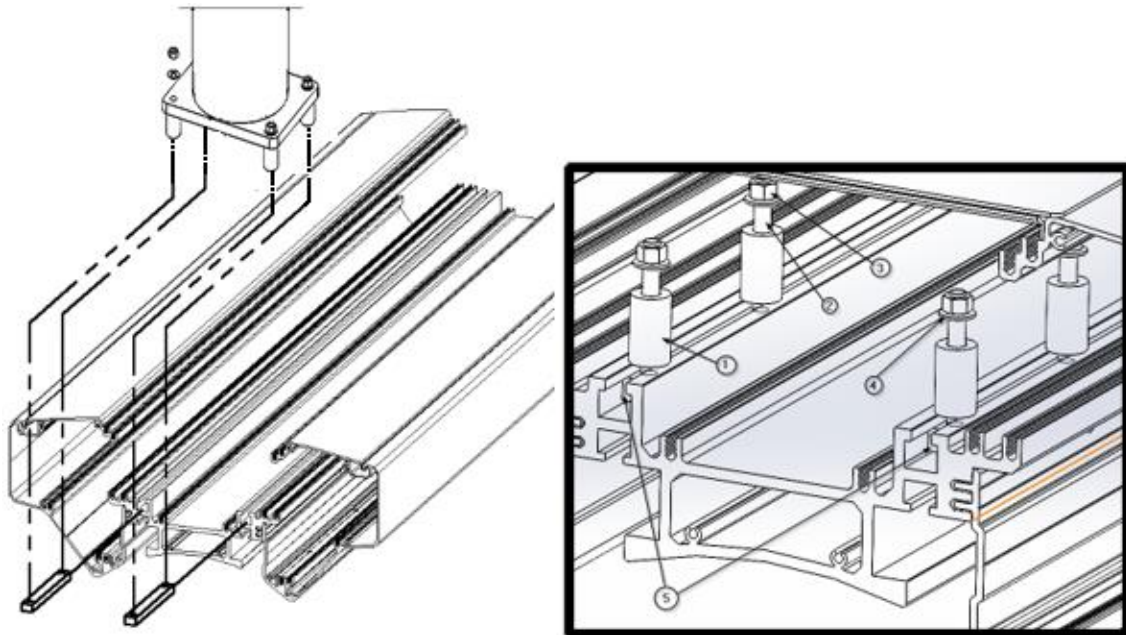


Fig. 13 Anchoring diagram of an ABITUS main body section on a downspout

- Remove the M8 hex nuts ③ ③ and S10 lock washers ④ and store them in a safe place.
- Fit the threaded bolts ② and use them to anchor the suspension chassis to the downpipe as shown in the picture on the left in figure 13, but do not tighten them completely.
- Make sure that the equipment is aligned and level. Then tighten the M8 nuts ③ ③ of all downpipes to a torque of 40 Nm.



The M8 hex nuts ③ must be tightened to 40 Nm.

- Finally, fit the bottom covers of all downpipes to the chassis.

6.8. Assembly of a trolley

This section shows the assembly of a trolley. This element does not come pre-assembled, it must be installed once the main body has been installed in the room where it is to be used.

- Remove the side wall and its bracket as described in section 6.6.2 of this manual.
- Position the first carriage limit switch (the one furthest from the head end) as described in section 6.10.2 of this manual.

- Insert the carriage with the bearings ② into the guide in the centre of the main body ① as shown in figure 14.

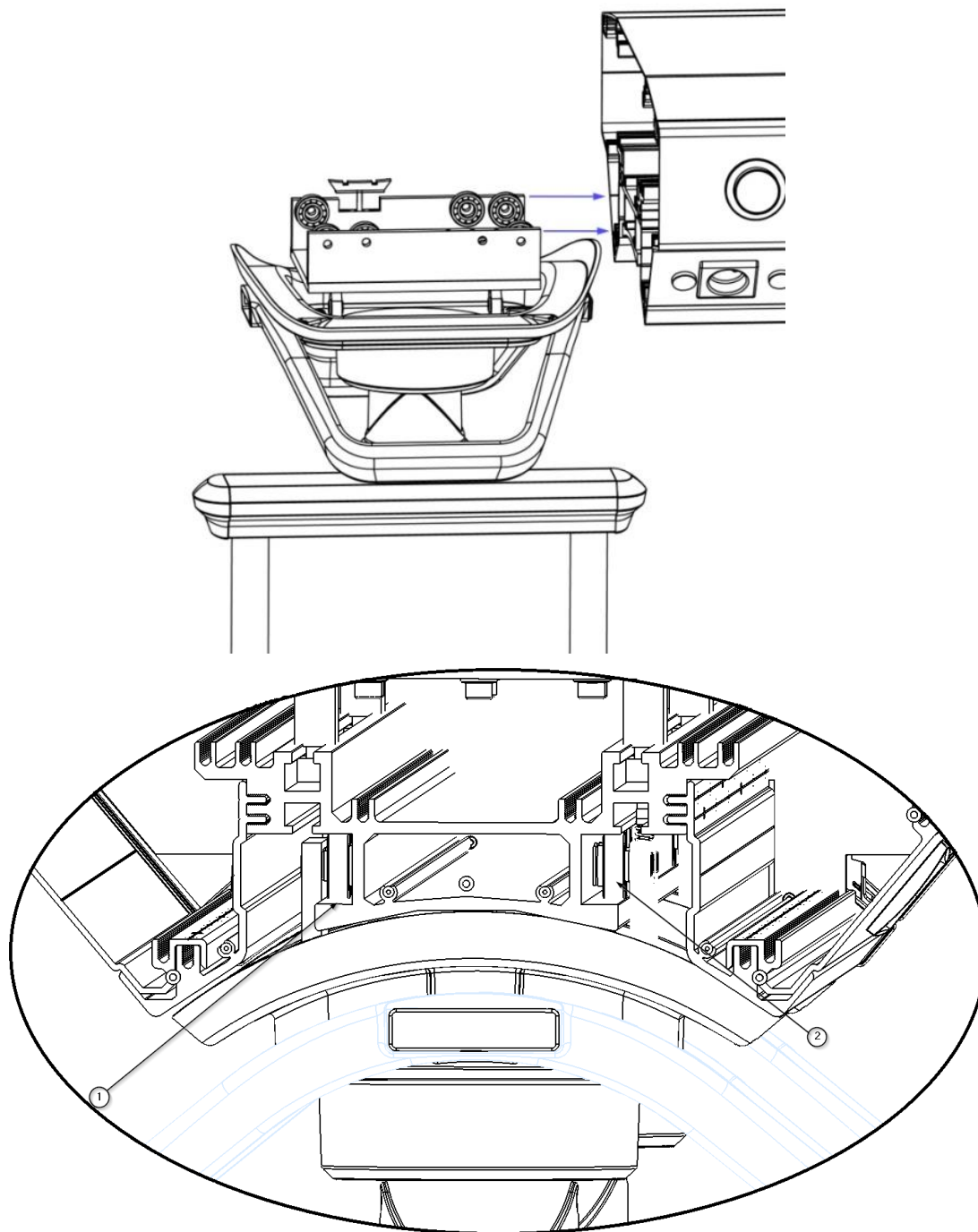


Fig. 14 Assembly of the trolley

- Fit the second limit switch as described in section 6.10.2 of this manual.
- Refit the side wall as described in section 6.6.2 of this manual.

6.9. Cable / hose routing



Before any installation and adjustment work, the pendant system must be disconnected from the mains.

6.9.1. Preparation of supply lines

In order to install the main body of the equipment, the supply lines to the equipment, which have previously been passed through the downpipes, must be prepared.

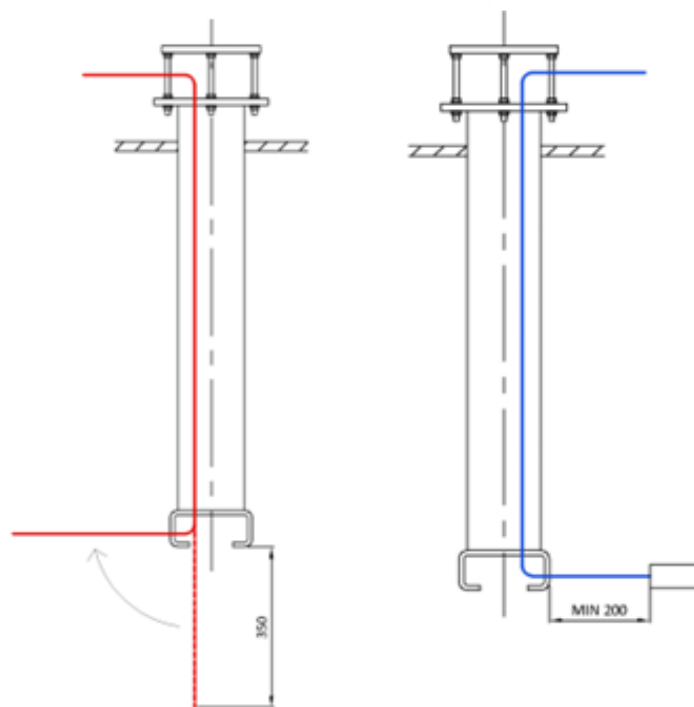


Fig. 15 Preparation of supply lines

In order to be able to work comfortably, the copper pipes should protrude about 350mm below the downpipe. At this point they should be bent in such a way that they are horizontal and above the lower face of the lower anchor of the downpipe. See picture on the left in figure 15.

The electrical cables should protrude about 200 mm from the bottom of the downpipe to ensure that the connection area (where the terminal block is located) can be reached without any problems. See picture on the right in figure 15.

Damaged power cables can carry 230 V electrical voltage that energises the pendant system, and supply gases can escape from damaged supply hoses:

- Check all cables, pipes and hoses for damage. Be sure to insert them carefully without crossing each other, without loops and without kinks.
- Cables and pipes must be positioned in the suspension system in such a way that they are not exposed to tensile stresses.
- Cables and hoses must be routed straight up out of the flange to prevent damage (e.g. chafing of the sheathing) and to allow free rotation.
- Protruding cables and hoses must not be routed in the service head or on the flanges, but must be routed in the interface plate and secured against falling out with cable retainers.
- Electrical cables should be routed according to regional standards (in a spiral coiled tube if necessary).

NOTA

For systems with air brakes, check air supply lines and brake valves for contamination and clean if necessary.

- Cut the brake hoses, \varnothing 4 mm, flat-parallel.
- Brake lines and air supply lines must not be bent.
- Replace damaged or bent brake lines.
- The supply pressure of the air supply ducts at the installation site must be in the range of 4 to 6 bar. The optimum operating pressure is 5 bar.

Power cables, pneumatic lines, earthing and control cables as well as gas hoses are pre-installed in the service head and run through the pendant system. Order-specific cables, including telephone and nurse call cables, must be routed separately through the pendant system. See Figure 16.

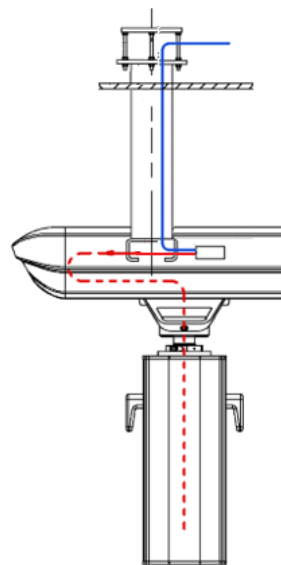


Fig. 16 Routing of electrical and gas hoses.

6.9.2. Connection of pneumatic brakes

To connect the pneumatic brakes, remove the upper cover of the main body.



See section 6.5.1 of this manual.

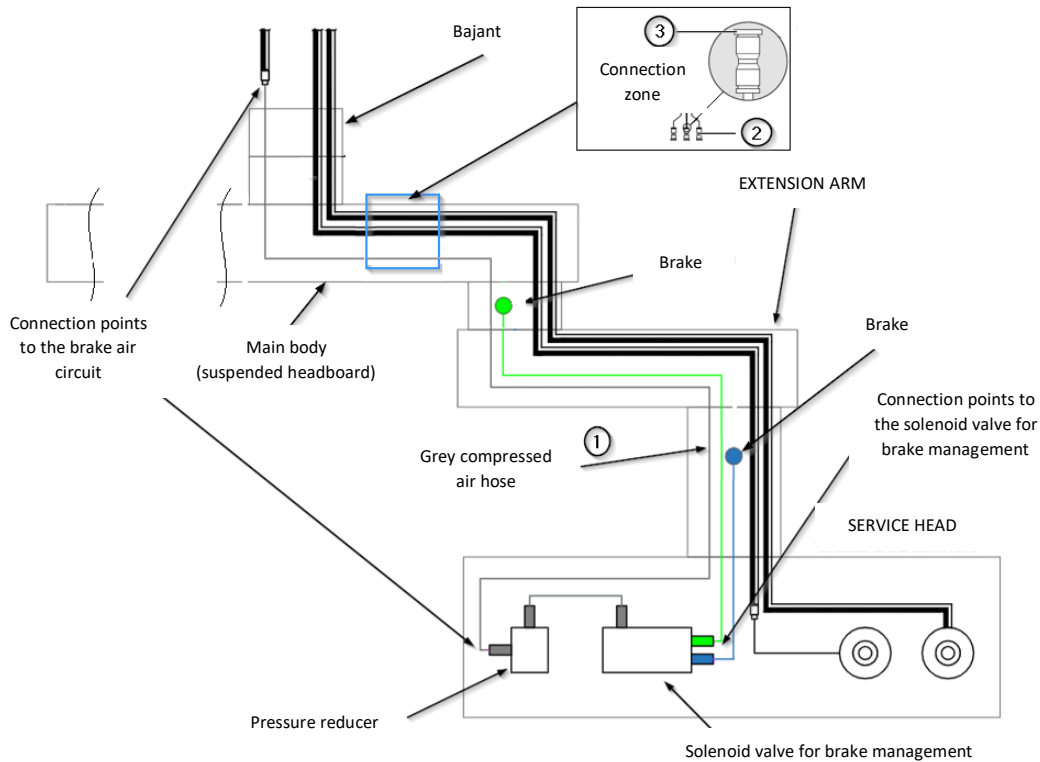


Fig. 17 Routing of air hoses for brakes.

The pneumatic brake hoses ① are pre-mounted on the suspension system and connected to the brake connection points. If necessary, the brake hoses ① are fitted in the form of a spiral tube.

The pneumatic supply line must be depressurised:

- The brake tubes ① may be too long depending on the installation position of the rack. If this is the case, cut the brake hoses ① to length.
- To install the brake hoses, push them into the brake connection point. If the brake pipe is correctly positioned, it can no longer be removed from the brake connection point.
- To disengage the brake hoses at the connector ② press the release mechanism ③ and then remove the brake hoses.
- Plug the air supply hose (BLACK mark) into the connector ② (BLACK mark).
- Plug the brake hose (GREEN marking) into connector ② (GREEN marking).

- Plug the brake hose (BLUE marking) into connector ② (BLUE marking).

6.9.3. Installation of gas hoses and evacuation of anaesthetic gases

To connect the gas circuits, remove the top cover of the main body.



See section 6.5.1 of this manual.

- Ensure that gas types are correctly assigned

The gas type is indicated by colour on the gas supply hoses. These hoses are fitted with a sealing plug which can only be removed during installation.

- Check hoses and lines for dirt and clean them with oil-free air.
- Ensure that cables, hoses and conduits are assigned to the correct supply outlets.

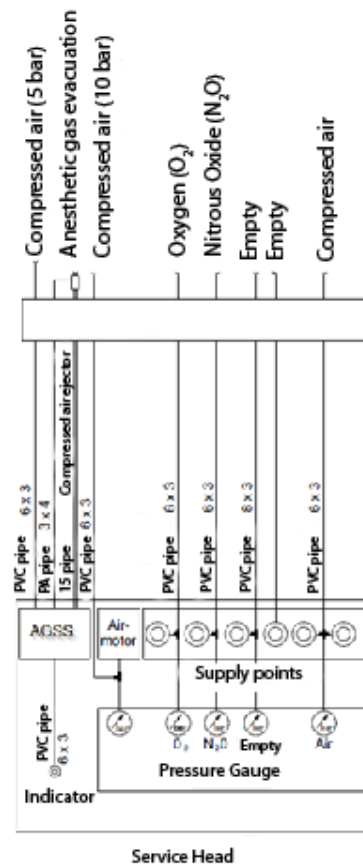


Fig. 18 Example of connection of gas hoses and anaesthesia gas evacuation systems

- Attach a hose clamp to the gas supply hose, remove the sealing plug and push the hose into the correct gas supply outlet.
- Up to 3 gas supply hoses and up to 2 vacuum hoses can be connected to one gas valve using Y-connectors.

- Press the hose clamp and check that it is securely in place.
- Connect and secure the anaesthetic gas suction hoses and the air motor exhaust air hoses.
- Perform a gas type test by following these 5 points:
 1. gas outlets and marking according to EN ISO 9170-1 or EN ISO 9170-2
 2. Leakage according to EN ISO 11197
 3. Congestion according to EN ISO 7396-1 or EN ISO 7396-2
 4. Solid contamination according to EN ISO 7396-1 or EN ISO 7396-2
 5. Gas type according to EN ISO 7396-1 or EN ISO 7396-2

6.9.4. Connection of the different electrical circuits

To connect the electrical circuits, remove the top cover of the main body.



See section 6.5.1 of this manual.

The electrical connection is always made in the connection area shown in figure 17. This is located on the main body, next to one of the downpipes. All electrical hoses are numbered to identify the circuit to which they belong. The colour of the cable will indicate whether it is an earth connector, a neutral or a phase.



Before any installation and adjustment work, the pendant system must be disconnected from the mains.

- Cut all green/yellow earthing wires (2.5 mm² and 10 mm²) to the correct length.
- Connect them to the 2.5 mm² or 10 mm² series terminals on the earth terminal block provided in the connection area.
- All earthing cables must be securely installed in the strain relief mechanisms.
- Connect the power wires to the terminal block as illustrated in the wiring diagram supplied with the equipment.



See installation drawing(s) accompanying the equipment

- All power cables must be securely installed in the strain relief mechanisms.
- Carefully check that the power cables are not trapped or kinked during the entire translation and rotational movement of the service heads.

6.10. Adjustment of moving parts

6.10.1. Limitation of the rotation angle on carousel and/or arms

Once the rear trim has been removed, the steps ① for adjusting the swivel angle of the carousel limited by the hexagon socket head cap screws ② are visible. The following figure shows the rotation of a column with extension arm, the case for a column without extension arm is identical.

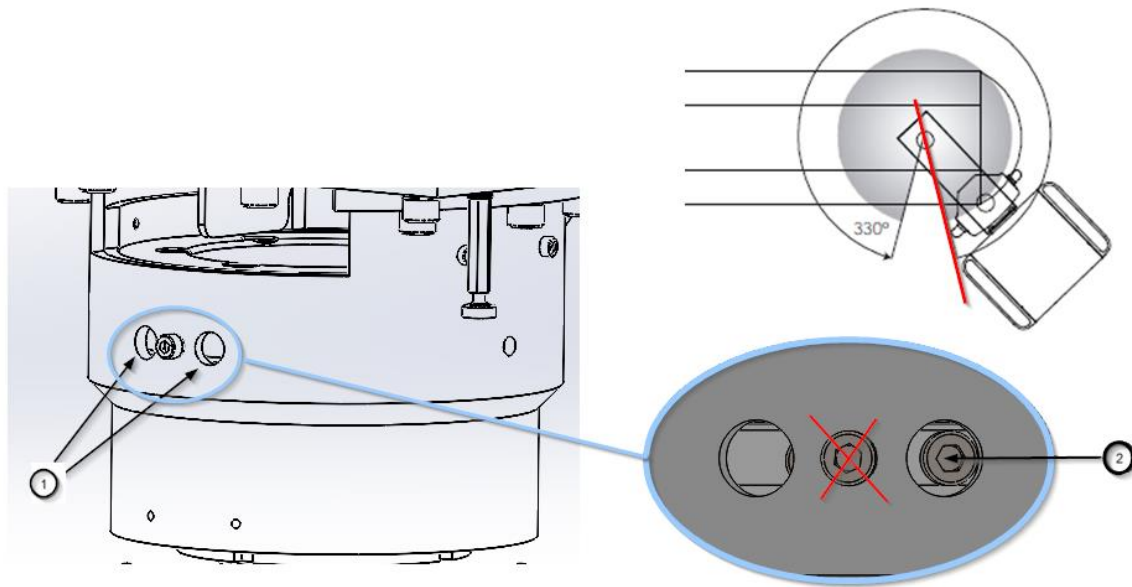


Fig.19 Schematic diagram of rotation control



Do not unscrew the central Allen screw (marked with a red cross in figure 19), otherwise the carousel will rotate freely and the rotation can no longer be limited.

- To adjust the right pivot stop on the column, move the column to its maximum position as shown in the top right of figure 19.

The stop socket head cap screw ② will then appear as shown in the lower part of figure 19 (detail at the bottom right of the figure).

- Unscrew and remove the Allen screw ②.



As long as the Allen screw ② is not in place, the extension arm rotates freely.

- Bring the column to the desired new maximum position giving sufficient clearance (the space of a fist) as shown in figure 20.

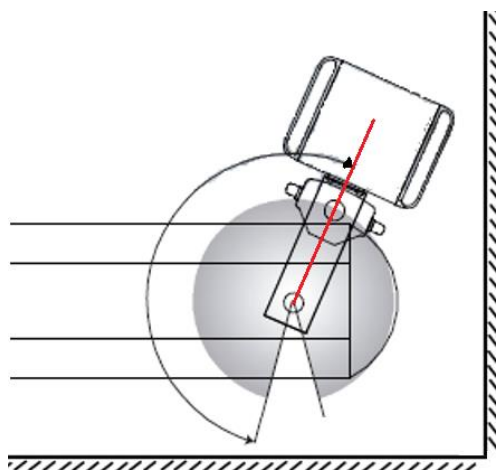


Fig.20 Fixing the right-hand pivot stop of a column with extension arm.

- Insert the Allen screw (2) and screw it back in. The right-hand pivot stop of the column is now complete.

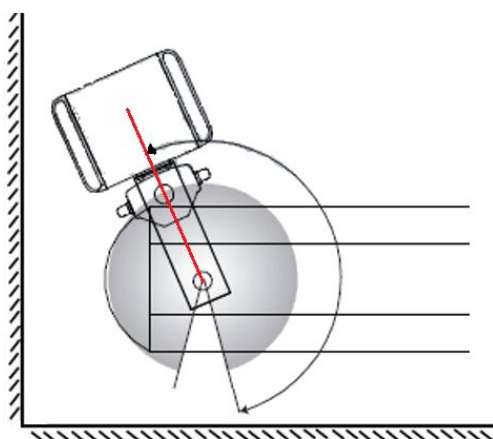


Fig.21 Fixing the left pivot stop of a column with extension arm.

- If necessary, adjust the left-hand rotation. To do this, follow the steps shown in this point, bearing in mind that to set the left-hand stop you must bring the column to the maximum desired position for left-hand rotation and then insert the previously removed Allen screw ② as shown in figure 21.
- Refit the rear trim and the upper carousel trim.

6.10.2. Adjustment of limit switches for carousels and carriages

The carousels and carriages of ABITUS equipment can slide freely over the entire length of the main body section on which they are installed. It is necessary to limit their travel in order to ensure that these elements do not conflict with the patient and operator space. These elements are pre-installed at the factory, but must be moved to the desired position. See figure 22 and 23.

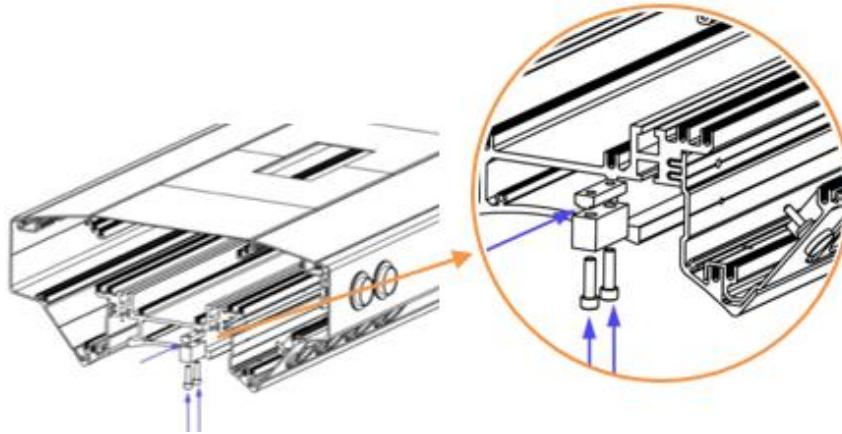


Fig.22 Adjusting the travel limit switches.



The socket head cap screws M8 - DIN EN ISO 10642 must be tightened to 40 Nm.

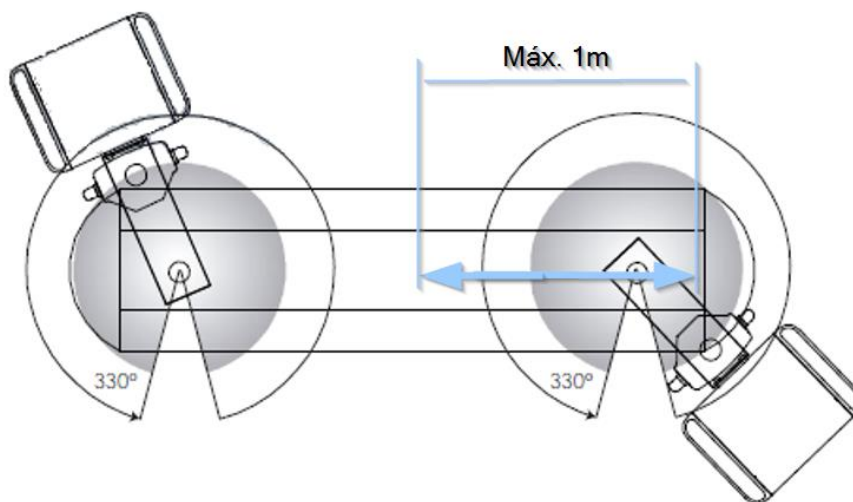


Fig.23 Adjusting the travel limit switches. Maximum stroke


7. Installation checks

When making adjustments to the equipment, it is necessary:

- Check that the relevant medical gas shut-off valves are properly closed and ensure that the system cannot be reopened.
- Verify that the system is electrically disconnected and take measures to ensure that the system cannot be reconnected.




CAUTION: Failure to comply with this point will cause serious damage.

 Before any installation and adjustment work, the pendant system must be disconnected from the mains.

7.1. Check the technical characteristics of the equipment to be installed. Weights, torques.


Before proceeding with the installation of the equipment, it must be checked that the surface on which the equipment is to be installed meets the space and resistance requirements according to the characteristics of the equipment in question.

 See point 6 of the user and cleaning manual supplied with the equipment.


7.2. Check the condition of the cables and hoses in the system and the rotation of the arms.

If the system is equipped with extension arms on the carousels, before installing the equipment, check that the cables and hoses of the system are not stressed or kinked. There is a risk of destroying or damaging the extension arm cables if an extension arm is rotated more than 360 degrees:

- Do not rotate the extension arms more than 360 degrees.
- If necessary, limit the swivel range of the carousels and arms.


 See section 6.8.1 of this manual.


By default, the system is supplied with the 2 stops ② and the fixing screw ① pre-assembled as shown in figure 23 of item 6.8.1.

 At least 1 ball stopper must be fitted to prevent the internal power cables from twisting.

7.3. Mechanical test

It must be checked that each of the anchorage points is properly fixed to the mounting surface and that there is no displacement of the equipment.

 Personal injury may result from falling equipment.

 See section 6.4 and 6.6 of this manual.

7.4. Check service head enclosure.

Check that each element of the service head enclosure that has been removed for the installation operations described in this manual is properly fixed and secured in its intended position.

- Checking of openings, closings, foldings, displacements.



See section 6.5.4 of this manual.



The use of gloves is recommended as minor personal injury may occur.

7.5. Mechanical crash test

Once the system has been installed, it must be checked to ensure that no collisions can occur with:

- other hanging systems,
- ceilings or walls,
- other equipment

If necessary, stroke adjustment of carousels and trolleys and adjustment of turns.



See section 6.8.1 and 6.8.2 of this manual.

7.6. Gas circuit test.

The equipment must be tested according to the current standards, EN ISO 7396-1_2016 and EN ISO 7396-2_2007 by qualified personnel.

The medical gas piping system shall be checked:

- Watertightness
- Integrity
- No crossovers between circuits.
- Good functioning of the gas intakes

These tests shall be carried out at operating pressure.



CAUTION: Danger of metallic element impact due to faulty disconnection, can cause serious personal injury.

7.7. Electrical circuit tests.

Once the equipment has been installed, power must be supplied to each of the circuits provided and a test must be carried out to check that all the mechanisms provided in the circuit in question, and only these, are supplied with voltage.

- Check continuity of protective earth wiring.



DANGEROUS VOLTAGE: To avoid risk of electric shock, equipment must be connected to a protective earth. Failure to do so may result in personal injury.



See manufacturing drawing(s) accompanying the equipment

8. Regulations

8.1. Team ranking

According to the new **MDD** regulation **93/42/EEC** concerning medical devices, this product family is classified as:

- Class IIb, by Annex II, excluding section 4, regulation 11.
- Protection level IP20 according to IEC 60529

Equipment intended for continuous operation.

8.2. Reference standards

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

ISO11197: Medical supply units.

IEC 60601-1: Medical electrical equipment. General requirements for basic safety and essential performance.

IEC 60601-1-2: Medical electrical equipment. Part 1-2. General requirements for basic safety and essential performance. Collateral standard. Electromagnetic disturbances.