

Maintenance Manual

Volista

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Maquet SAS

Subject to technical changes.

The illustrations and technical specifications provided in this manual may, on account of future product developments, differ slightly from the actual product supplied.

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1 Introduction

1.1 Preface

Dear Installers:

- Technician must be trained and accredited by Getinge.
- This document is the property of the Getinge company, and may not be reproduced, in whole or in part, without our permission. This document was produced with the assistance of the company's technical department in France. It may be improved thanks to your remarks, and extended for the different installations you encounter, to produce an up-to-date reference document for servicing.

Send any correspondence to:

Maquet SAS
Parc de Limère
CS 10008 - Avenue de la Pomme-de-Pin
Ardon
45074 ORLÉANS CEDEX 2, France
Tel.: +33 (0) 2 38 25 88 88
Fax + 33 (0) 2 38 25 88 00

Given the confidential nature of the information in this document, it is distributed exclusively to customers and installers of Getinge products.

- Make sure that you have the latest versions of these documents. Check with the Getinge network to confirm this is correct.
- Make sure that your subcontractor is qualified for this task and ask for written proof of certification. Perform regular inspections at the subcontractor's premises and verify for your own organisation the compliance of the maintenance performed.
- Getinge may not be held liable for any damage or injury resulting from failure to follow these recommendations.

1.2 Liability

Modifications to the product

The product must not be modified in any way without the prior written consent of Getinge.

Compatibility with other medical devices

Only medical devices approved in accordance with IEC 60601-1 or UL 60601-1 should be installed on the system.

The compatible accessories and their technical specifications (e.g., maximum weight, etc.) are detailed in the corresponding chapter.

1.3 Other documents relating to this product

- Volista Installation Recommendations (Ref. ARD01786)
- Volista Installation Instructions (Ref. ARD01784)
- Volista Instructions For Use (Ref. ARD01781)
- Volista Repair Instructions (Ref. ARD01782)
- Volista Decommissioning Instructions (Ref. ARD01785)

1.4 Symbols used in this manual

1.4.1 Cross-references

References to other pages of the manual are identified by the “▶” symbol.

1.4.2 Reference numbers

Reference numbers in illustrations and text are shown in a square box 1.

1.4.3 Actions and results

Actions to be performed by the user are listed with sequence numbers; the “▶” symbol is used to show the result of an action.

Example:

Prerequisites:

- The sterilisable handle must be compatible with the product.
- 1. Fit the handle to the mount.
 - ▶ A click is heard.
- 2. Turn the handle until it locks into place with a second click.

1.4.4 Menus and buttons


Menu and button names are shown in **bold**.

Example:

1. Press the **Save** button.
 - ▶ The changes are saved and the **Favourites** menu is displayed.


1.4.5 Hazard levels

The text in safety instructions describes types of risk and how to avoid them. Safety instructions are classified into the following three levels:

Symbol	Hazard level	Meaning
	DANGER!	Indicates a direct and immediate risk that may be fatal or cause very serious injuries potentially leading to death.
	WARNING!	Indicates a potential risk that may cause injuries, health hazards or serious material damage leading to injuries.
	CAUTION!	Indicates a potential risk that may cause material damage.















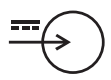

Tab. 1: Hazard levels of safety instructions

1.4.6 Indications

Symbol	Indication type	Meaning
	NOTE	Additional assistance or useful information not resulting in the risk of injuries or the risk of material damage.

Tab. 2: Types of indications in the document

1.5 Symbols used on the product

	Follow the instructions for use (IEC 60601-1:2012)		DC output
	Follow the instructions for use (IEC 60601-1:2005).		Standby
	Follow the instructions for use (IEC 60601-1:1996).		Do not discard with conventional waste
	Manufacturer + date of manufacture		Medical Device (MD) marking
	Product code		Unique device identification
	Product serial number		CE marking (Europe)
	AC input		UL marking (Canada and United States)
	DC input		UR marking (Canada and United States)

Tab. 3: Symbols used on the product

1.6 Waste management

During servicing procedures, all packaging related to the replacement of parts, as well as all replaced wear parts, must be handled in an environmentally responsible manner and recycled appropriately.

Do not dispose of these products as unsorted municipal waste; they must be sorted for subsequent recycling, re-use or reclamation.

All electrical and electronic components used during servicing must be processed in an environmentally responsible manner, in line with applicable local standards.

1.7 Revision history

- Integration of the WPS power supply
- Adjusting the top stop of the Oasys spring arm
- Overall updating of the Maintenance Instructions
- Addition of the estimated maintenance time
- Integration of VCSII lighting
- Updating of safety alerts
- Integration of the Valia spring arms
- Inspection of safety labels in the maintenance protocol

2 Safety instructions

**WARNING!**

Risk of electric shock

Anyone not trained in installation, maintenance, repair or decommissioning operations is exposed to the risk of injury or electric shock.

Installation, maintenance, repair and decommissioning of the device or components of the device must be performed by a Getinge technician or a Getinge-trained service technician.

**WARNING!**

Risk of infection

A servicing or cleaning operation may result in contamination of the surgical site.

Do not perform servicing or cleaning operations when the patient is present.

**WARNING!**

Risk of infection

If no decontamination is carried out on the device before servicing work, there is a risk of infection for anyone handling the device or any of its components.

Make sure that the device is fully decontaminated before any servicing work is conducted.

**WARNING!**

Risk of burns

During servicing operations, certain accessible parts may be hot immediately after use of the device.

Allow the device to cool down before performing any service.

**WARNING!**

Risk of injury

Parts (e.g. tools, screws and colts) are liable to fall during a technical procedure.

Please limit your presence under the device during technical procedures, and use the appropriate safety equipment (e.g. safety hat, safety glasses).

**WARNING!**

Risk of infection

Lightweight parts from the device may fall onto the surgical site.

Check that all fastenings, covers, cover plates and bumpers on the device are properly in place.

**WARNING!**

Risk of electric shock or injury

The use of screws or spare parts other than those supplied by the manufacturer may damage the device.

Use only screws and spare parts supplied by the manufacturer.

**CAUTION!**

Risk of malfunction of the device

The use of wireless accessories other than those supplied or specified by the manufacturer can affect the operation and performance of the device.

Use only the wireless accessories specified by Getinge.

**CAUTION!**

Risk of equipment damage

If adjustments are made incorrectly or not at all, the lighthouse or installed equipment may drift.

Make all adjustments (balance, stop and brakes) during installation and then after all maintenance operations.

3 Technical specifications

The technical specifications can be viewed in:

- Installation Instructions (<https://swp-linkone.getingegroup.local/>):

Mechanical systems (Mechanism, Tightening torques), Electrical systems for installation.

- Instructions for Use (<https://eifu.getinge.com/fr/>):

Optical, Electrical, Mechanical, Video systems of the product in operation.

3.1 VPS power supply connection diagrams

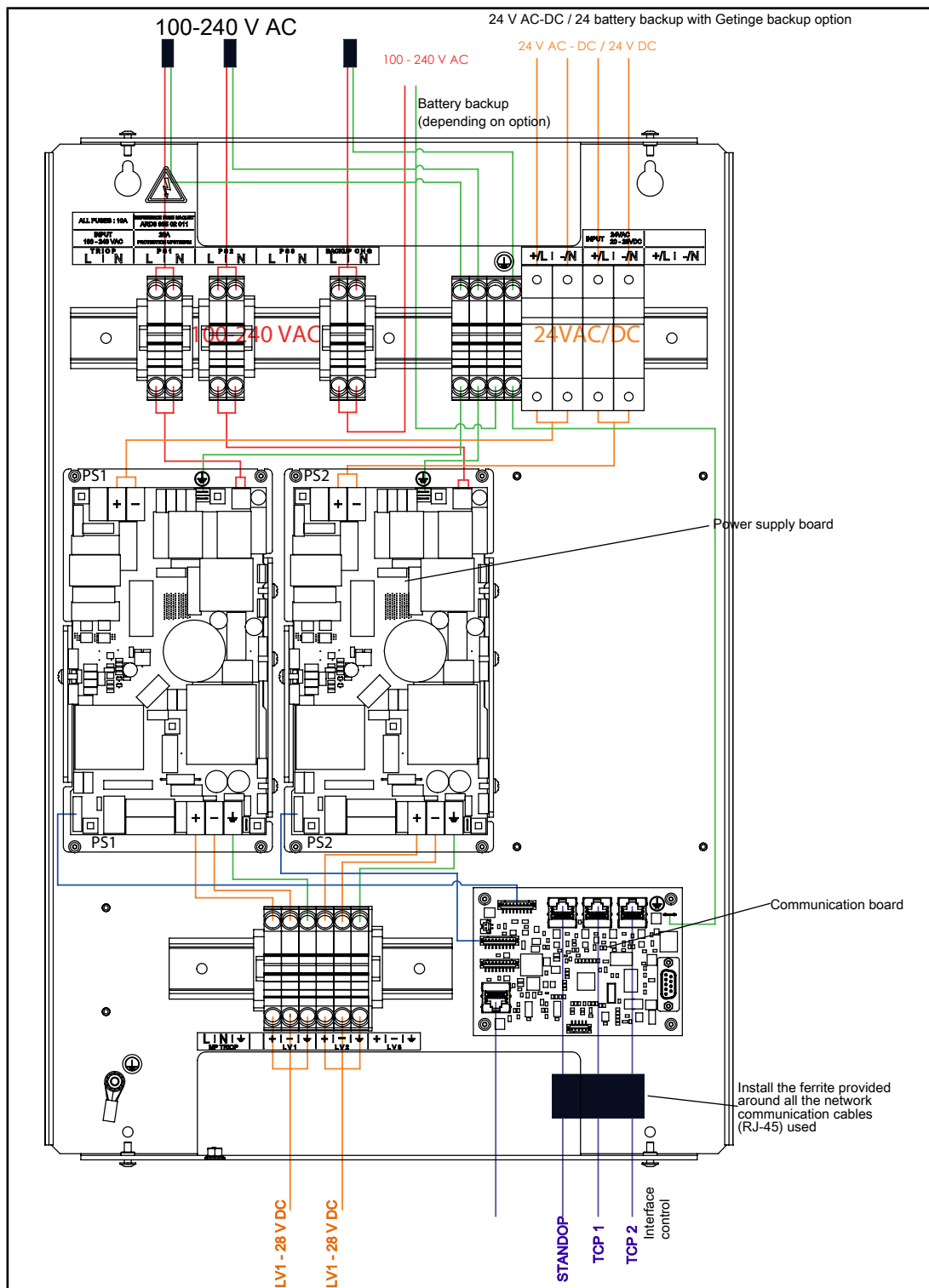


Fig. 1: VPS power supply connection diagram

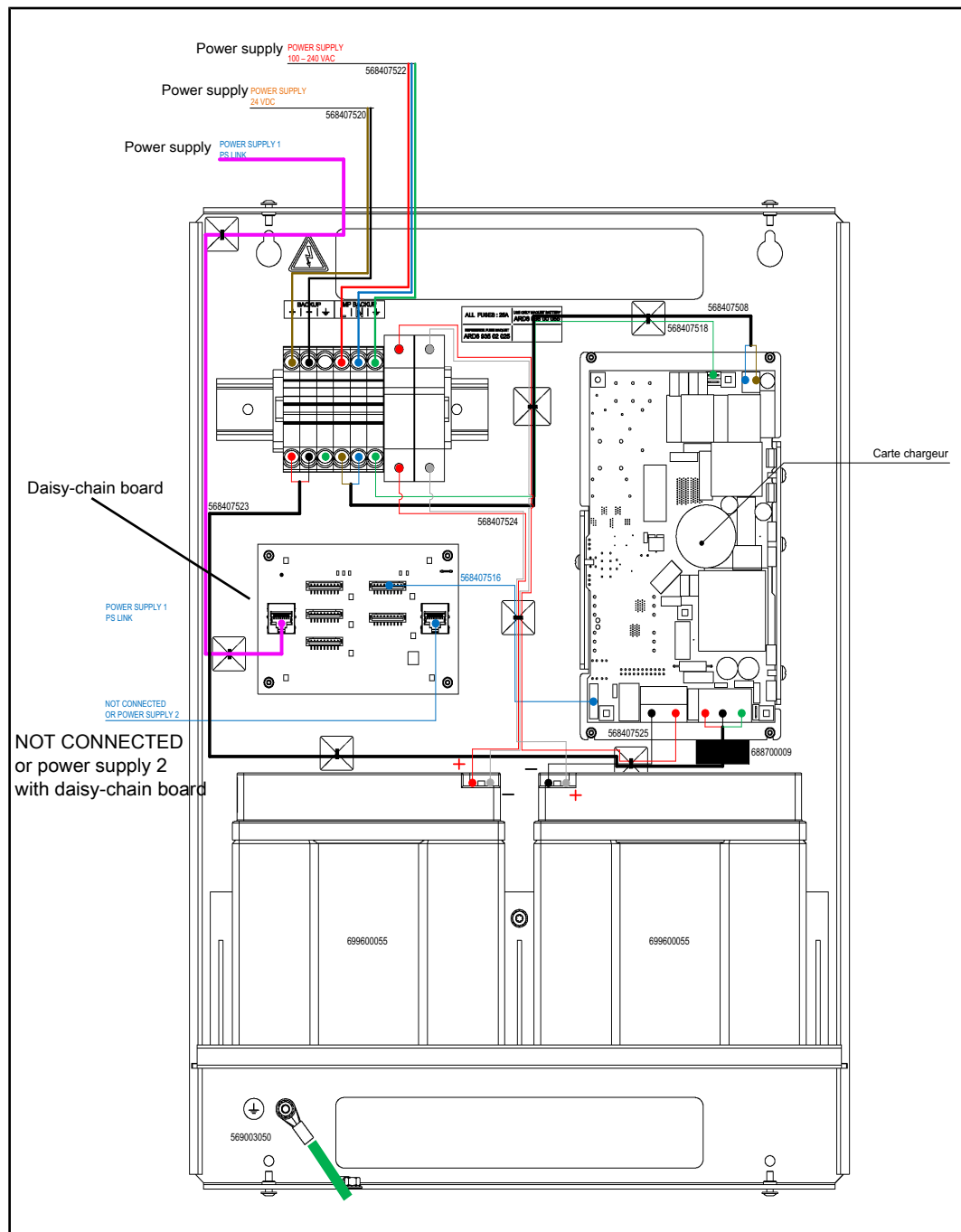


Fig. 2: Getinge Backup connection diagram

Connecting the dual-channel VPS power supply ceiling-mounted enclosure manufactured before December 2017

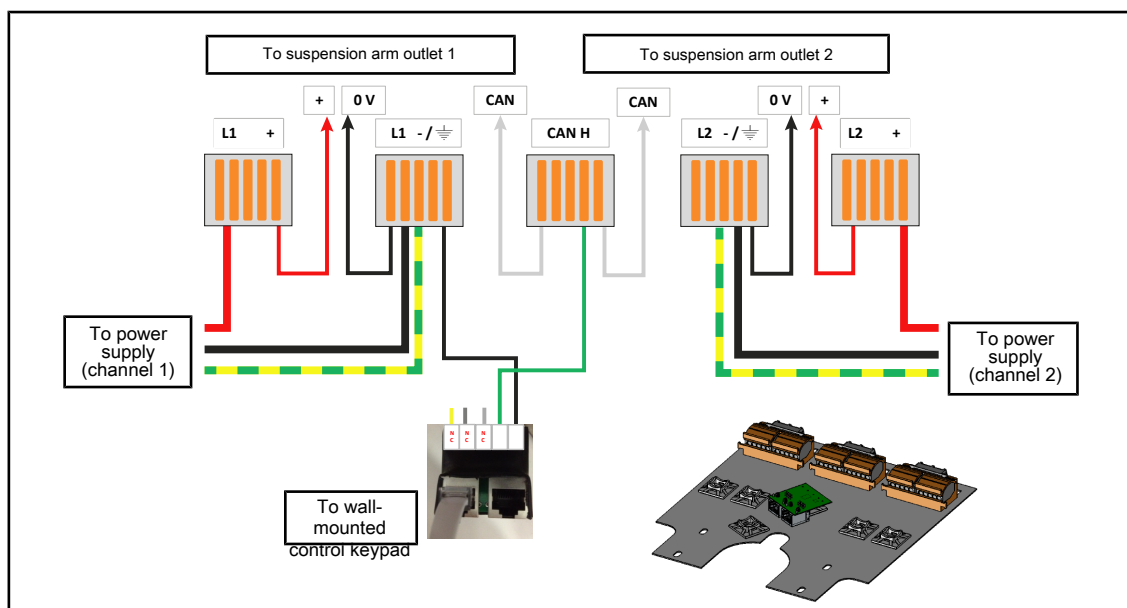


Fig. 3: Connecting the EPS power supply ceiling-mounted enclosure manufactured before December 2017

3.2 EPS power supply connection diagrams

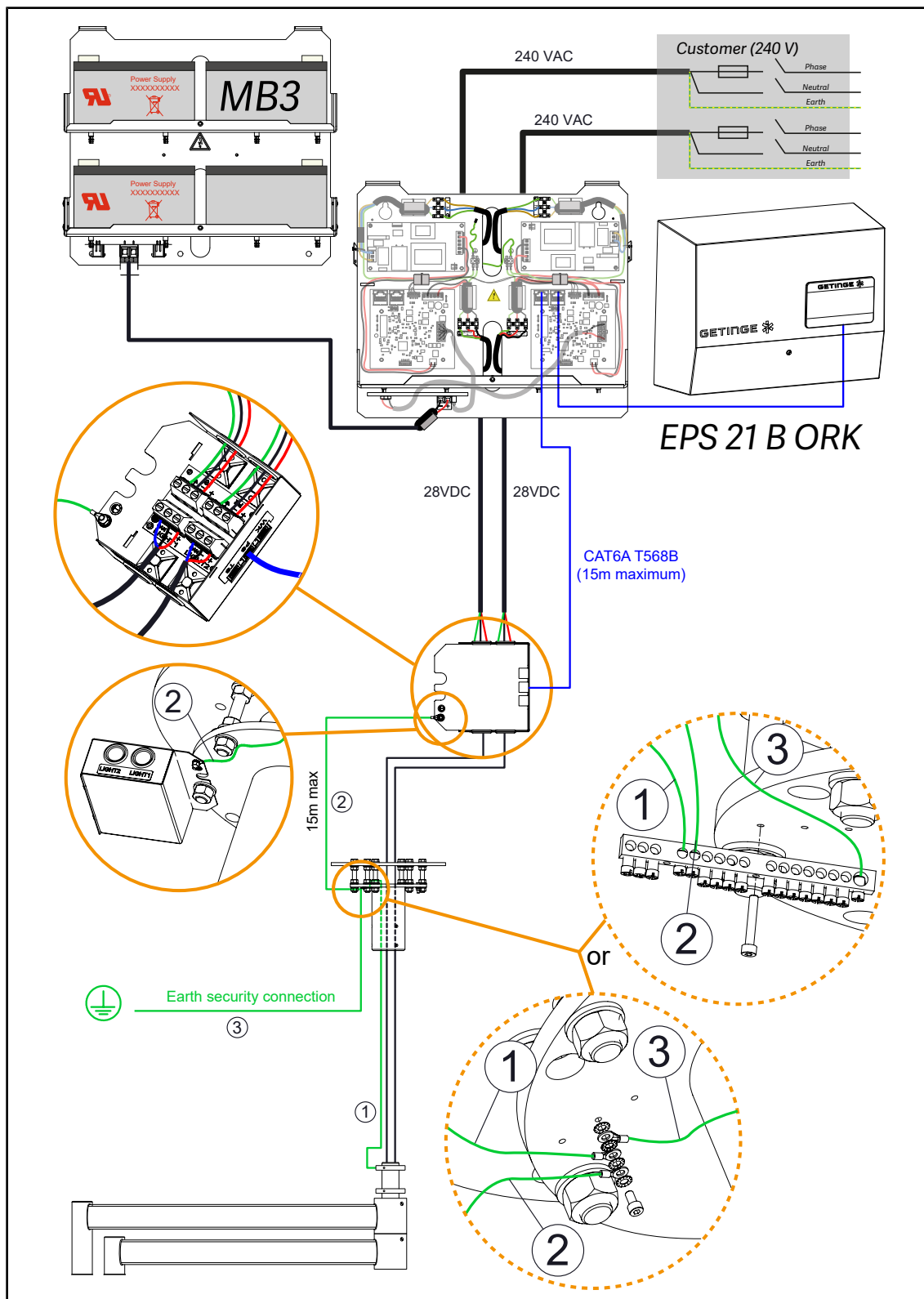


Fig. 4: Global connection diagram of ORK EPS power supply with backup

3 Technical specifications

EPS power supply connection diagrams

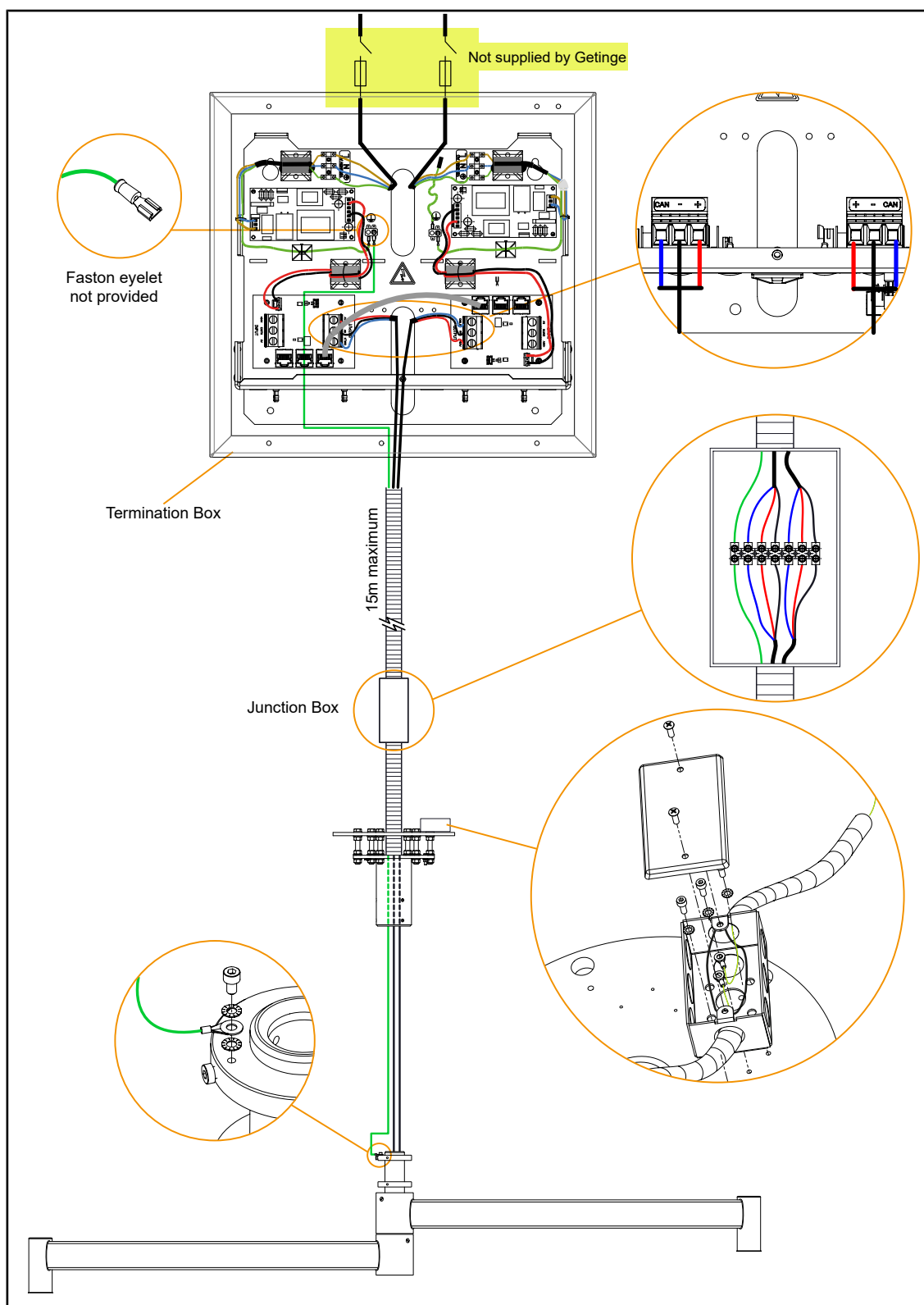


Fig. 5: Global connection diagram of US EPS power supply

Connecting the dual EPS power supply without backup

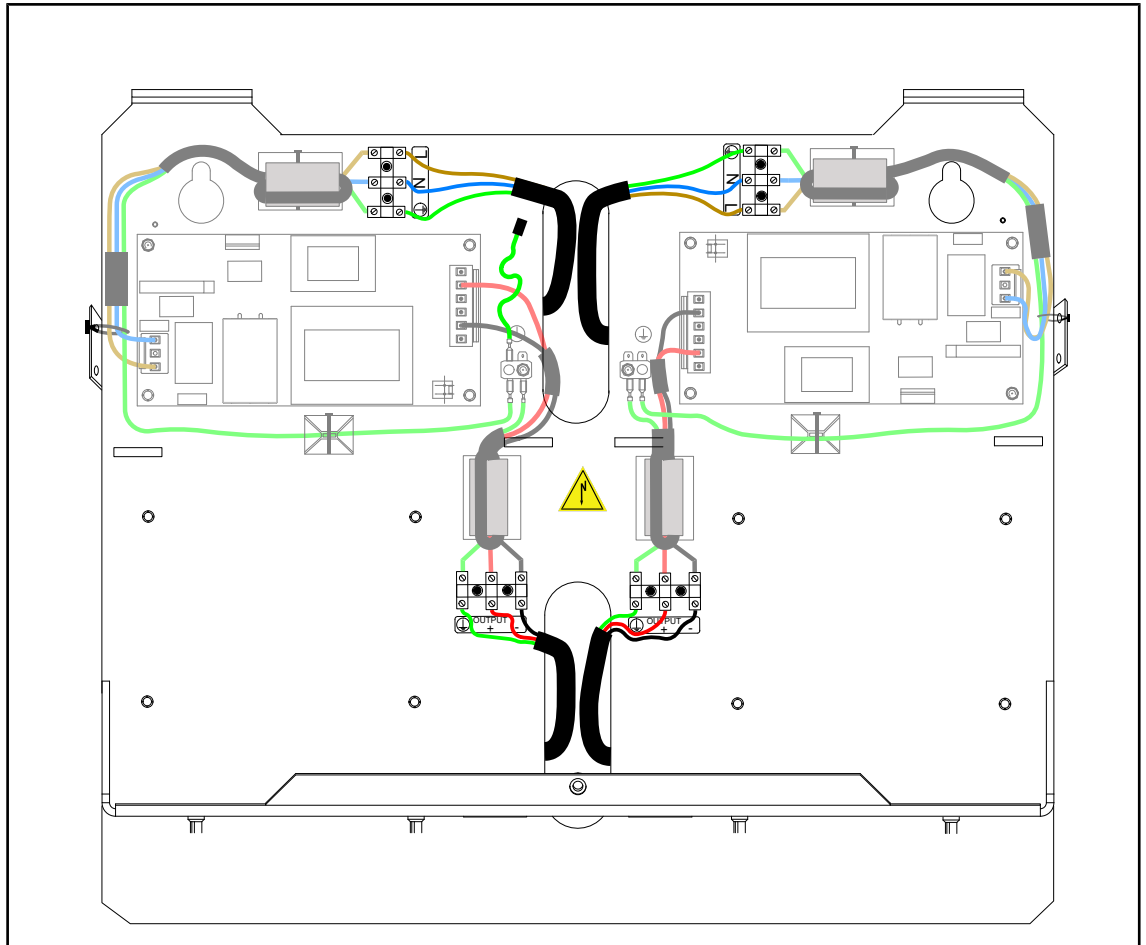


Fig. 6: Connecting the dual EPS power supply without backup

Connecting the dual EPS power supply with Maquet backup

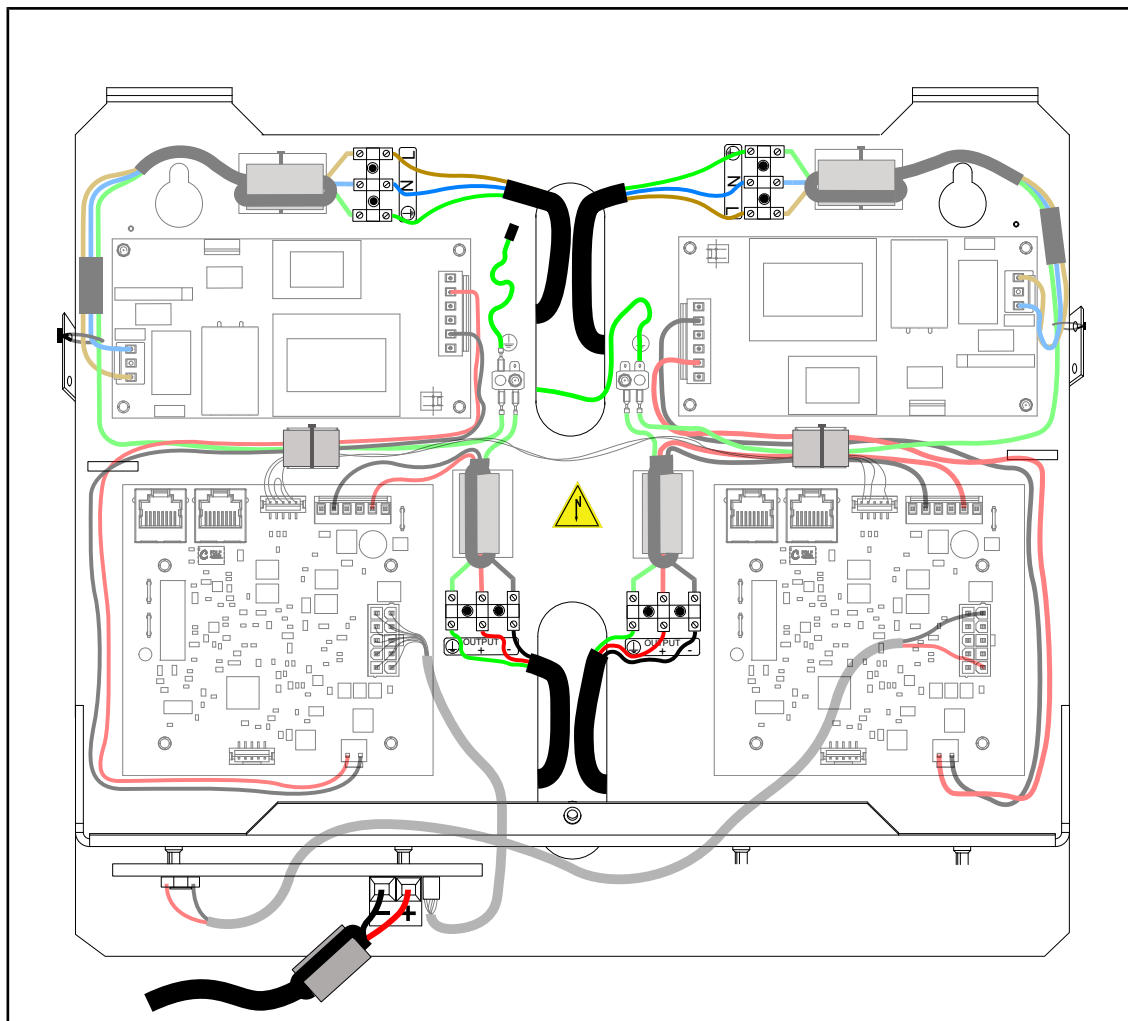


Fig. 7: Connecting the dual EPS power supply with Maquet backup

Connecting the dual EPS power supply with customer backup

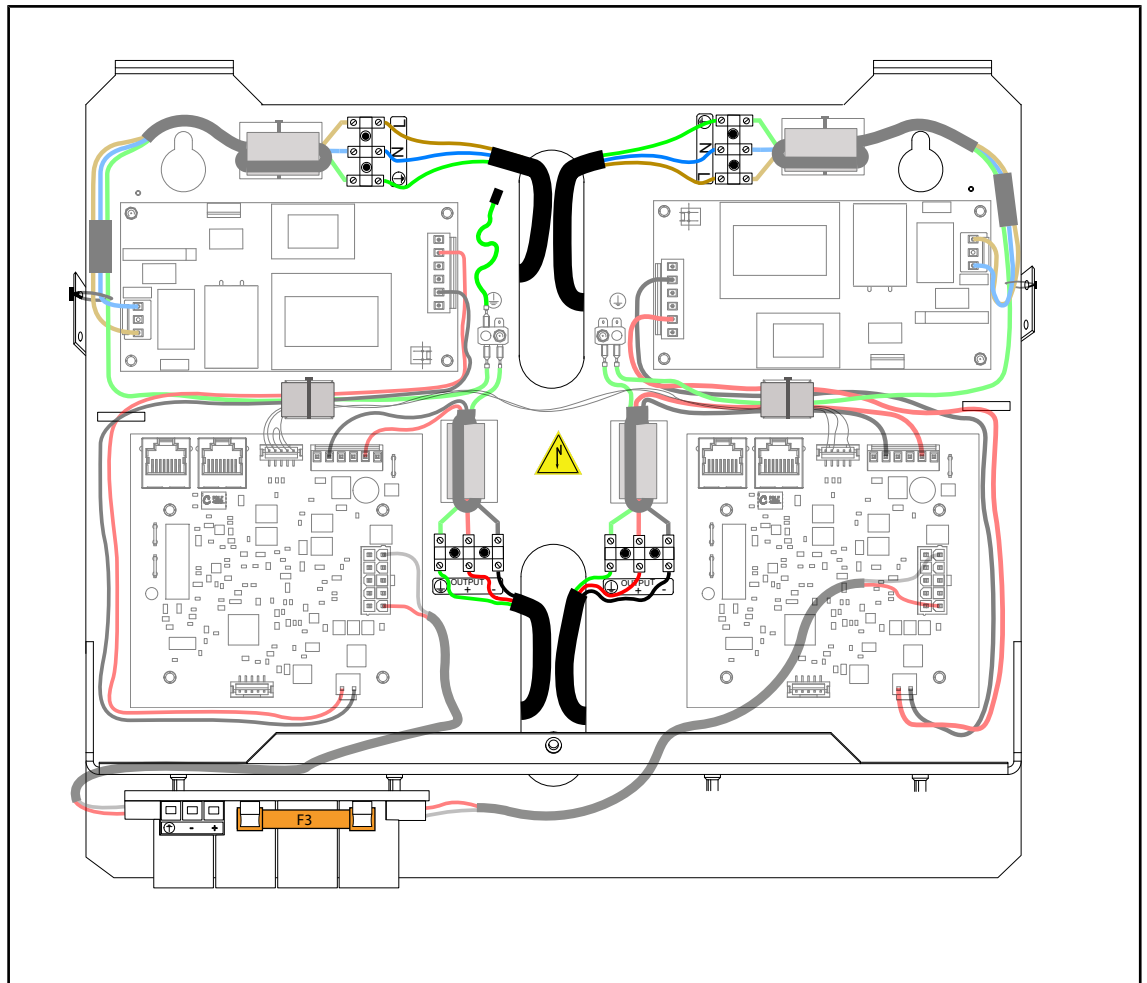


Fig. 8: Connecting the dual EPS power supply with customer backup

3 Technical specifications

EPS power supply connection diagrams

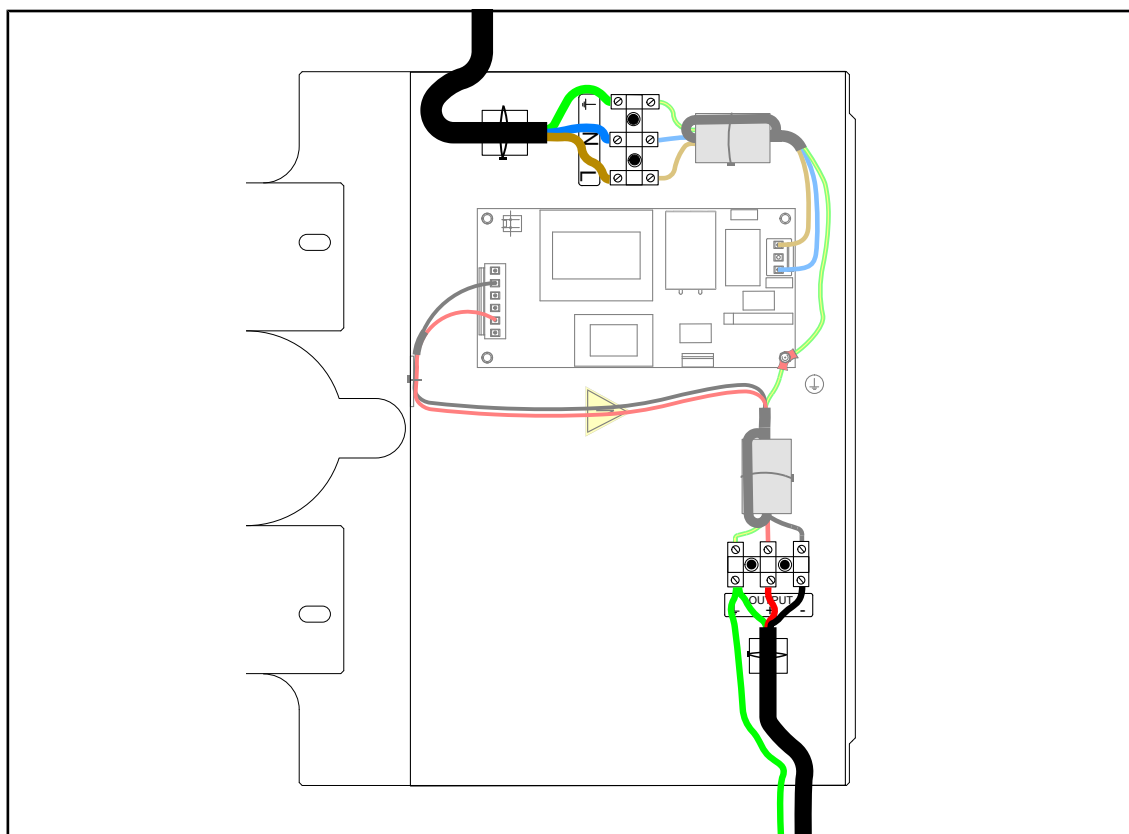


Fig. 9: Connecting the ceiling-mounted EPS

Connecting the dual-channel EPS power supply ceiling-mounted enclosure manufactured before December 2017

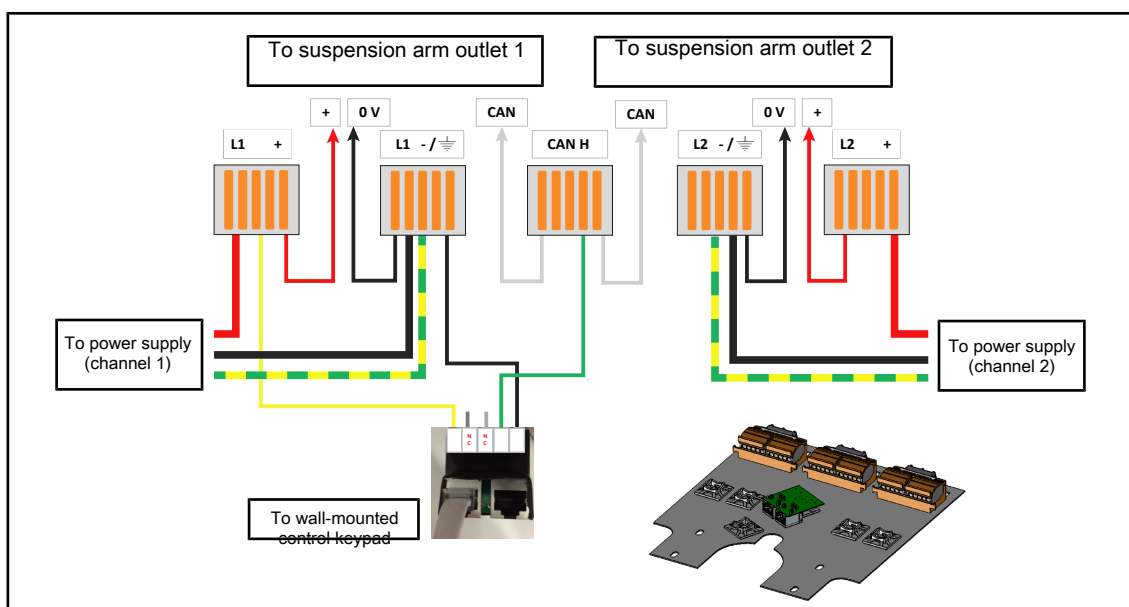


Fig. 10: Connecting the EPS power supply ceiling-mounted enclosure manufactured before December 2017

3.3 WPS power supply connection diagrams

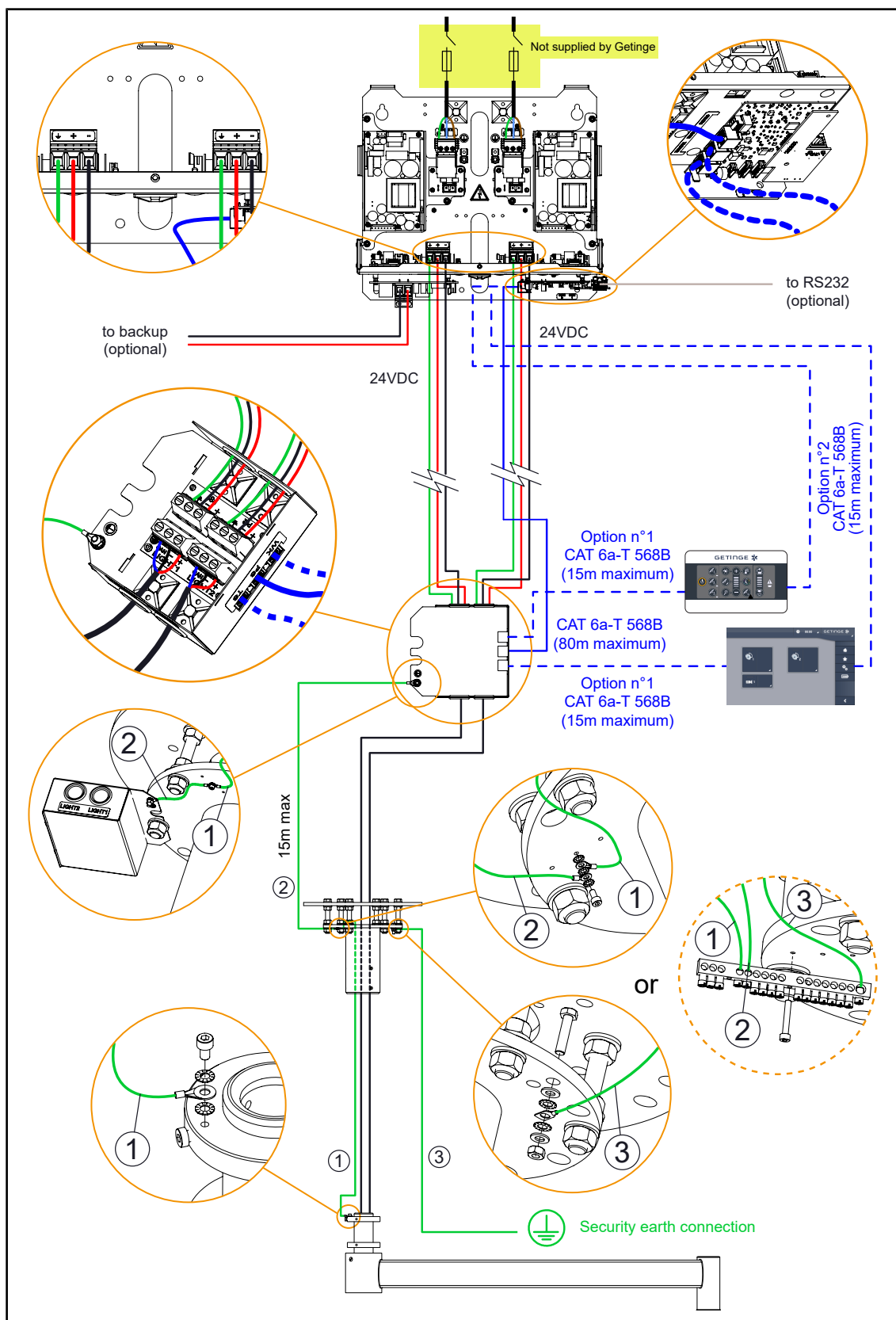


Fig. 11: Overall electrical connection diagram

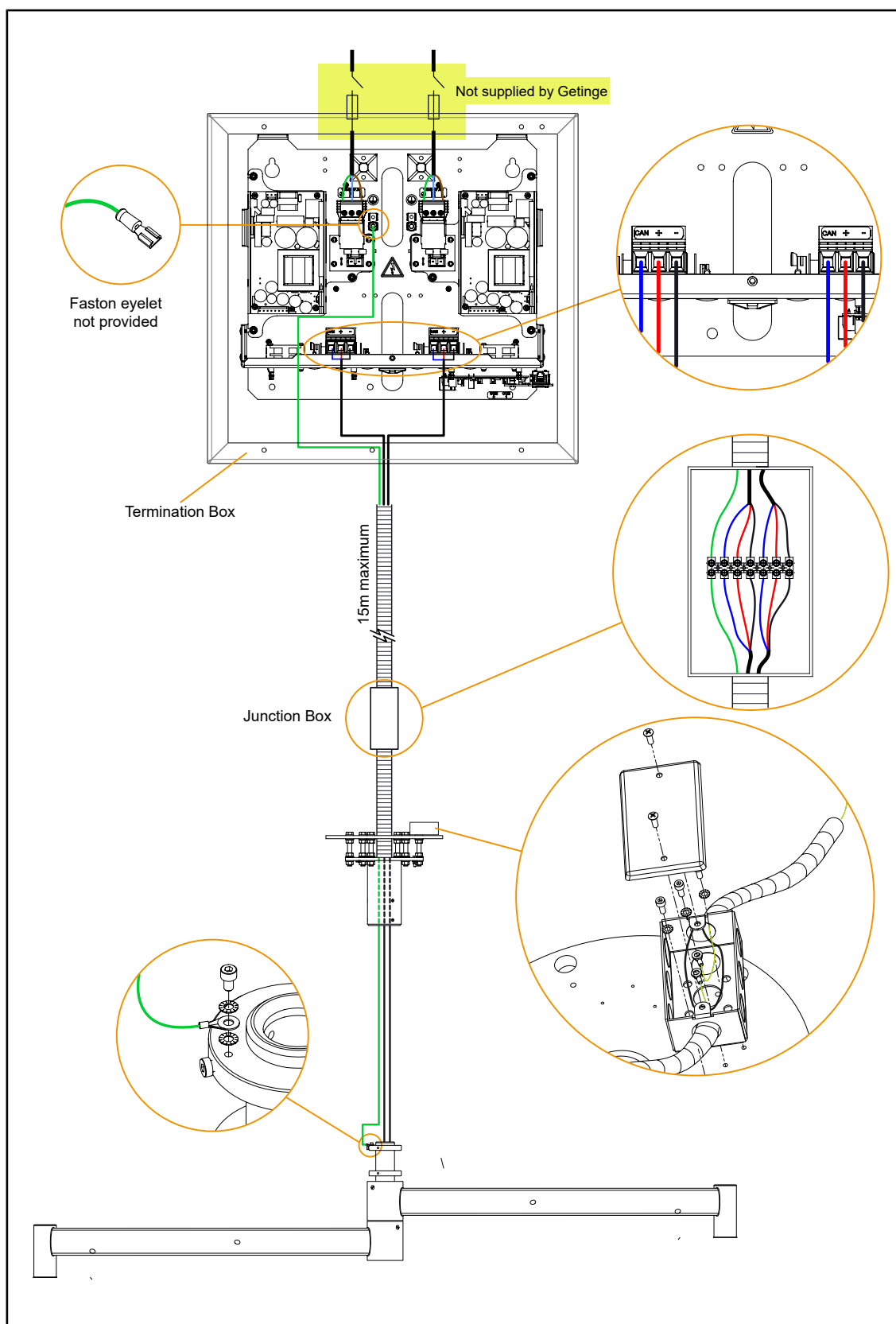


Fig. 12: Electrical connection diagram for U power supply with termination box

For each way, make the following electrical connections :

Voltage input 24V AC/DC :

L : Phase if 24AC or +24 if 24V DC

N : Neutral if 24AC or -24 if 24V DC

⏏ : Earth

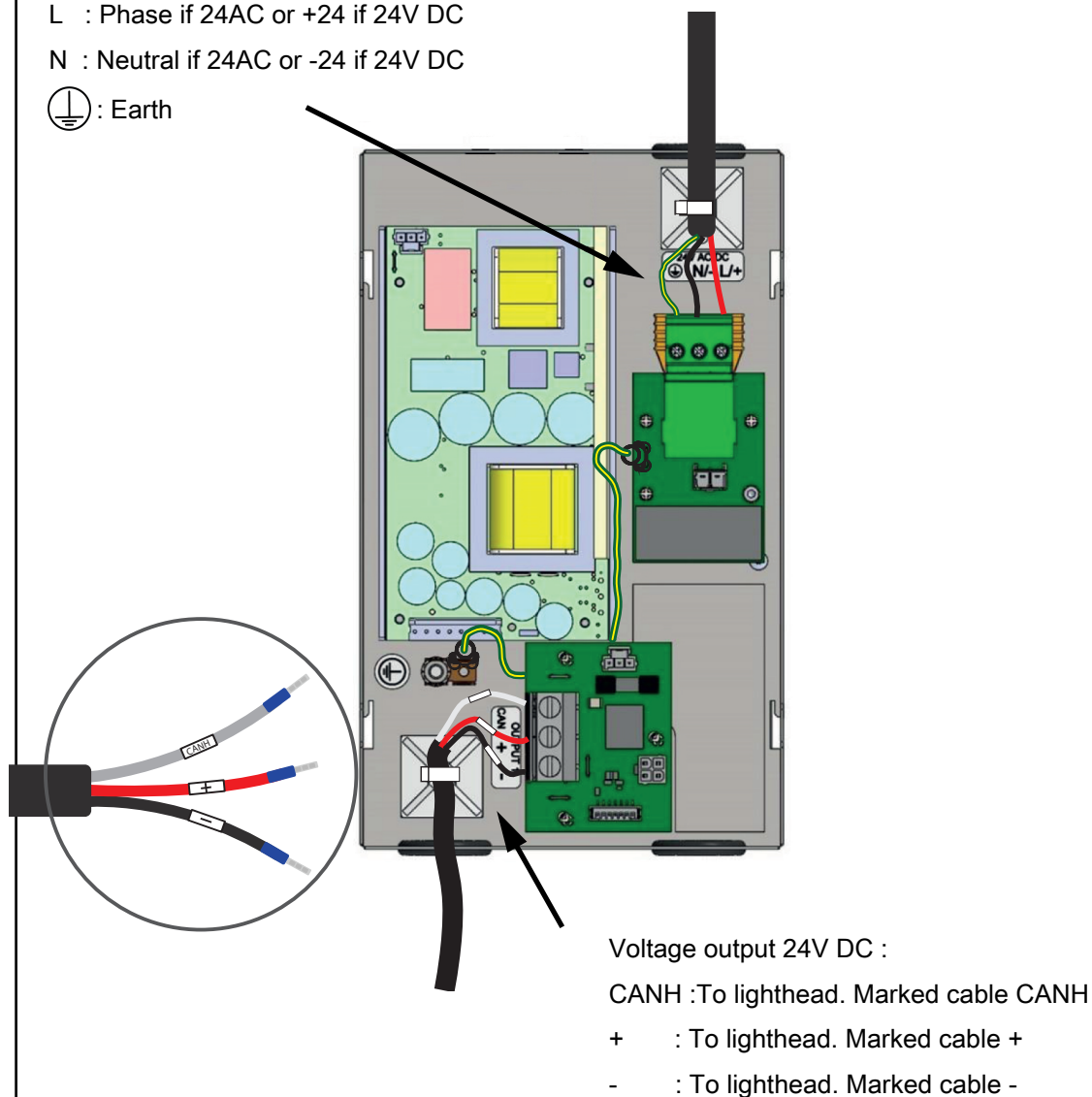


Fig. 13: 24V AC-DC / 24V DC version without remote control

4 Maintenance procedures

4.1 Tools required for maintenance




NOTICE

After-sales service kits are available on the LinkOne spare parts platform.

The LinkOne platform is accessible on the GetingeOnline portal:

<https://swp-linkone.getingegroup.local/>

Reference	Description
ARD572034999	OPM 039 - LUXMETER + SENSOR
ARD572059999	OPM 051 - METRIX MX MULTIMETER (54-59HD)
N/A	- IEC 62353-compatible electrical insulation and continuity tester -
N/A	2-10 Nm torque wrench 10-50 Nm torque wrench 40-200 N.m torque wrench
ARD687000011	 OPM 085 - INSULATED ANGLED PLIERS
N/A	Set of Allen keys
N/A	Set of Torx wrenches
N/A	Set of open-end wrenches
N/A	Set of flat-bladed screwdrivers
N/A	Set of Philips screwdrivers
N/A	Adjustment rod for OASYS arm
ARD659000011	Grease in can
ARD659000016	Aerosol grease
ARD368904555	VA - TUBE OF GREASE, 5 ML

4.2 Periodic maintenance

4.2.1 Periodic replacement cycles

To ensure safety and performance, please follow the recommendations below.

For SB, SA and SAT suspensions

Items	Frequency
All brakes	Every year
Suspension mounting screws (tighten the screws to the recommended tightening torque)	Every 6 years

Items	Frequency
Adapter mounting screws (tighten the screws to the recommended tightening torque)	Every 6 years
Acrobat 2000 or Ondaspace Spring arm safety segments	Every 6 years
Bushing mounting screws (tighten the screws to the recommended tightening torque)	Every 6 years
Batteries	Every 3 years

For SAX and SATX suspensions

Items	Frequency
All brakes	Every year
Suspension mounting screws (tighten the screws to the recommended tightening torque)	Every 10 years
Adapter mounting screws (tighten the screws to the recommended tightening torque)	Every 10 years
Valia Spring arm safety segments	Every 10 years
Oasys Spring arm safety segments	Every 10 years
Bushing mounting screws (tighten the screws to the recommended tightening torque)	Every 10 years
Batteries	Every 3 years

4.2.2 Replacing the batteries



WARNING!

Risk of burns

If unsuitable batteries are used, they may explode due to the emission of gases or liquids.

Always use batteries supplied by Getinge during installation and when replacing defective batteries.



WARNING!

Risk of electric shock or injury

The use of screws or spare parts other than those supplied by the manufacturer may damage the device.

Use only screws and spare parts supplied by the manufacturer.

**WARNING!**

Risk of burns

A metal object falling onto the two poles of the battery simultaneously risks short-circuiting the battery.

Handle the batteries with care to avoid causing a short circuit.

**WARNING!**

Risk of burns

Improper storage of batteries after removal may trigger a fire.

The terminals of used batteries must be insulated.

4.2.2.1

On the VPS power supply

**WARNING!**

Risk of electric shock

The product on which the technician is to work may still be connected to a power source.

Before performing any maintenance, turn off the device and lock out the electrical supply.

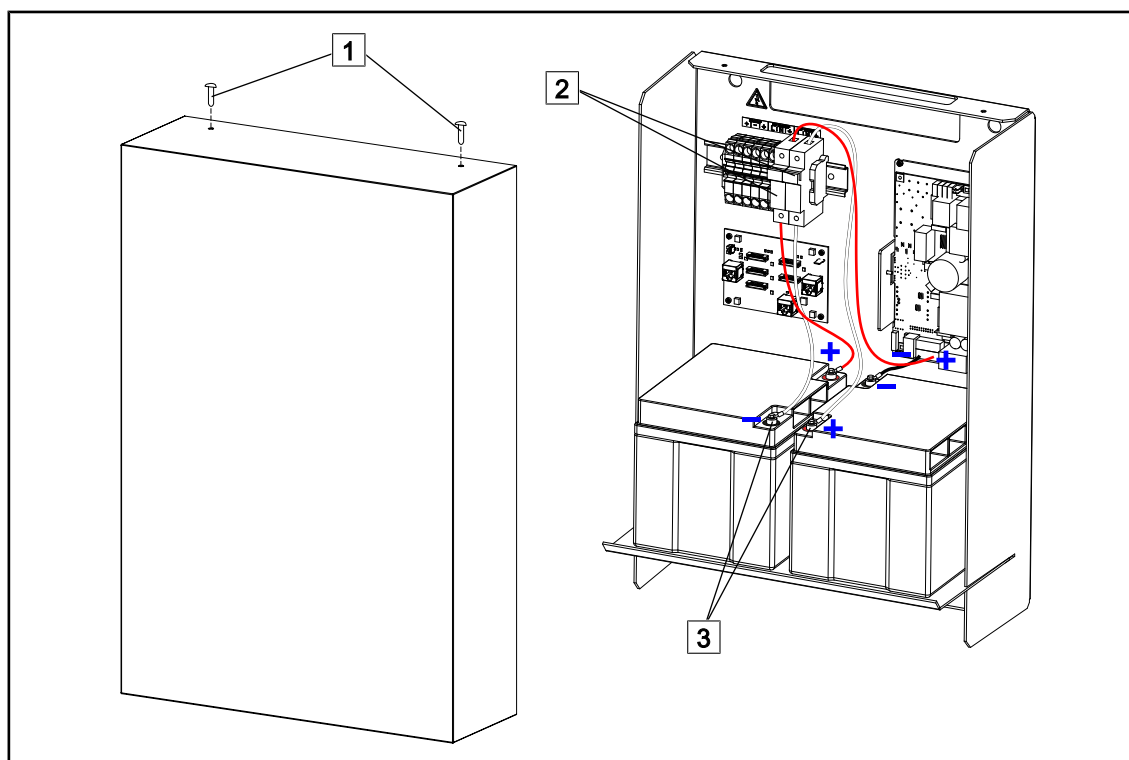


Fig. 14: Replacement of VPS power supply batteries

- Switch off the power supply.
- Open the battery pack cover by removing the mounting screws **1**.
- Open the fuse holders **2**.
- Unscrew the nuts and remove the lugs from the four battery terminals **3**.
- Replace the two batteries.

- Reconnect the cables to the terminals in compliance with the position shown in the illustration.
- Close the fuse holders [2].
- Close the battery pack cover and screw in the mounting screws [1].

4.2.2.2 On the EPS power supply



WARNING!

Risk of electric shock

The product on which the technician is to work may still be connected to a power source.

Before performing any maintenance, turn off the device and lock out the electrical supply.



NOTICE

For a **one-hour** battery backup, you will find 2 pairs of red and black wires.

For a **three-hour** battery backup, you will find 4 pairs of red and black wires.

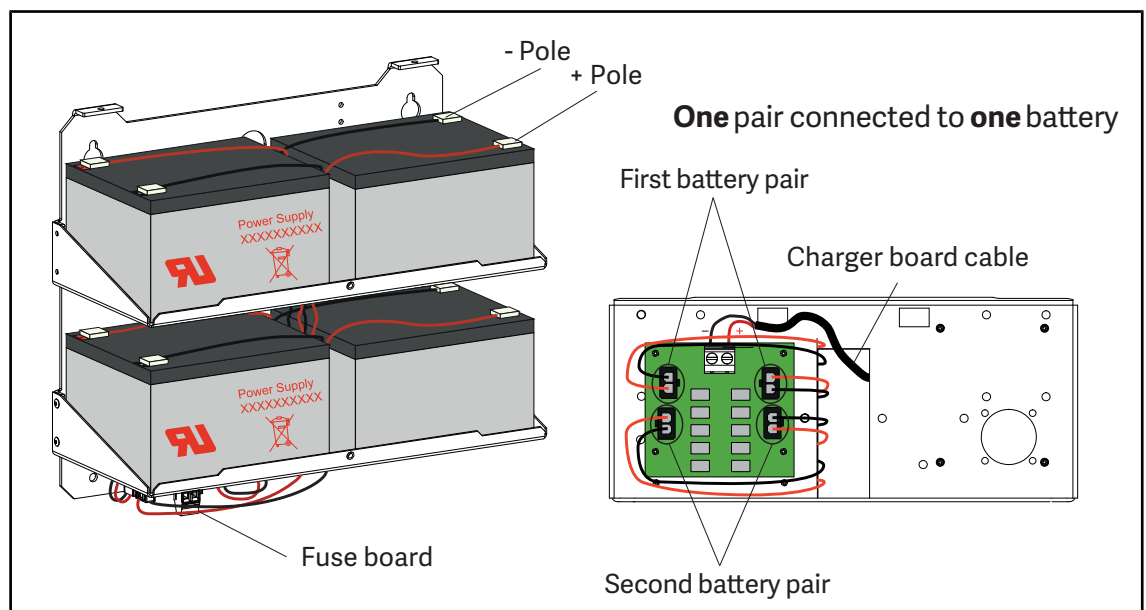


Fig. 15: Replacing the EPS power supply batteries

- Switch off the power supply.
- Unplug the connectors from the fuse board.
- Remove the lugs from the battery terminals
- Replace the batteries.
- Reconnect the lugs on the battery terminals.
 - Each battery has a positive and a negative **terminal**, marked **red and black, respectively**.
 - Each cable pair must be connected to the terminals by matching colours.
 - The **red terminal** is on the “+” side of the battery and connects to the red wire.
 - The **black terminal** is on the “-” side of the battery and connects to the black wire.
- Reconnect the connectors of the fuse board.

4.2.2.3 On the WPS power supply

**WARNING!**

Risk of electric shock

The product on which the technician is to work may still be connected to a power source.

Before performing any maintenance, turn off the device and lock out the electrical supply.

**NOTICE**

For a **one-hour** battery backup, you will find 2 pairs of red and black wires.

For a **three-hour** battery backup, you will find **4 pairs of red and black wires**.

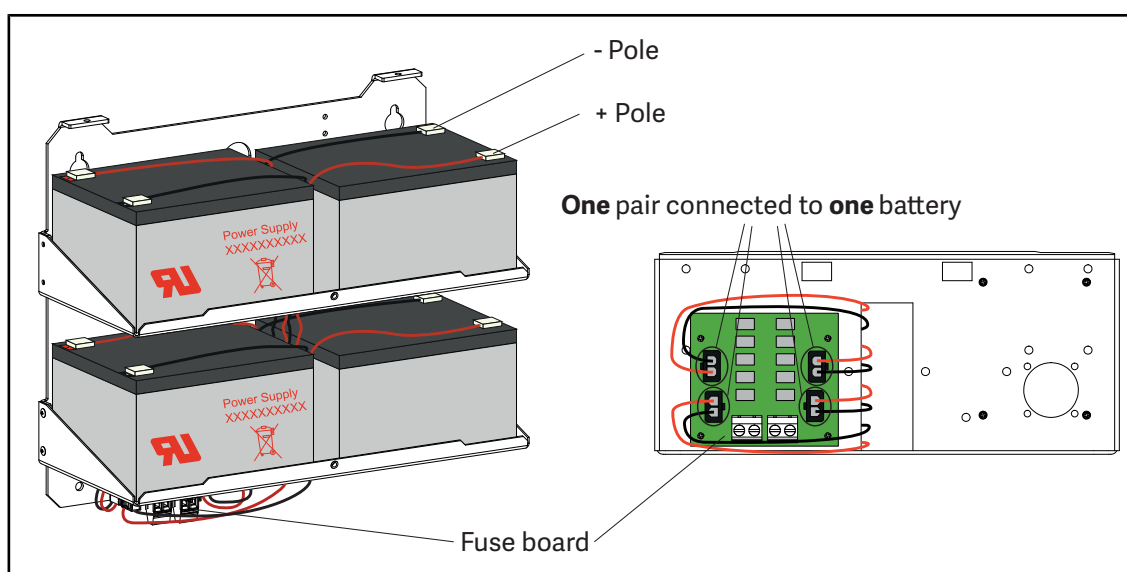


Fig. 16: Replacing the WPS power supply batteries

- Switch off the power supply.
- Unplug the connectors from the fuse board.
- Remove the lugs from the battery terminals
- Replace the batteries.
- Reconnect the lugs on the battery terminals.
 - Each battery has a positive and a negative **terminal**, marked **red and black, respectively**.
 - Each cable pair must be connected to the terminals by matching colours.
 - The **red terminal** is on the “+” side of the battery and connects to the red wire.
 - The **black terminal** is on the “-” side of the battery and connects to the black wire.
- Reconnect the connectors of the fuse board.

4.3 Operations to be performed on the touchscreen

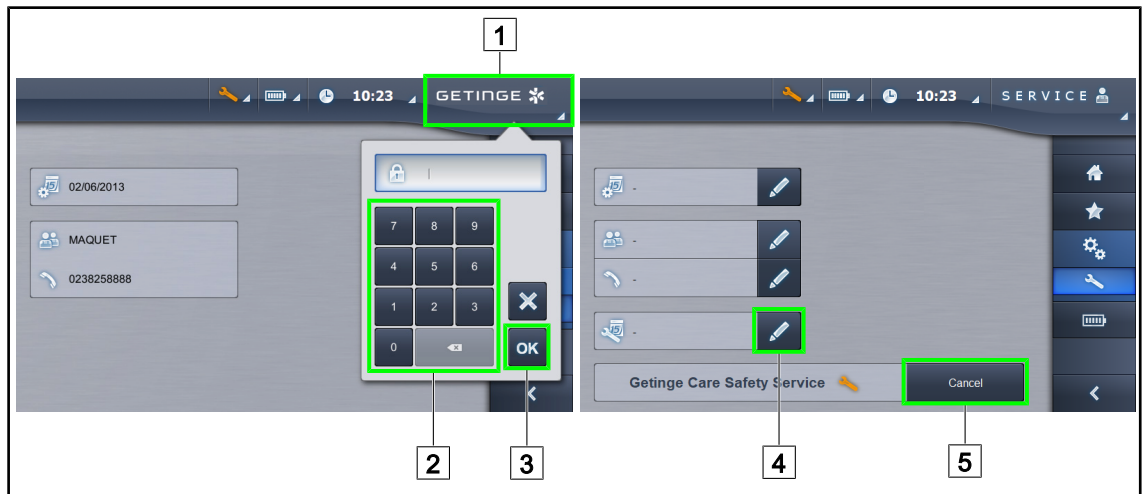


Fig. 17: Entry of maintenance date

- At the end of the maintenance, enter the date of maintenance in the touchscreen menu.
- Press the **Getinge logo** [1] twice to display the password entry window.
- Enter the password **8311** on the keyboard [2] then press OK [3].
- On the maintenance page, press **Maintenance Date** [4] then enter the date of the maintenance performed.
- Press Cancel [5] to reinitialise the maintenance and remove the orange key.
- Quit the menu by pressing the **Getinge logo** [1] again.

5 Adjustments



NOTICE

Ensure that the weight of the lighthead is the same whether being raised or lowered and that it is stable in any position.

5.1 Lubrication

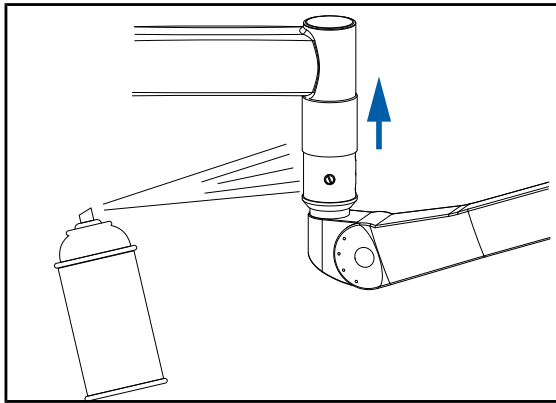


Fig. 18: Suspension lubrication

Lubricating the suspension under the safety ring

1. Remove the mounting screw and lift the safety ring.
2. Spray lubricating grease at the location of the safety ring.
3. Lower the safety ring and refit the mounting screw.

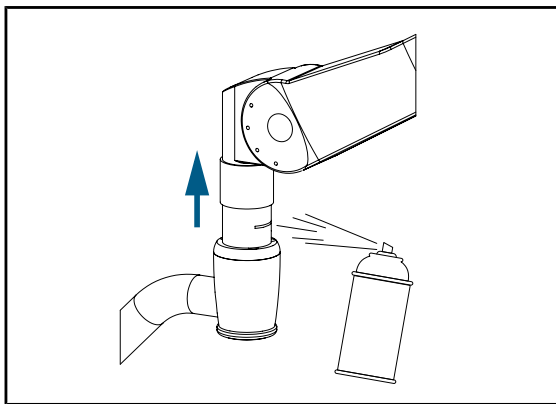


Fig. 19: Spring-arm lubrication

Lubricating the spring arm under the safety ring

1. Remove the mounting screw and lift the safety ring.
2. Spray lubricating grease at the location of the safety ring.
3. Lower the safety ring and refit the mounting screw.

5.2 Adjusting the Acrobat 2000 and Ondaspace spring arms

Adjusting the balance of the SF/DF spring arms

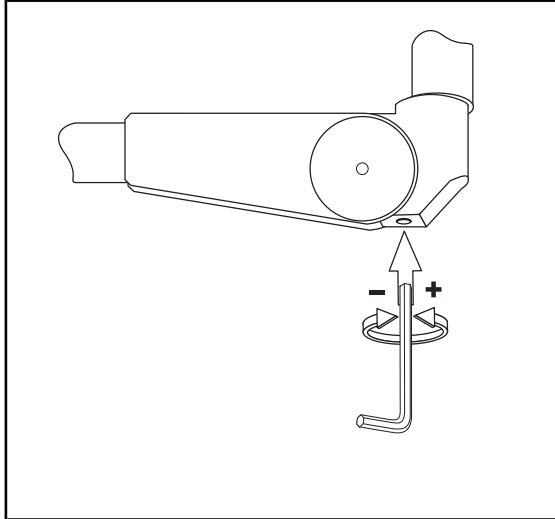


Fig. 20: Adjusting the balance

- For the ONDASPACE range, unscrew the protective cap.
- Insert a 5-mm Allen key in the opening.
- Raise the spring arm higher than the horizontal position.
- If the lighthead goes down: unscrew (turn towards the "+") to increase the force of the spring arm.
- If the lighthead goes up, Turn screw (turn towards the "-") to decrease the force of the spring arm.
- For the ONDASPACE range, screw in the protective cap.

Adjusting the top stop on the DF spring arm

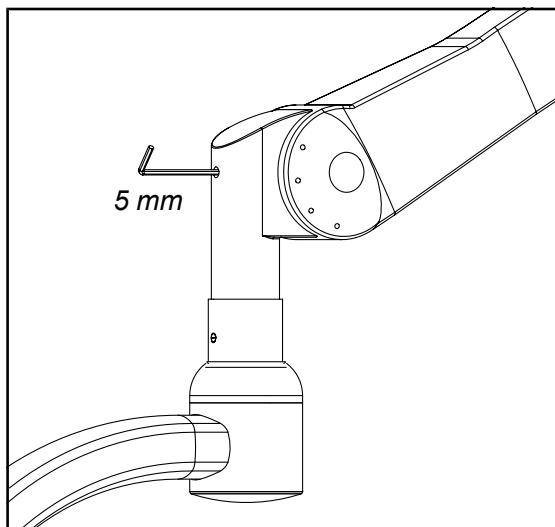


Fig. 21: Stop adjustments

- For the Acrobat 2000 range:
- Tighten to lower the stop.
- Loosen to raise the stop.

Adjusting the top stop (SF spring arm)

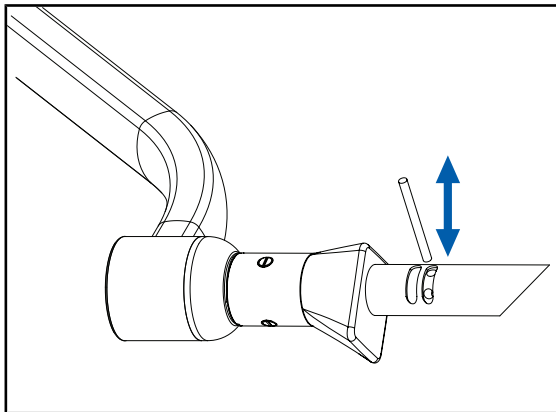


Fig. 22: Ring motion

- Raise the ring using the adjustment rod to lower the stop.
- Lower the ring using the adjustment rod to raise the stop.

5.3 Adjusting the Oasys spring arms

Removing the SF/DF side covers

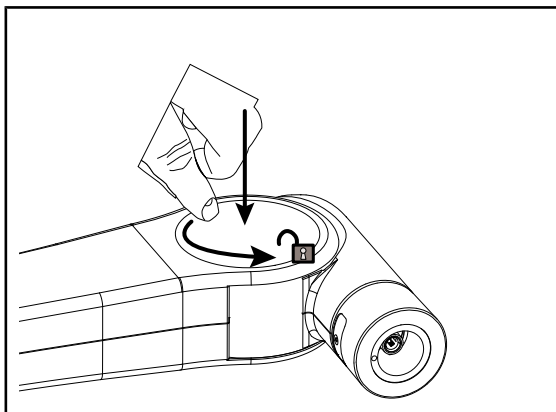


Fig. 23: Removing the round covers

- Remove the round covers, two for the SF version or four for the DF version.
- Press the cover slightly, then turn anti-clockwise until you hear an unlocking "click".
- Remove the top cover.

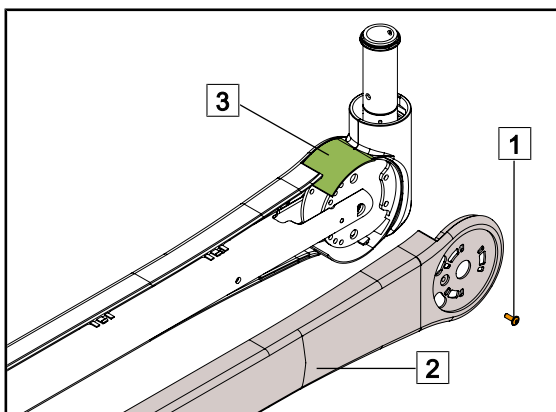


Fig. 24: Removing the spring-arm half-covers

- Using a 2.5-mm Allen key, remove the two mounting screws [1] for the SF version, or the four mounting screws for the DF version.
- Unclip the two half-covers [2].



NOTICE

Be careful not to damage the plastic half-rings [3] when removing the covers.

- Move the half-rings [3] away and leave them on their base.

Adjusting the tension in the SF/DF spring arm

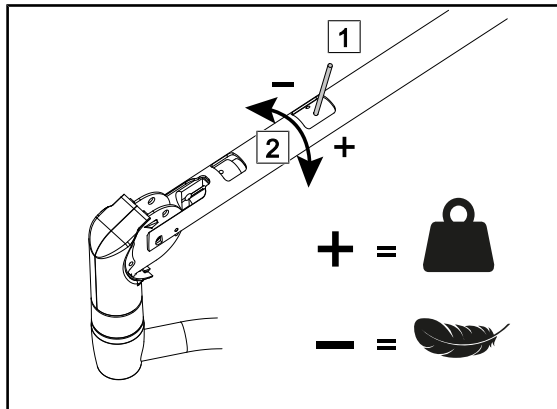


Fig. 25: Adjusting the tension

- Insert the metal rod supplied with the spring arm into the side-hole nut **1**.
- If the spring arm tends to move down, the spring arm tension is insufficient.
 - Rotate the nut so as to increase the tension.
- If the spring arm tends to move up, the spring arm tension is excessive.
 - Rotate the nut so as to decrease the tension.

Adjusting the alignment of the spring arm (DF version)

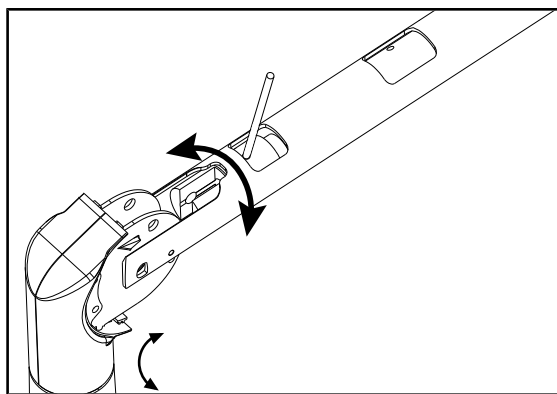


Fig. 26: Alignment

The tilt angle of the spring arm on the light-head side can be adjusted.

- The tension adjustment is carried out using the metal rod supplied with the spring arm.
- Insert the tool into the side-hole nut.
- Rotate the nut counter-clockwise to retract the end of the spring arm, and clockwise to extend it.

Adjusting the spring arm vertical stops

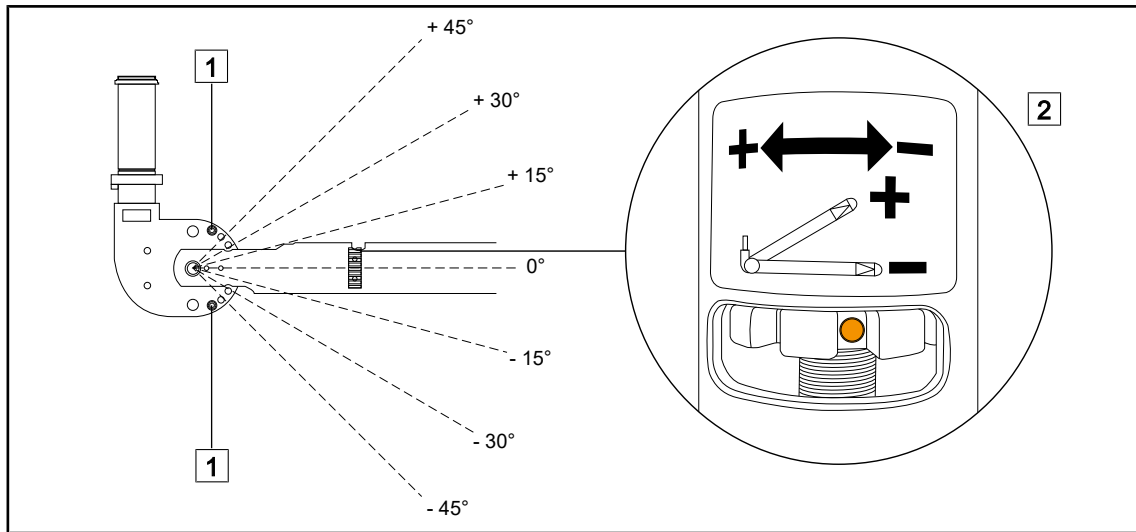


Fig. 27: Adjusting the vertical stops

- Locate the four vertical stop screws **1**
- Determine the desired angle for the stops. The angle settings are as follows: 0°, 15°, 30°, and 45° above, or below, the horizontal position of the spring arm.
- Using a 5-mm Allen wrench, unscrew the vertical stop screws on both sides to position them in the two holes of the selected angle ranges:
 - from 0° to 30°: tighten each screw so that the base of the screw head abuts against the spring arm without play.
 - for angles +45° and -45°: remove the four screws.
- The desired amplitude can be fine-tuned using the adjustment wheel **2**.

Fitting the spring arm covers

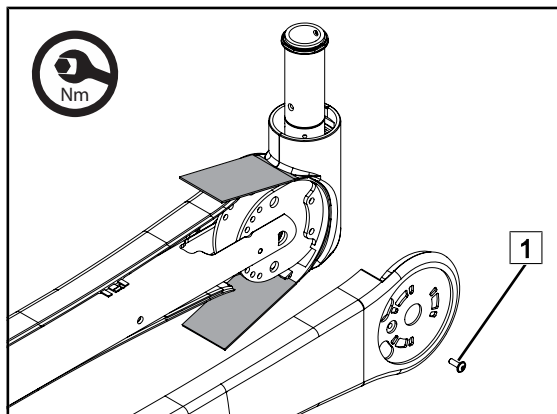


Fig. 28: Refitting the half-covers

- Do not insert the half-rings into the covers.
 - Leave them outside.
- Carefully refit and clip the half-covers to the spring arm.
- Refit the mounting screws.
 - Two screws for SF version **1** to a torque of **1 N.m (0.73 lb.ft)**
 - Four screws for DF version **1** to a torque of **1 N.m (0.73 lb.ft)**

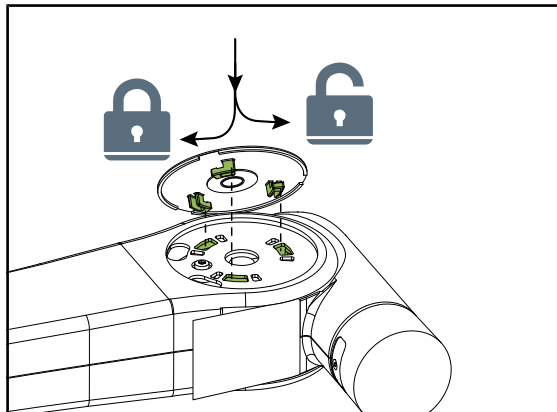


Fig. 29: Fitting the round covers

- Position the round cover so that the three tabs are facing the oblong holes in the side covers.
- Press the cover slightly, then turn clockwise until you hear a locking “click”.
- **Checking that the round covers are secure**

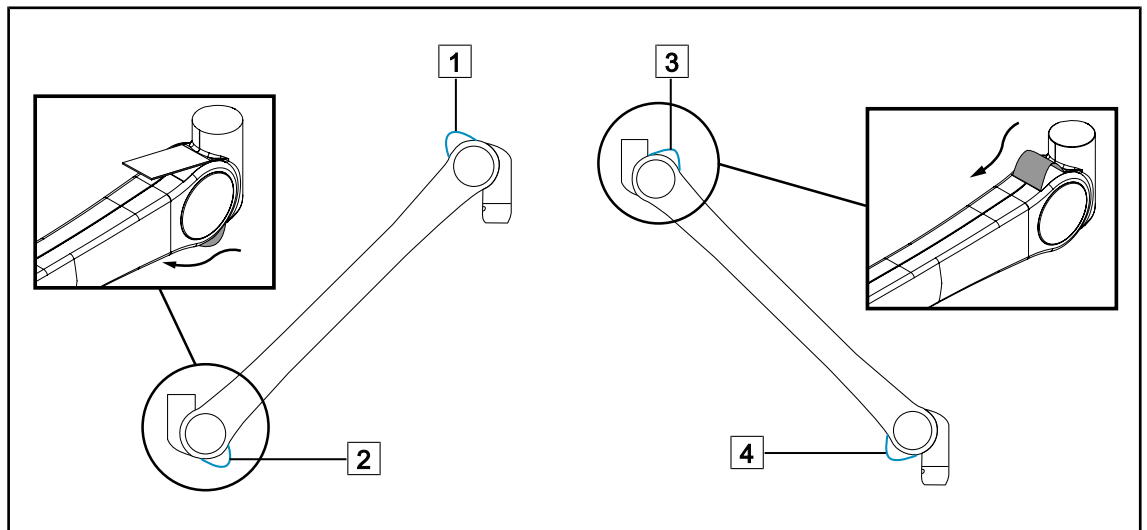


Fig. 30: Mounting the half-rings

- Position the spring arm in the raised position.
- Insert the half-rings **1** and **2** in the side covers, according to the spring arm position.
- Position the spring arm in the lowered position.
- Insert the half-rings **3** and **4** in the side covers, according to the spring arm position.
- Check that the half-rings slide correctly in the side covers.

5.4 Adjusting the Valia spring arms

SF version

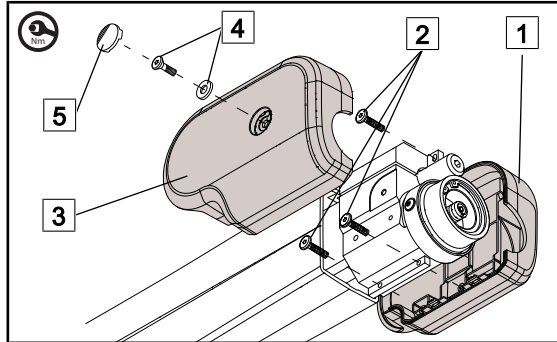


Fig. 31: Removing the front flanges

- Remove the screw cover [5].
- Remove the washer with the M4x10 screw [4].
- Remove the flange [3].
- Unscrew the three PT M3x12 screws [2] then remove the flange [1].

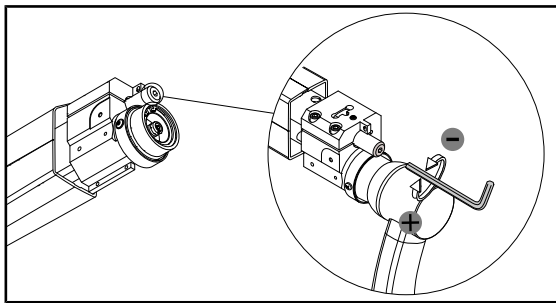


Fig. 32: Top stop adjustment

- Insert a 5-mm Allen key.
- Tighten to raise the stop to + 20 degrees.
- Tighten to lower the stop to 0 degrees.



NOTICE

TIP: To make the adjustment easier, pull the arm slightly downwards to release the adjustment screw

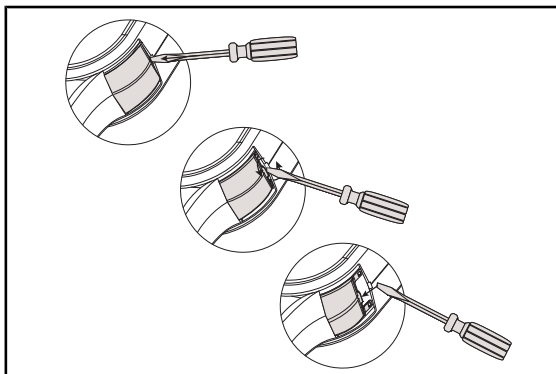


Fig. 33: Opening the tabs

- Insert a flat head screwdriver into the cover notch and tab.
- Rotate to release the stop from the tab.
- Push the tab back.

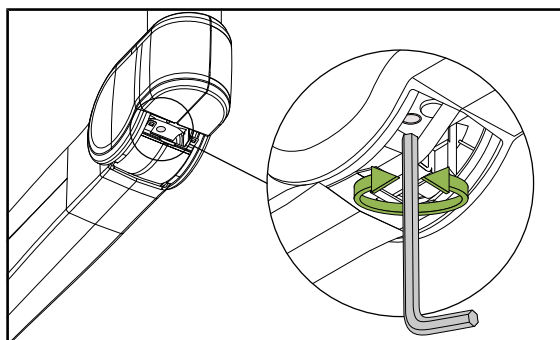


Fig. 34: Adjusting the tension

- Position horizontally and push back the tab halfway to access the adjustment screw.
- Insert a 5-mm Allen key.
- Tighten to decrease the tension.
- Loosen to increase the tension.



WARNING!

Risk of injury

If a spring arm safety segment is missing or installed incorrectly, a component or part may fall from the device.

Check that all spring arm safety segments are properly installed.

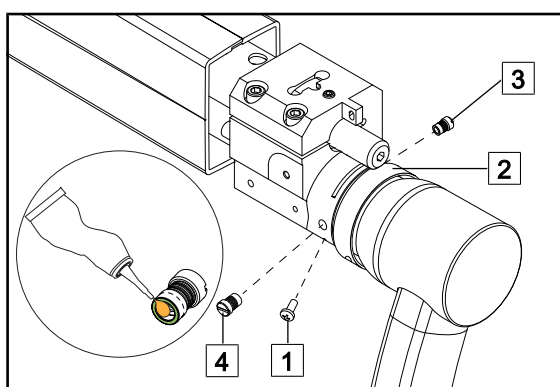


Fig. 35: Adjusting the spring arm brakes

- Remove the M4x10 screw [1] and insert the safety ring [2].
- Remove the brake screw [3], for the LCH 17 spring arm, or both brake screws [3] and [4], for the LCH 19 spring arm.
- Place a drop of paste, supplied with the spring arm, on the wear area of the brake screws.
- Adjust the brake screw [3], for the LCH 17 spring arm, or both brake screws [3] and [4], for the LCH 19 spring arm.
- Check that the Spring arm safety segments.
- Slide the safety ring [2] back in position then refit the M4x10 screw [1].

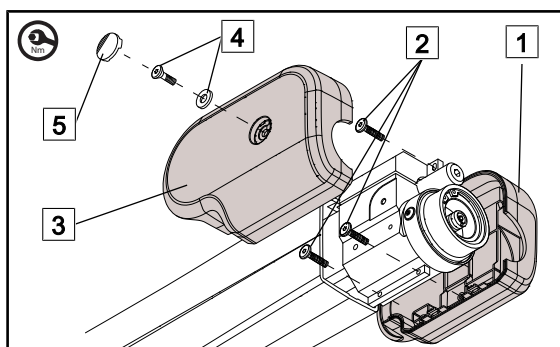


Fig. 36: Refitting the front flanges

- Fit the flange [1], then fit the three M3x12 PT screws [2] until they make contact.
- Fit the flange [3].
- Fit the washer with the M4x10 screw [4]; tighten to a torque of **1 N.m (0.73 lb.ft)**.
- Fit the screw cover [5].

DF version

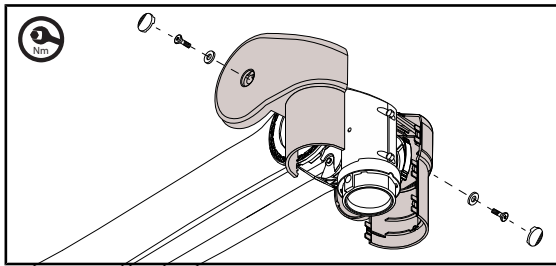


Fig. 37: Removing the front flanges

- Remove the screw covers.
- Unscrew the two M4x10 screws and remove the two washers.
- Unhook the two flanges.

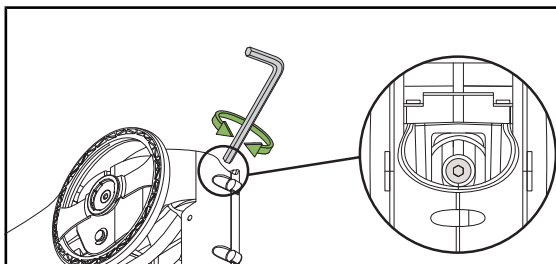


Fig. 38: Top stop adjustment

- Insert a 5-mm Allen key.
- Tighten to raise the stop.
- Loosen to lower the stop.

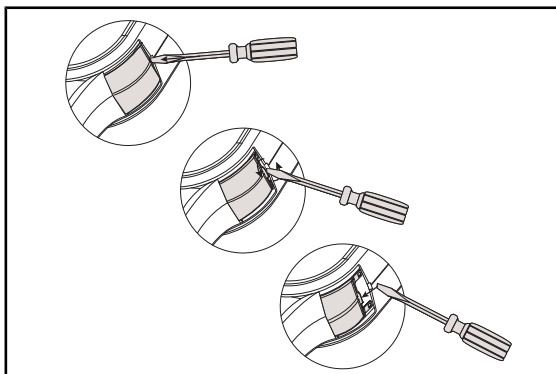


Fig. 39: Opening the tabs

- Insert a flat head screwdriver into the cover notch and tab.
- Rotate to release the stop from the tab.
- Push the tab back.

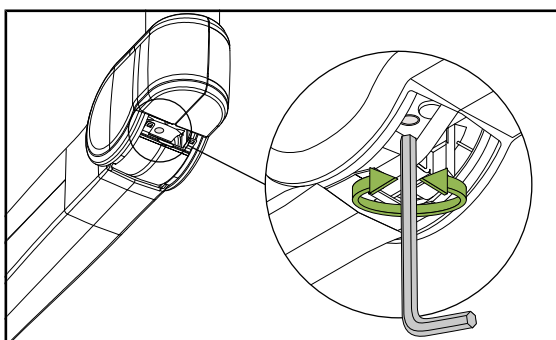


Fig. 40: Adjusting the tension

- Position horizontally and push back the tab halfway to access the adjustment screw.
- Insert a 5-mm Allen key.
- Tighten to decrease the tension.
- Loosen to increase the tension.

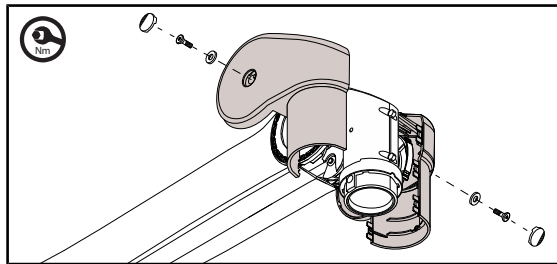


Fig. 41: Fitting the front flanges

- Clip on the two flanges.
- Fit the two washers with the two M4x10 screws, tighten to a torque of **1 N.m (0.73 lb.ft)**.
- Fit the screw covers.

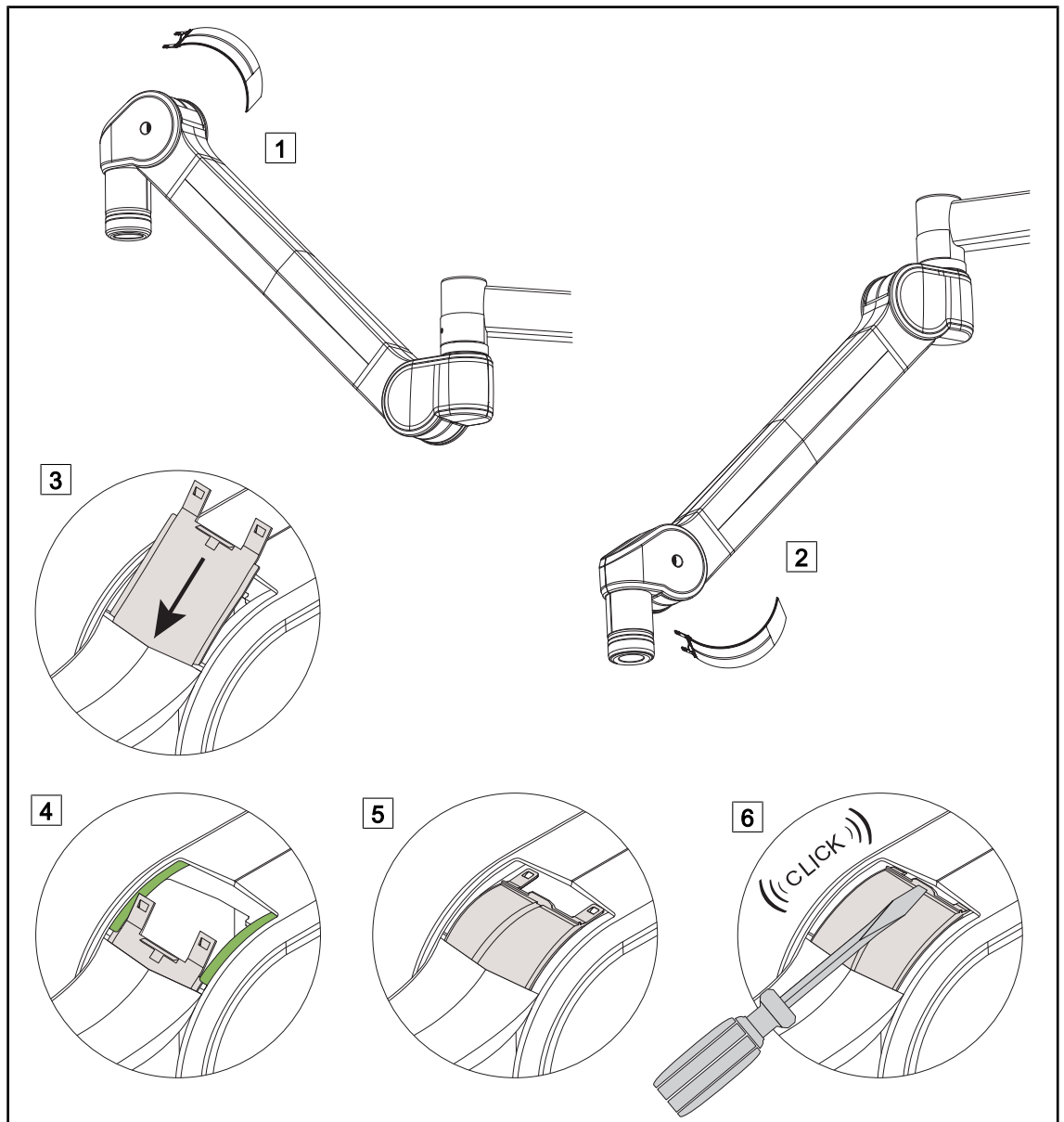


Fig. 42: Fitting the half-rings

- Check that the matt inner surface and shiny outer surface of the tabs are correctly positioned to ensure correct mounting in the grooves.
- Position the spring arm in the high position **1** to insert the first two tabs.
- Insert the tab in the grooves **3**.

- Raise the half-ring [4] back into its housing.
- Lock the half-ring by pushing it into its housing using a flat screwdriver, until it clicks [5].
- Position the spring arm in the low position [2], then proceed in the same way to install the second half-ring.
- Move the arm up and down to check that the tabs slide without coming out of their grooves.

5.5 Adjusting the brakes



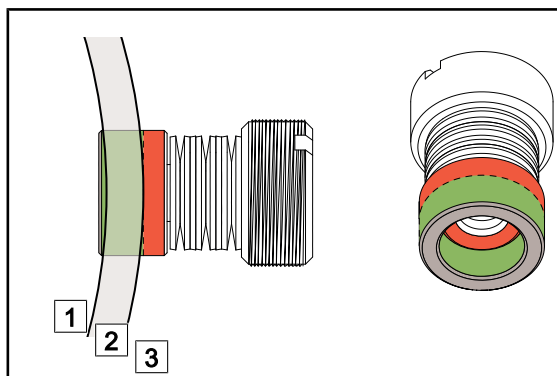
NOTICE

It is normal for a newly installed brake to require readjustment after two to six months of use in order to compensate for wear.



NOTICE

The adjustment of the lighthouse brakes must be carried out with a handle.



- Break-in zone [1]
- Useful zone [2]
- Wear zone [3]

Fig. 43: Brake wear

Suspension

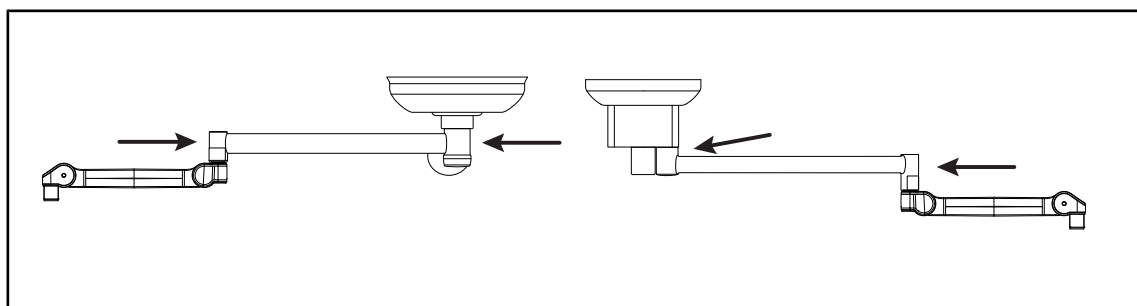


Fig. 44: Suspension brake adjustments

- Tighten screw to increase braking.
- Loosen screw to reduce braking.

VCSII lighthouse

DF version

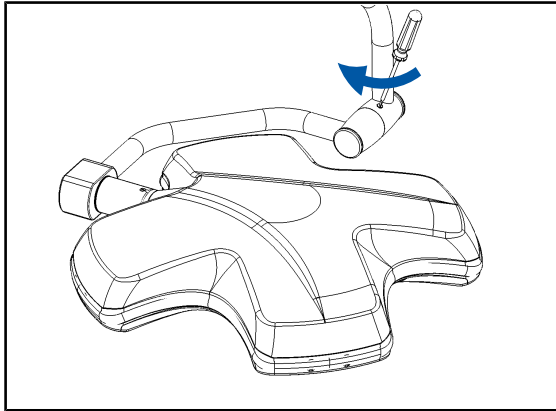


Fig. 45: Adjusting the DF lighthouse brake

- Adjust the lighthouse brake, located on the intermediate fork:
 - Tighten screw to increase braking.
 - Loosen screw to reduce braking.

SF version

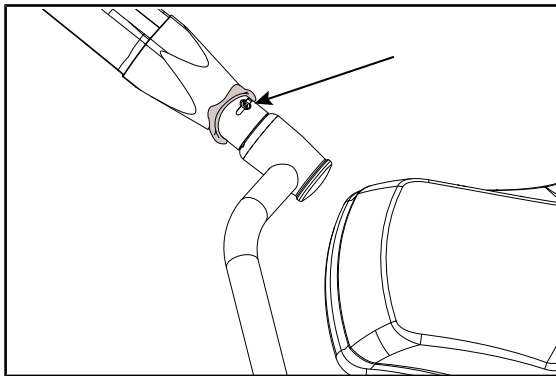


Fig. 46: Adjusting the SF lighthouse brake

- Adjust the brake on spring arm and main fork
 - Fold the silicone sleeve back towards the spring arm.
 - Tighten screw to increase braking
 - Loosen screw to reduce braking
 - Unfold the silicone sleeve while covering the end of the spring arm cover towards the lighthouse.



CAUTION!

Risk of equipment damage

If adjustments are made incorrectly or not at all, the lighthouse or installed equipment may drift.

Make all adjustments (balance, stop and brakes) during installation and then after all maintenance operations.

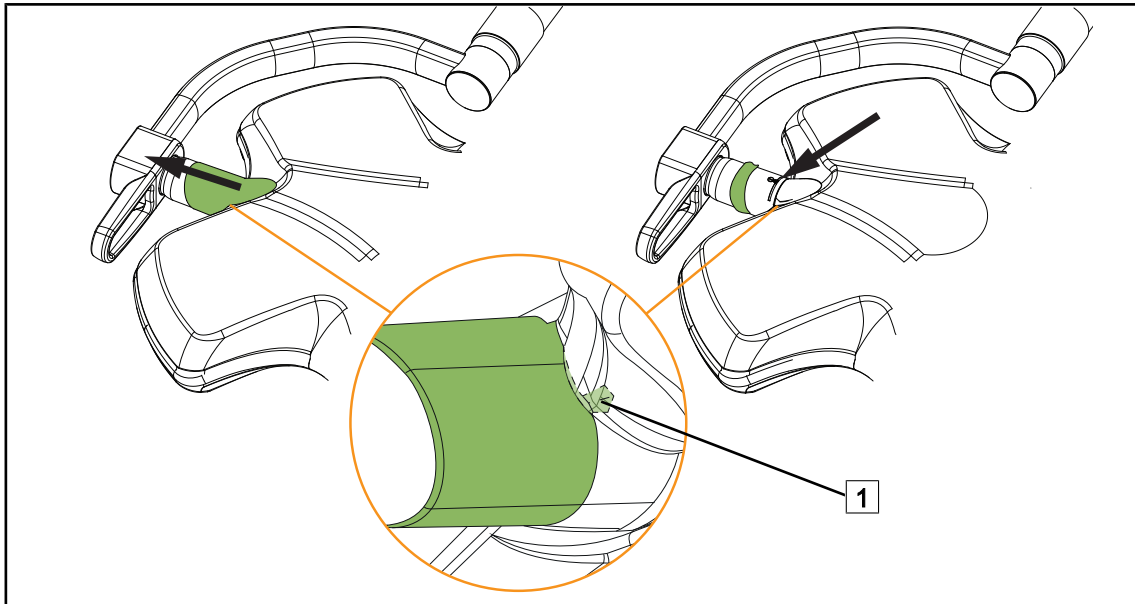
VSTII lighthead

Fig. 47: Adjusting the VSTII lighthead brake

- Slide the silicone sleeve to access the brake and spring arm safety segment.
- Check that the spring arm safety segment is correctly positioned and adjust the brake if necessary:
 - Tighten screw to increase braking.
 - Loosen screw to reduce braking.
- Reposition the silicone sleeve **1**.

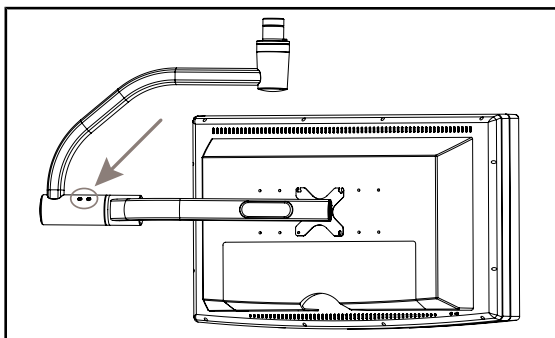
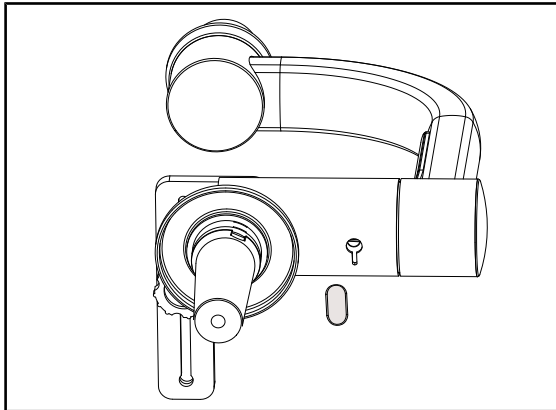
XHS0 monitor mount

Fig. 48: XHS0 monitor mount

- Adjust the two brake screws by screwing in to increase the braking, or by unscrewing to reduce the braking.

SC05 camera mount



- Remove the cap to uncover the brake screw.
- Adjust the brake tightness.
- Refit the cap.

Fig. 49: SC05 brake adjustment

6 Inspections

6.1 Mechanical inspections

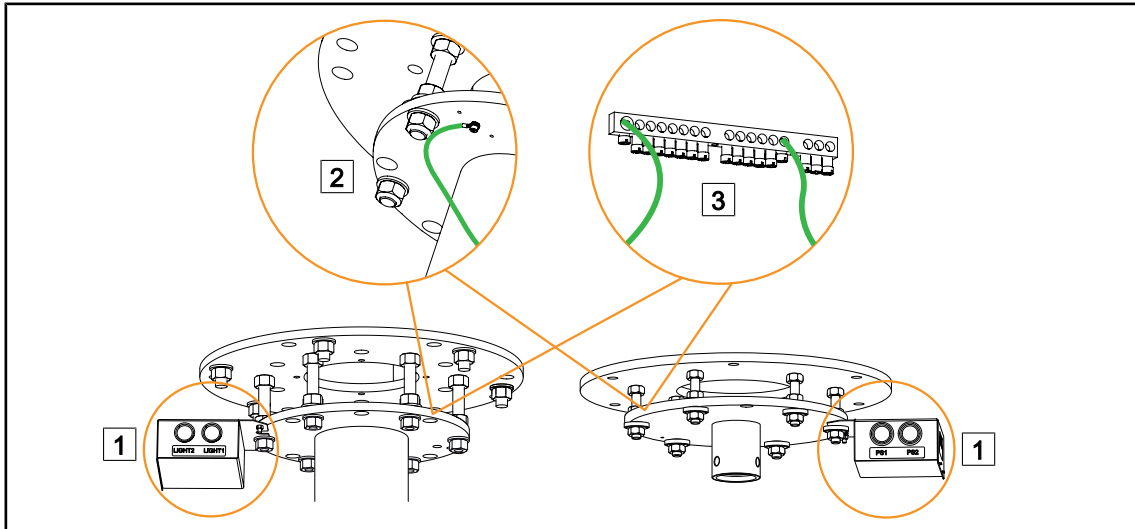


Fig. 50: Anchor point

- Check the tightening of the anchoring and connections on the terminals [2] [3] and the connection boxes [1].
- Check the ground connections [2] or [3].

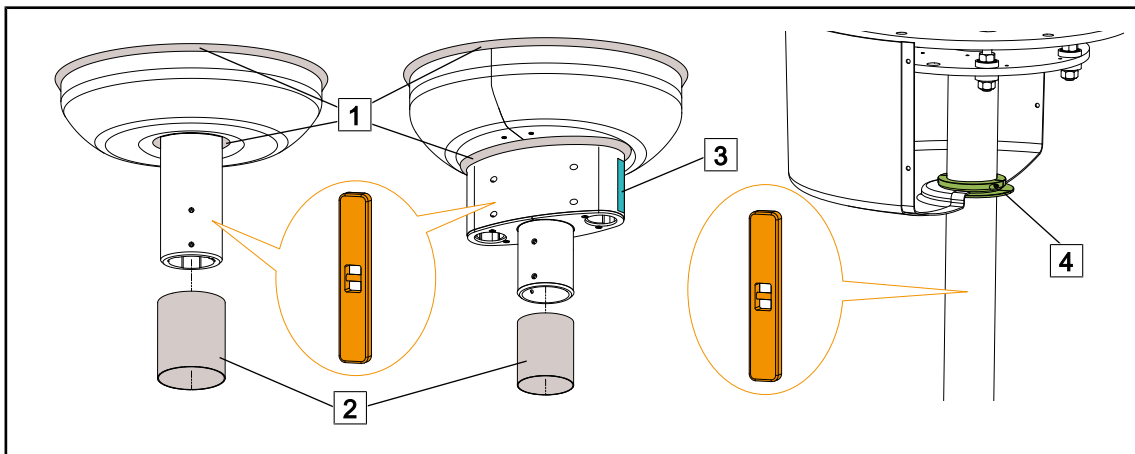


Fig. 51: Suspension tube and ceiling cover

- Check the rigidity of the suspension by shaking the assembly.
- Verify the verticality of the tube.
- SAT and SATX tube: Check the tightening of the screws of the half-plates on shafts 2 and 3.
- SB tube: Check the tightening of the cover split-rings [4].
- Check that the cover and the retention and upper seals [1] are secure.
- Check the resistance of the silicone sleeve [2] and, for the modified SAT tube, the screw cover labels [3] for shaft 2 and 3.

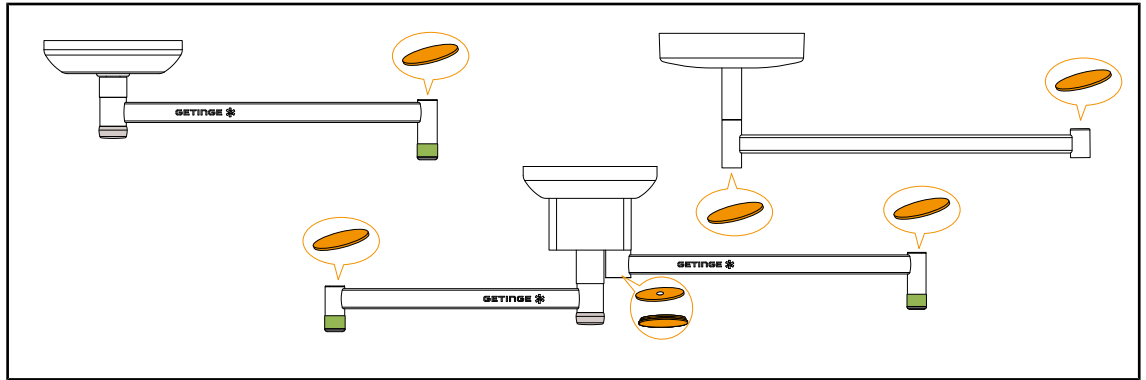
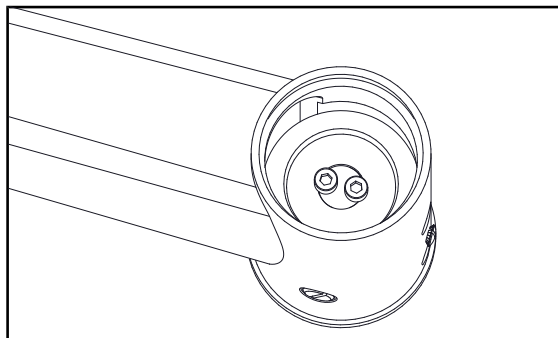


Fig. 52: Suspension arm

- Check the presence of the tube suspension's linking screws and the replacement periodicity. (Do not re-tighten these screws during maintenance as there is a risk of fracture. If screws appear loosened, replace them)
- Check that the adjustment of the brake screws has been performed.
- Check the presence of the safety rings with retaining screw.
- Check the presence of the bumpers and caps.
- Check the presence of the discs inside the caps of shafts 2 and 3 SATX.



- Check that the XO cap, if present, is fastened securely.

Fig. 53: Checking the XO cap



WARNING!

Risk of injury

The metal half-rings can be sharp.

The metal half-rings on the spring arm should be handled with care to avoid any risk of cuts.

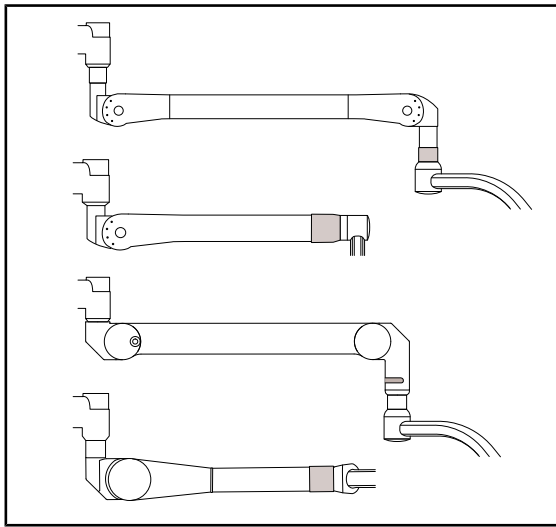


Fig. 54: Acrobat or Ondaspace spring arm

- Check that the vertical stop is properly adjusted.
- Check the balance.
- AC2000: Check the presence of the spring arm safety segment and the replacement periodicity for the DF version, and the presence of the two stop screws for the SF version.
- AC2000 DF and SF: Check that the safety ring is in place with its mounting screw.
- ONDASPACE SF: Check the presence of the spring arm safety segment and the replacement periodicity.
- ONDASPACE SF: Check that the safety ring is in place with its mounting screw.
- Check the correct installation of the covers and tightening of the screws and round covers.
- Check the condition, position and sliding of the tabs.

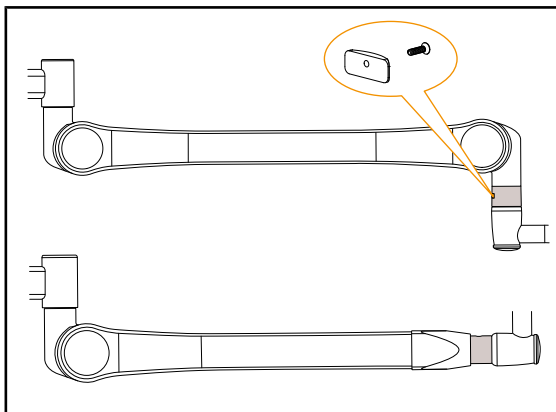


Fig. 55: Oasys spring arm

- Check that the vertical stop is properly adjusted.
- Check the balance.
- OASYS DF: Check the presence of the spring arm safety segment and the replacement periodicity.
- OASYS SF: Check the replacement periodicity of the two spring arm safety segment.
- OASYS DF: Check the presence of the safety ring and cover with holding screw.
- OASYS SF: Check that the safety ring is in place with its mounting screw.
- Check the correct installation of the covers and tightening of the screws and round covers.
- Check the condition, position and sliding of the tabs.

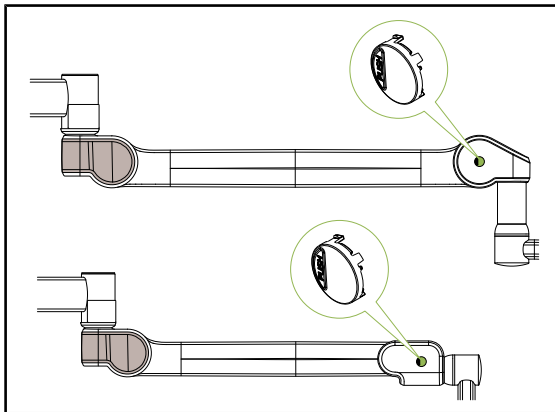


Fig. 56: Valia spring arm

- Check that the vertical stop is properly adjusted.
- Check the balance.
- VALIA DF: Check the presence of the spring arm safety segment and the replacement periodicity.
- VALIA SF: Check the replacement periodicity of the spring arm safety segment.
- VALIA: Check the correct installation of the covers, flanges, and the tightening of the screws.
- VALIA: Check the presence of the flange covers and screw covers.
- Check the position and sliding of the tabs.

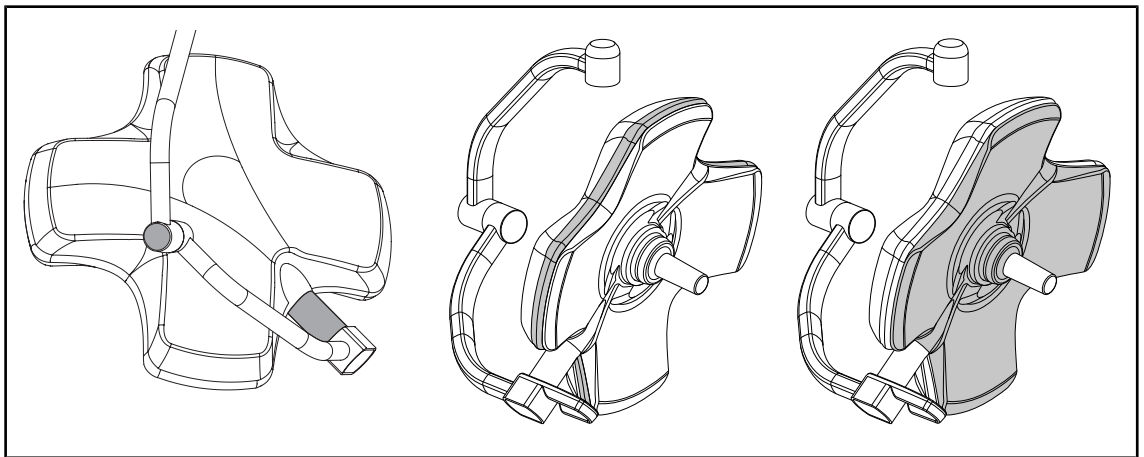


Fig. 57: Lighthouse

- Check that the silicone covers, seals and cover are not loose.
- Check that there are no cracks or scratches on the underside.

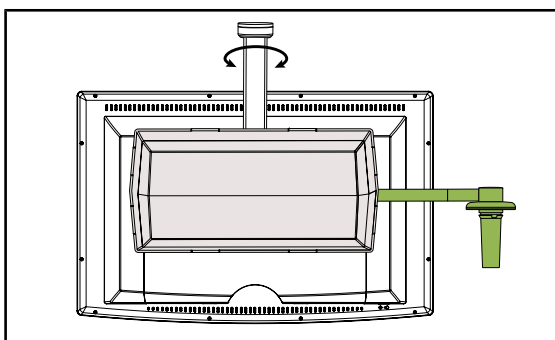


Fig. 58: Monitor mount

- Check the position of the stops for the orientation angles.
- Check that the handle mount is firmly attached.
- Check that the VESA interface is firmly attached to the mount and monitor.
- Check that the Rear Box and its contents are securely fastened.
- Check that the caps are fully inserted.
- Check that the adjustment of the brake screws has been performed.

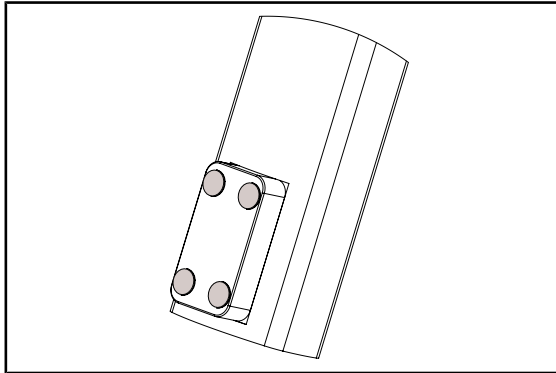


Fig. 59: MHS0 cable guide

- If a cable guide solution is fitted, check that the clips are fastened securely.

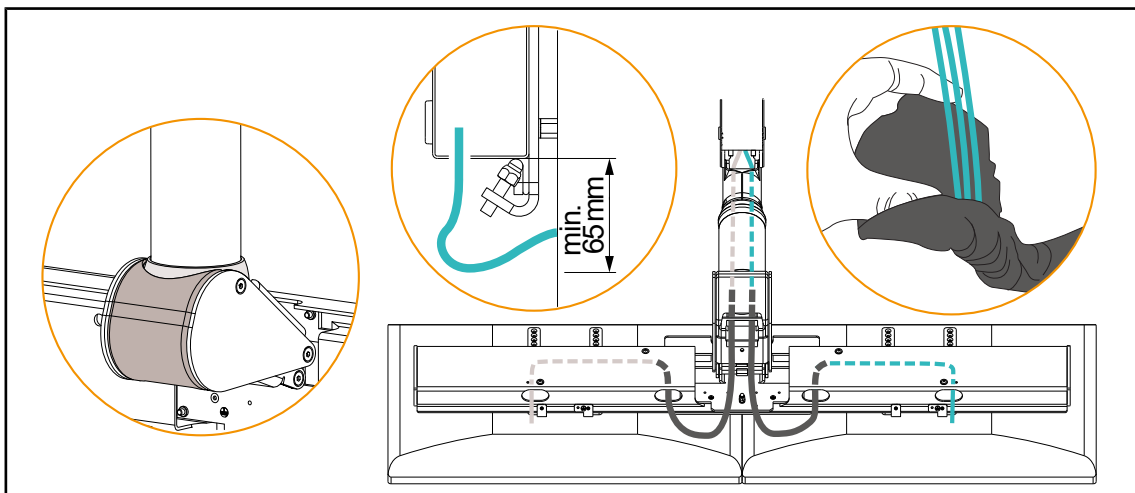
**WARNING!****Risk of injury****A wrong handling of XHD1 screen holder may result in a hand injury.****Respect safety indications on the product.**

Fig. 60: XHD1 monitor mount

- XHD1: Check that the slip ring is lowered all the way.
- XHD1: Check that the cable protective sheath is installed properly and with the required 65-mm minimum clearance.
- XHD1: Check that the grey cover is closed.
- XHD1: Check that the caps at each end of the rail are fully inserted.
- XHD1: Check the ground connections.



- Check that there are no cracks or scratches.

Fig. 61: Monitor

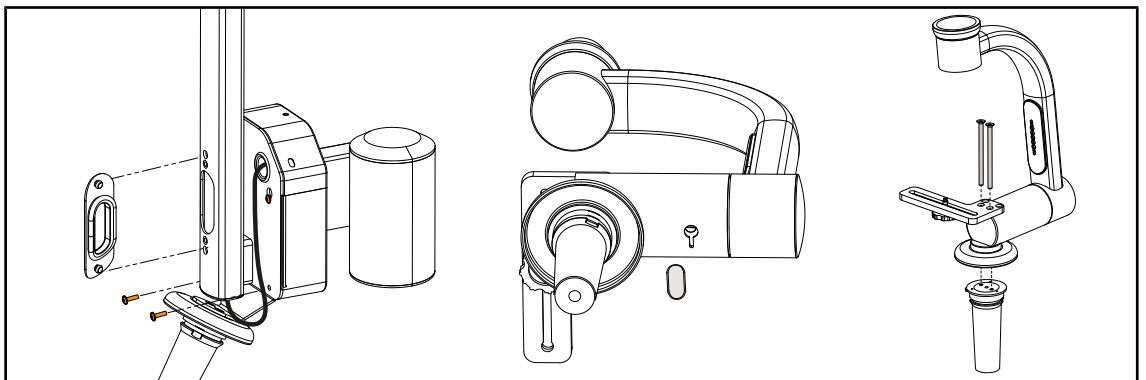
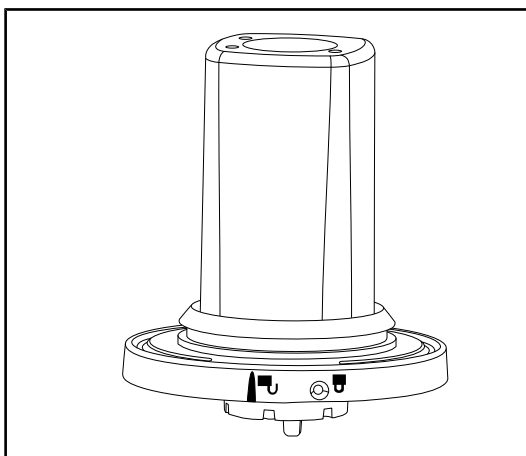


Fig. 62: Camera mount

- Check the position of the stops for the orientation angles.
- Check that the handle mount is firmly attached.
- FHS0: Check that the camera mount is firmly attached to the FHS0 mount.
- SC05: Check that the adjustment of the brake screws has been performed.
- SC05: Check that the camera mount and Kodak screw are fastened securely.
- Check that the caps are fully inserted.



- Check the condition of the connector.
- Check the rotation with no image loss.
- Check the general condition of the system.

Fig. 63: Camera

6.2 Electrical inspections

6.2.1 Electrical evaluation

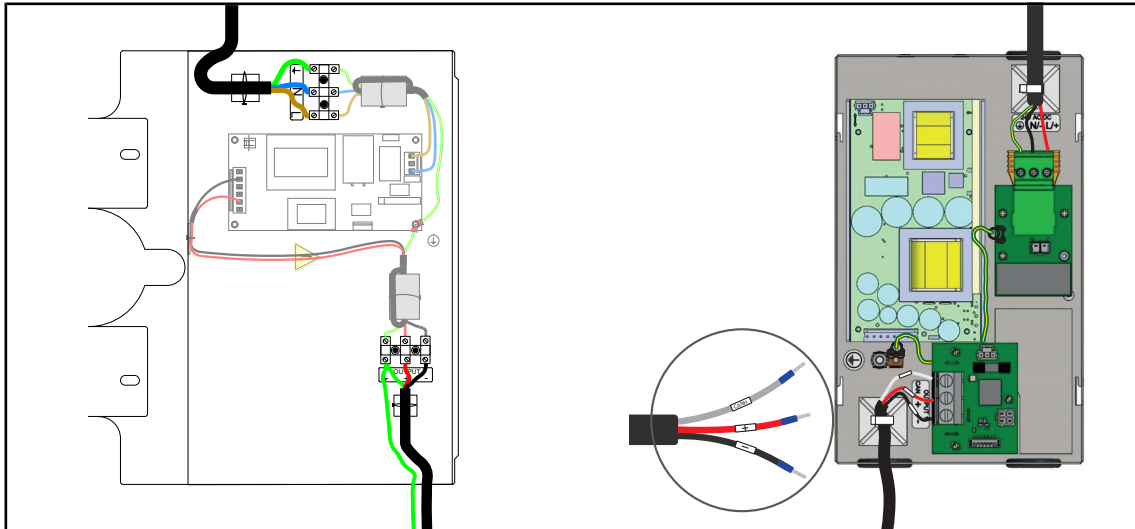


Fig. 64: Ceiling-mounted power supply

- Check the tightening of the connections.
- Check the ground connections.
- Check the general condition of the power supply.

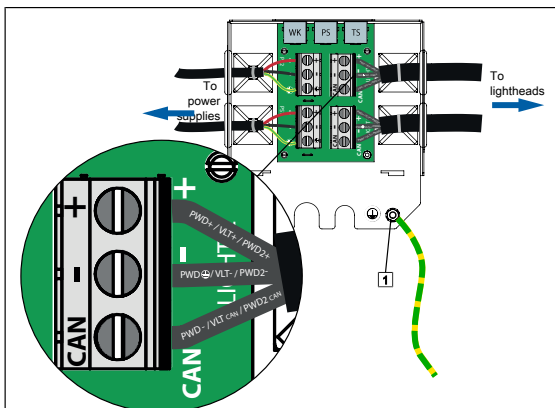


Fig. 65: Connection box

- Check the tightening of the connections.
- Check the ground connections.

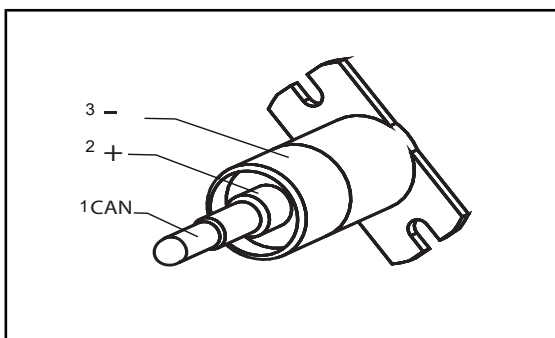


Fig. 66: Identification of the 3-track connector

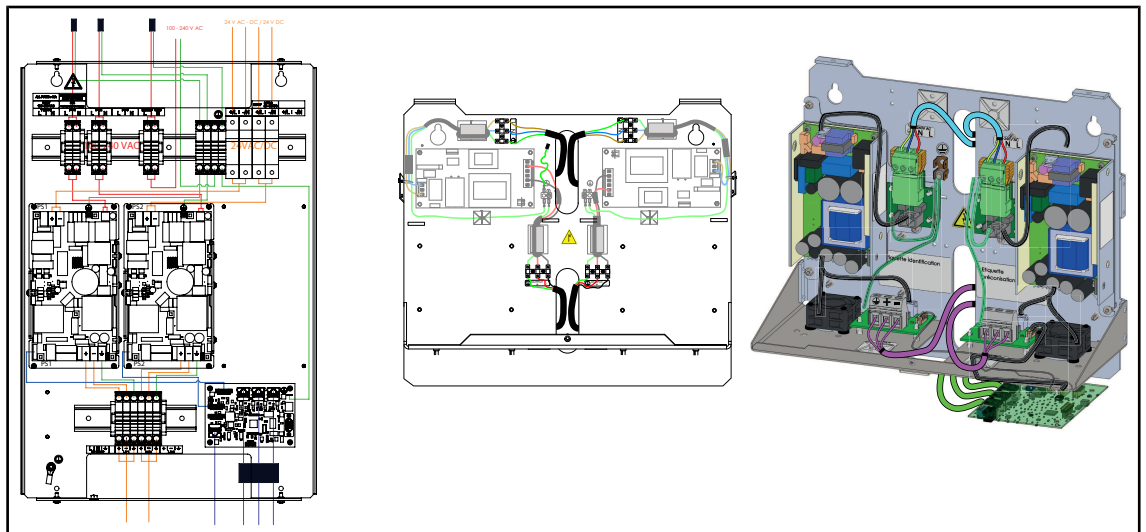


Fig. 67: Wall-mounted power supply

- Check the tightening of the connections.
- Check the ground connections.
- Check the general condition of the power supply.

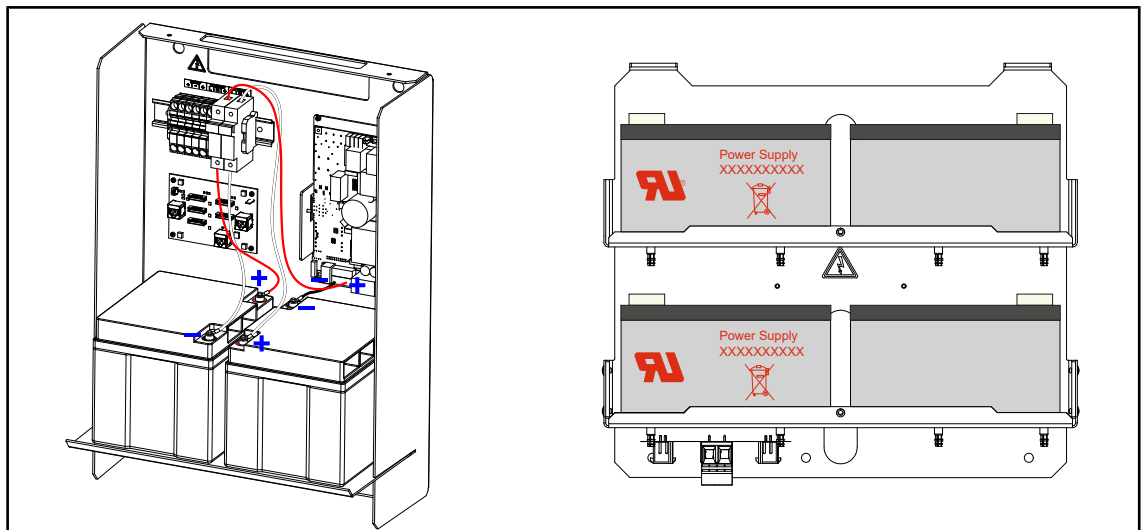


Fig. 68: Backup

- Check the tightening of the connections.
- Check the ground connections.
- Verify the output voltage of the batteries (12 V per battery, difference of voltage between batteries <0.1 V).
- Check the general condition of the backup, the batteries, the absence of swelling, leaks, oxidation.

6.2.2 Performing battery tests



WARNING!

Risk of injury

A battery lifetime test fully discharges the batteries.

Do not perform an operation immediately after a battery lifetime test. Allow time for the batteries to charge.

6.2.2.1 From the wall-mounted control keypad (on VCSII only)

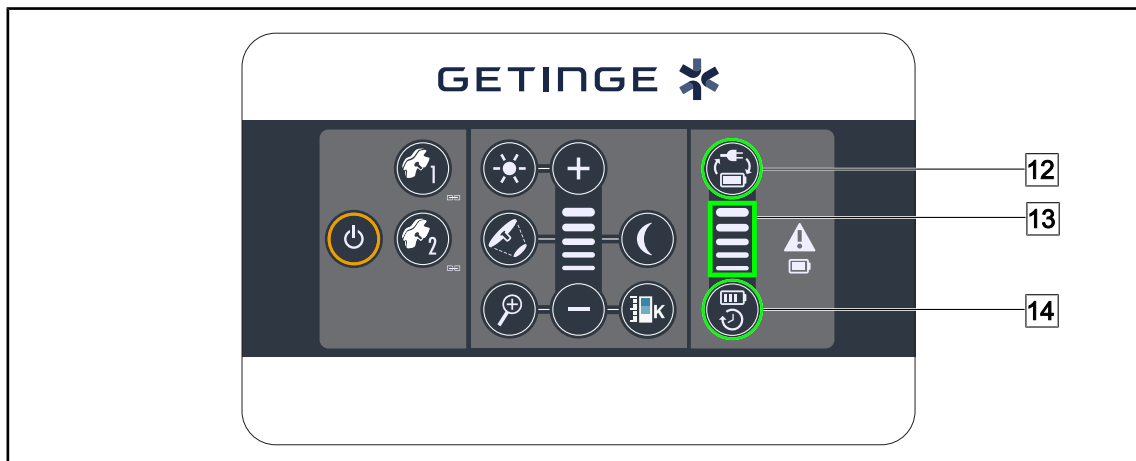


Fig. 69: Battery tests from the wall-mounted keypad

Running a battery backup test

1. Turn off the light.
2. Press **Switchover test** [12].
 - If the test is successful, the battery level indicator [13] flashes green. If the test fails, the battery level indicator [13] flashes red.
3. If the test fails, contact the Getinge technical service department.
4. Press **Switchover test** [12] again and hold until the button turns off.
 - The light remains on at Level 3 and the system is ready for use.

Running a battery life test (only with a Getinge backup)

1. Turn off the light.
2. Press **Battery lifetime test** [14] and hold until the button is backlit.
 - If the test is successful, the battery level indicator [13] flashes green. If the test fails, the battery level indicator [13] flashes red.
3. If the test fails, contact the Getinge technical service department.
 - The light turns off when the test is complete.
4. Press **Battery lifetime test** [14] again and hold until the button turns off.



NOTICE

The battery life test can be stopped at any time by pressing **Battery life test** [14].

6.2.2.2 From the wall-mounted control keypad (on VCS only)

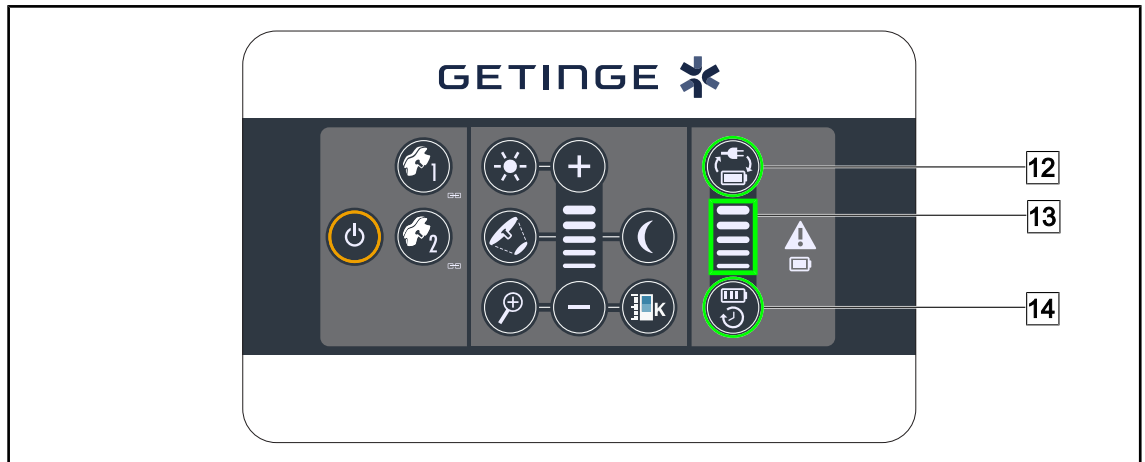


Fig. 70: Battery tests from single the wall-mounted keypad

Running a battery backup test

1. Turn off the light.
2. Press **Battery backup test** [1].
 - If the test is successful, the battery level indicator [2] flashes green. If the test fails, the battery level indicator [2] flashes red.
3. If the test fails, contact the Getinge technical service department.
4. Press **Battery backup test** [1] again and hold until the button turns off.
 - The light remains on at Level 3 and the system is ready for use.

Running a battery life test (only with a Getinge backup)

1. Turn off the light.
2. Press **Battery lifetime test** [3] and hold until the button is backlit.
 - If the test is successful, the battery level indicator [2] flashes green. If the test fails, the battery level indicator [2] flashes red.
3. If the test fails, contact the Getinge technical service department.
 - The light turns off when the test is complete.
4. Press **Battery lifetime test** [3] again and hold until the button turns off.



NOTICE

The battery lifetime test can be stopped at any time by pressing **Battery lifetime test** [3].

6.2.2.3 From the touchscreen control panel



Fig. 71: Battery test

Running a battery backup test

1. Turn off the light.
2. Press **Battery Tests** [1] in the menu bar.
 - The battery tests page is displayed.
3. Press **Battery backup test** [2] to start the test.
 - The date of the most recent battery backup test [6] is updated and a green tick is displayed if the test was successful. If the test fails, however, a red cross and a **Maintenance Information** [4] button are displayed.
4. If the test fails, press **Maintenance information** [4] to access the maintenance information page, and then call the Getinge technical service department.

Running a battery lifetime test (only with a Getinge backup)

1. Turn off the light.
2. Press **Battery Tests** [1] in the menu bar.
 - The battery tests page is displayed.
3. Press **Battery lifetime test** [3] to start the test.
 - The date of the most recent battery lifetime test [7] and the battery lifetime [8] are updated, and a green tick is displayed if the test was successful. If the test fails, however, a red cross and a **Maintenance Information** [4] button are displayed.
4. If the test fails, press **Maintenance information** [4] to access the maintenance information page, and then call the Getinge technical service department.



NOTICE

The battery lifetime test can be stopped at any time by pressing the cross [5].

6.2.3 Electrical safety tests



NOTICE

The electrical safety measurement must be carried out using an IEC 62353-compatible electrical safety tester with 10-A earth resistance measurement capacity. The earth resistance should be less than or equal to 300 mΩ.

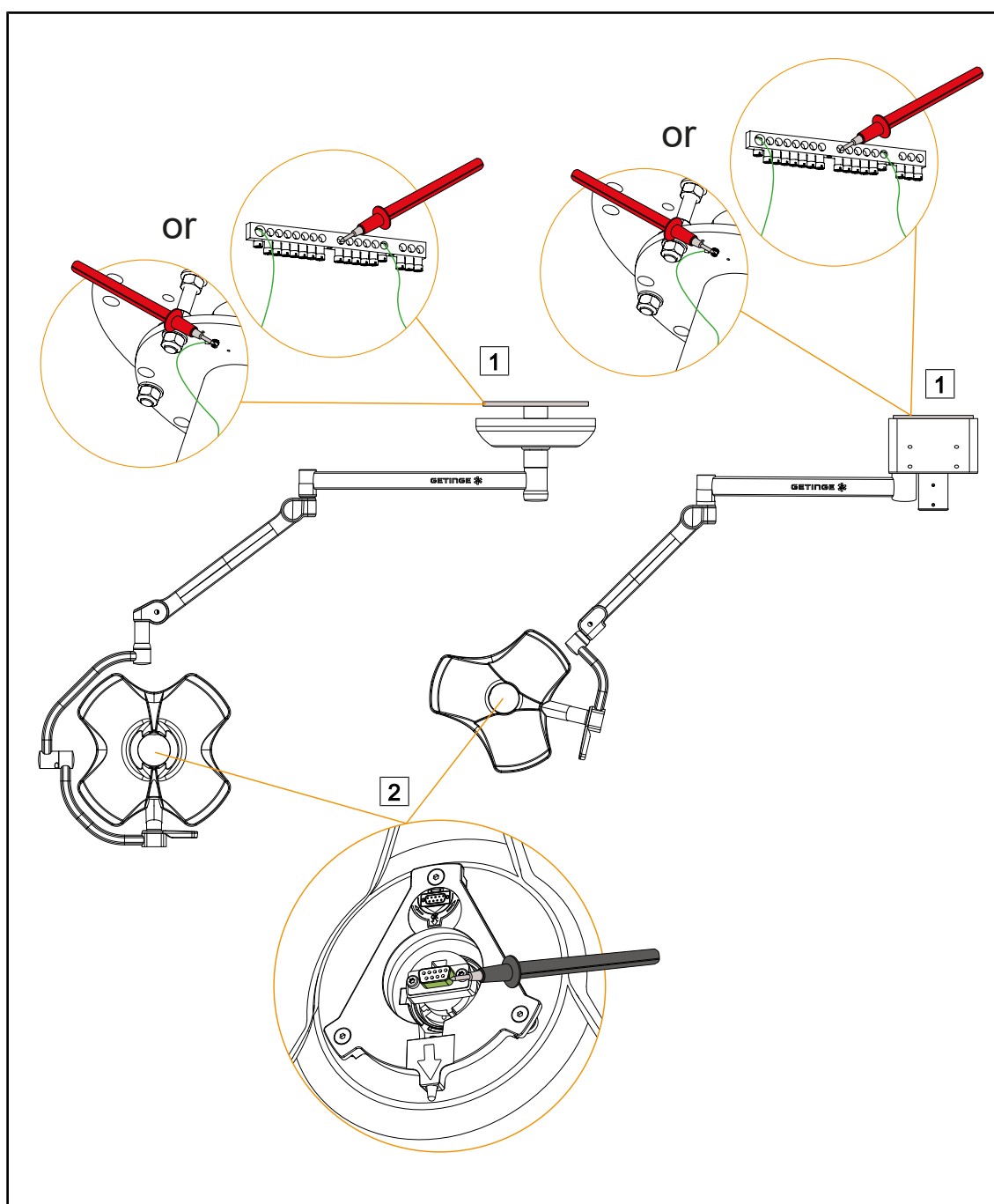


Fig. 72: Electrical safety test

The measurement should be made between the flange [1] and the edge of the connector located in the centre of the lighthead [2].

If any difficulties are encountered, the measurement [2] can be taken on the brake screw of the fork.

FHS0/MHS0/MHD2 monitor mounts

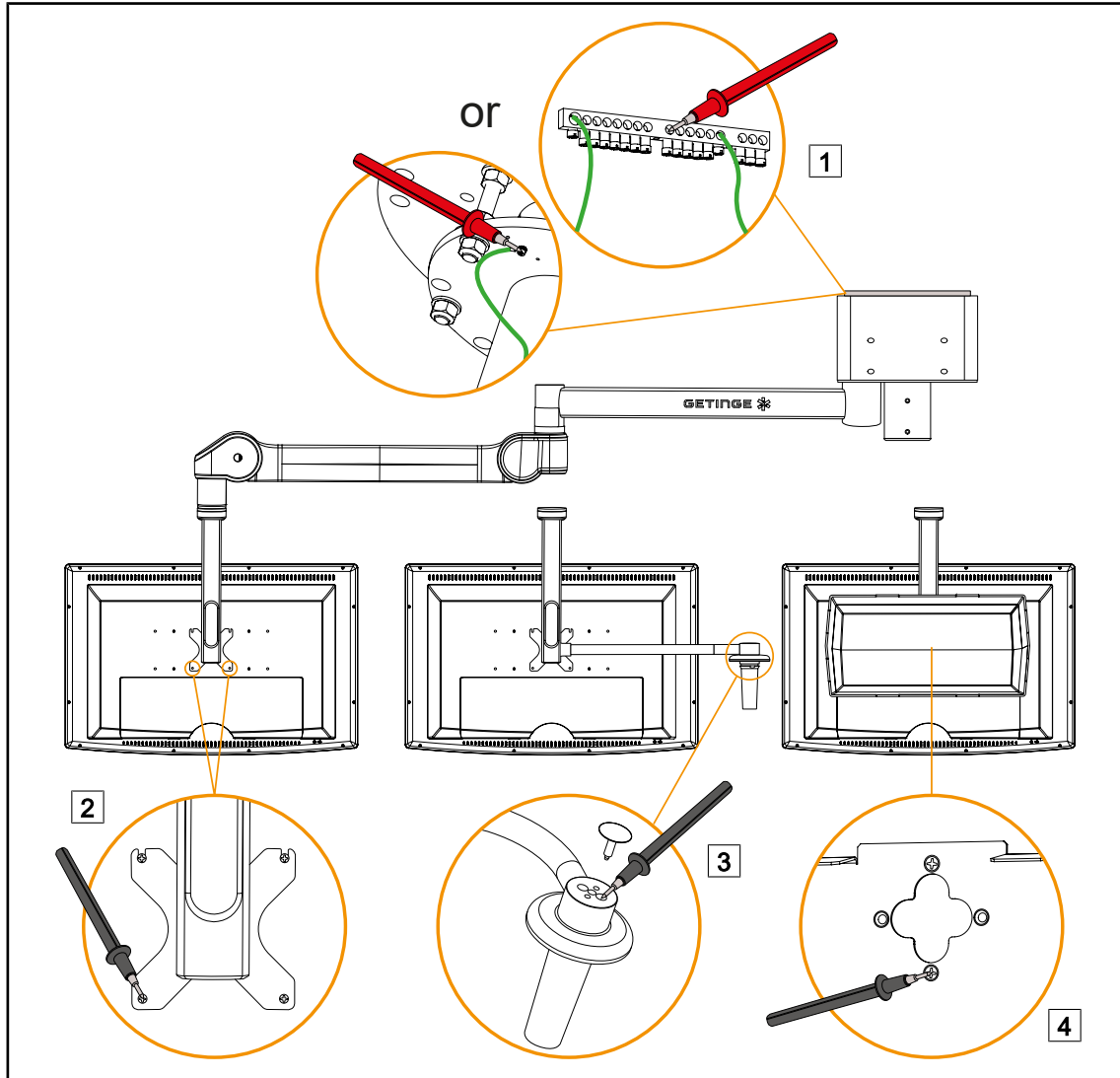


Fig. 73: FHS0/MHS0/MHD2 electrical safety test

- If the monitor mount does not include any accessories, the measurement should be made between the flange [1] and one of the monitor mounting screws [2].
- If the monitor mount includes a handle option, the measurement should be made between the flange [1] and one of the handle mount mounting screws [3]. Once the measurement is made, push the cap in fully using a mallet.
- If the monitor mount includes a Rear Box option, the measurement should be made between the flange [1] and one of the case mounting screws [4], with case cover removed.

XHS0 monitor mount

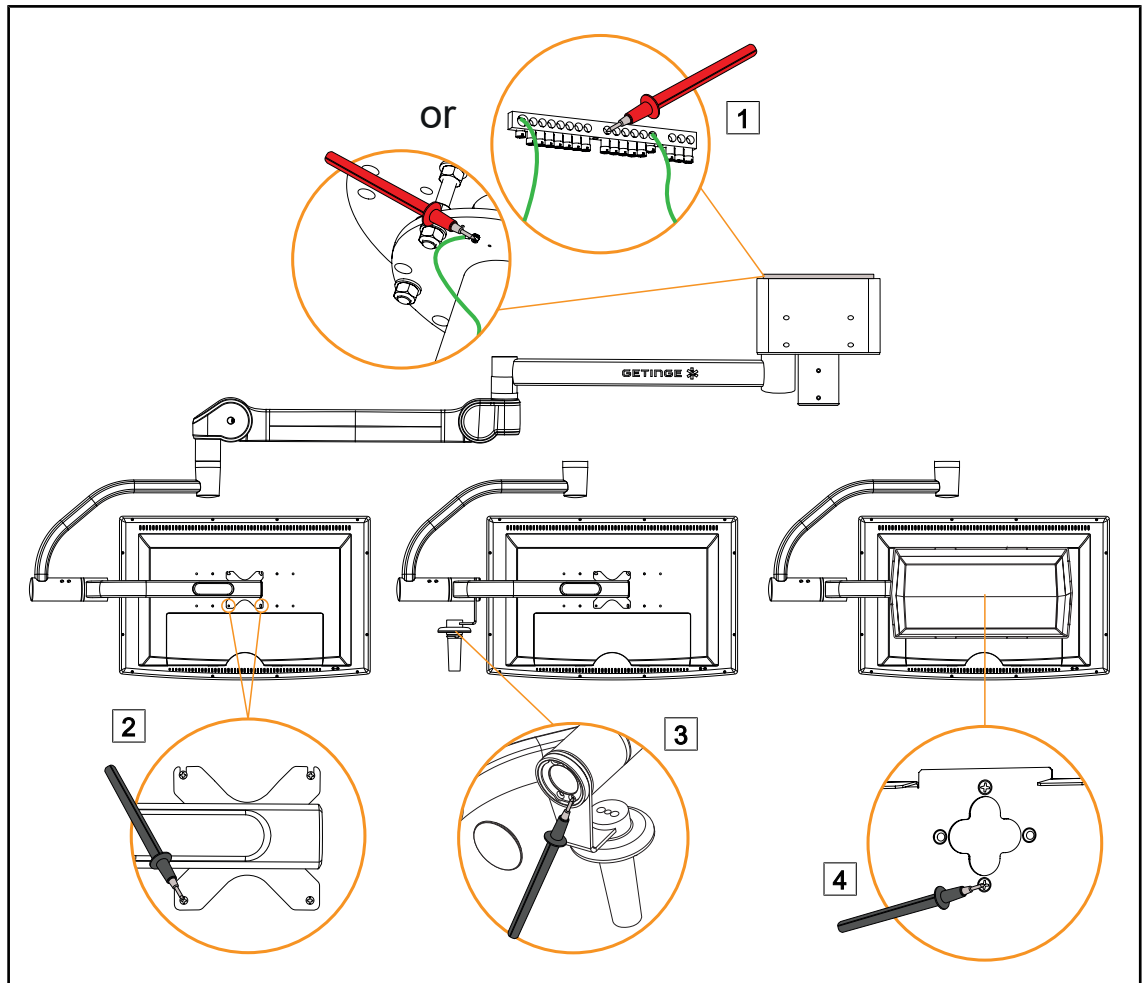


Fig. 74: XHS0 electrical safety test

- If the monitor mount does not include any accessories, the measurement should be made between the flange [1] and one of the monitor mounting screws [2].
- If the monitor mount includes a handle option, the measurement should be made between the flange [1] and one of the handle mount mounting screws [3].
- If the monitor mount includes a Rear Box option, the measurement should be made between the flange [1] and one of the case mounting screws [4], with case cover removed.

XHD1 monitor mount

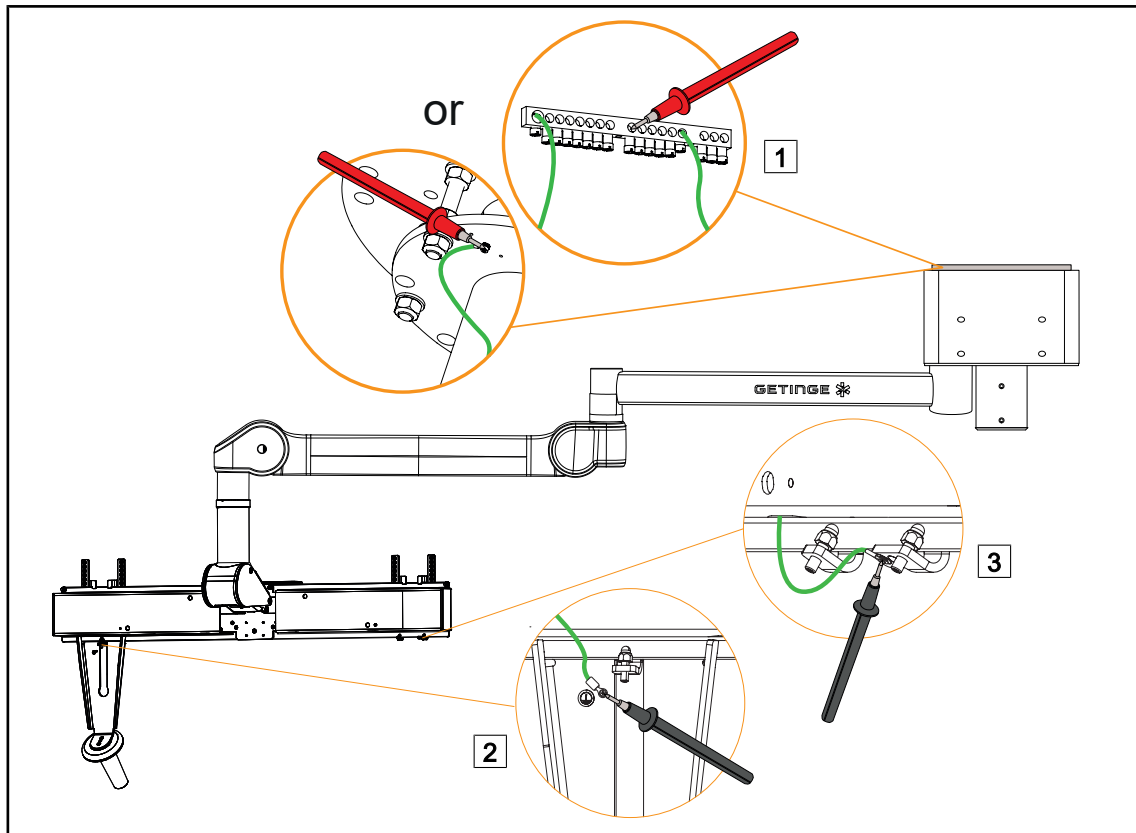


Fig. 75: XHD1 electrical safety test

- If the monitor mount does not include a handle option, the measurement should be made between the flange [1] and the earth wire connection on the VESA block [3].
- If the monitor mount includes a handle option, the measurement should be made between the flange [1] and the earth wire connection on the handle [2].

Camera mounts

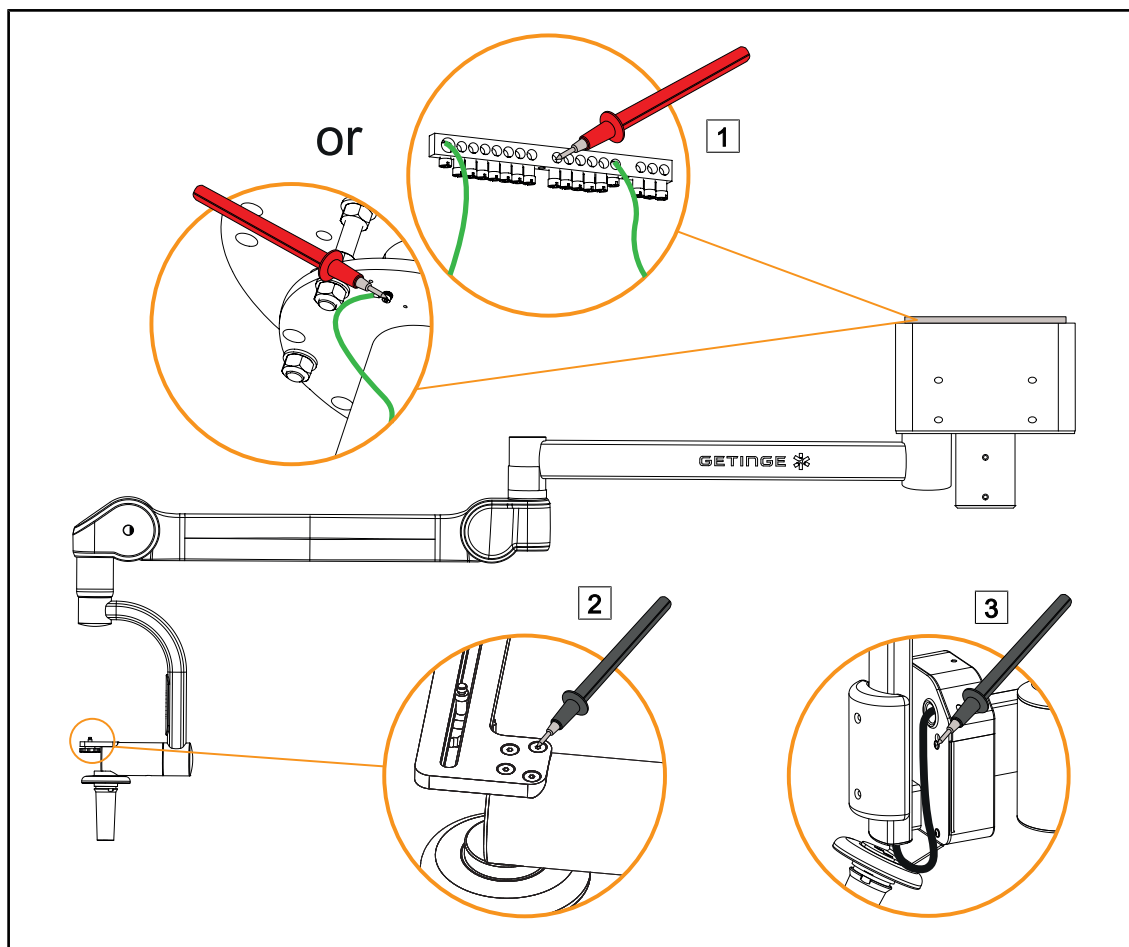


Fig. 76: Electrical safety test of the camera mounts

- For an SC05 camera mount, the measurement should be made between the flange [1] and the screws located on top of the camera mount [2].
- For a camera mount installed on an FHS0 monitor mount, the measurement should be made between the flange [1] and the monitor mount mounting screws [3].

6.3 Functional tests



NOTICE

Protective goggles [Minimum UV Class 2 (EN 170) – Optical Class 1 – Orange shade] are recommended during installation and maintenance work on surgical lights.

- All LEDs operate correctly
- Check that all lighthead keypad functions are working correctly
- Check that all wall-mounted keypad functions are working correctly
- Check that all touchscreen functions are working correctly
- The camera is working properly (video and zoom)
- Switch over to battery mode and back to mains

6.4 Recording the inspection

See also

 SW Service Protocol PM OR Lights VOLISTA-F-EN [61]

SW Service Protocol

Preventive maintenance



Surgical Lighting

VOLISTA



1. Customer

Address	Contact name	Telephone number	Order number

Installation date	Location (department, room number, etc.)

2. Product

Configuration P/N	Configuration S/N	Description
Lighthouse 1 P/N	Lighthouse 1 S/N	Description
Lighthouse 2 P/N	Lighthouse 2 S/N	Description
Equipment 1 P/N	Equipment 1 S/N	Description

The work time for all the service operations described in this documentation is estimated be 1 hour per lighthouse/equipment.

3. Periodic replacements

To ensure safety and performance, please follow the recommendations below.

SB, TUB, TUB SAT, SA arm, SAT arm and A2000 & ONDASPACE spring arm ranges.

Item	Frequency	Replaced	Not replaced	N/A
All brake screws	Every year			
Suspension arm mounting screws and adapters (Tighten the screws to the recommended tightening torque)	Every six years			
Bushing mounting screws (Tighten the screws to the recommended tightening torque)	Every six years			
Spring arm safety segments	Every six years			

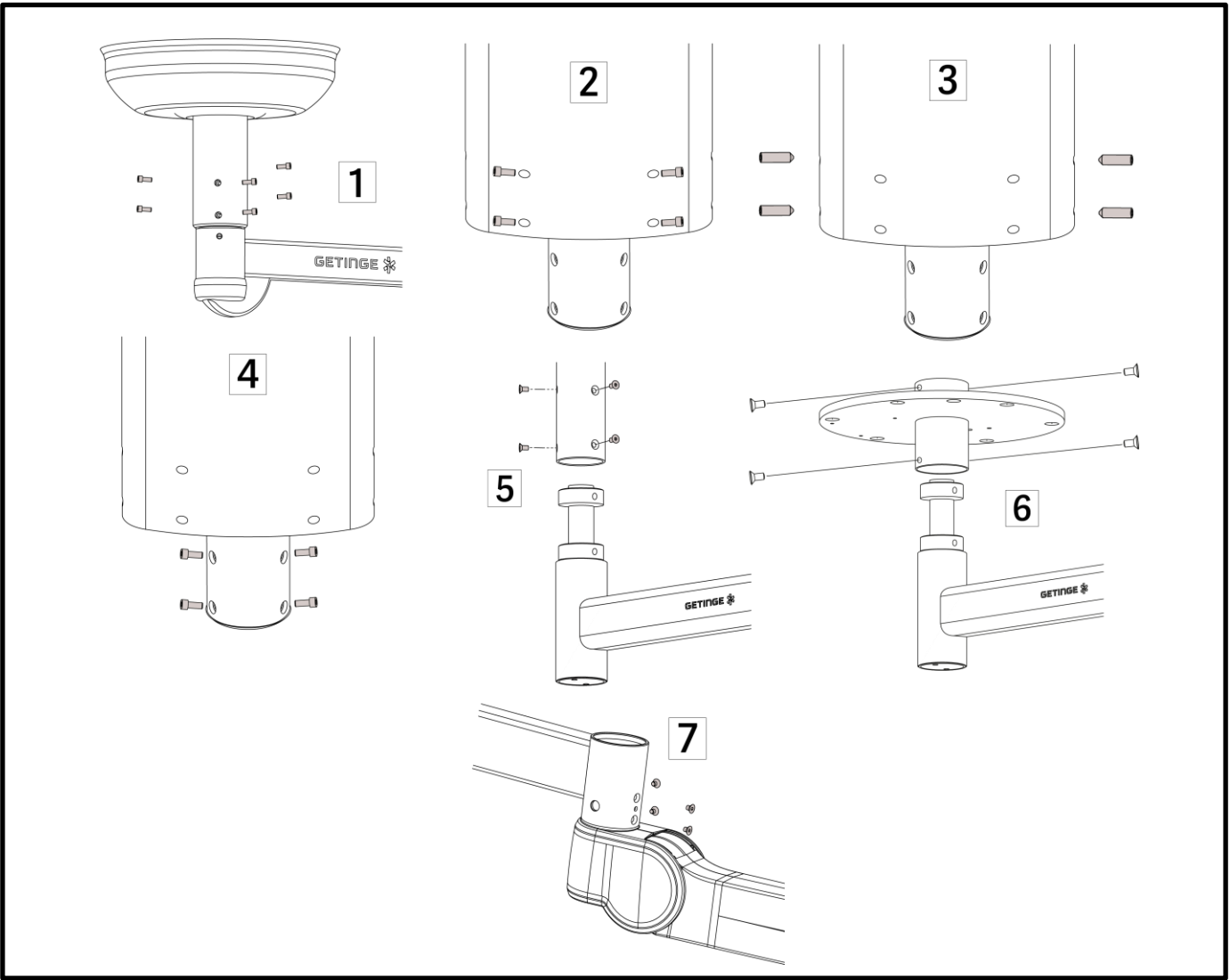
TUBX, TUBX SATX, SAX arm, SATX arm, and VALIA L+LCH and OASYS spring arm ranges.

Item	Frequency	Replaced	Not replaced	N/A
All brake screws	Every year			
Suspension arm mounting screws and adapters (Tighten the screws to the recommended tightening torque)	Every ten years			
Bushing mounting screws (Tighten the screws to the recommended tightening torque)	Every ten years			
Spring arm safety segments	Every ten years			

Batteries

Item	Frequency	Replaced	Not replaced	N/A
Batteries	Every 3 years			

Recommended tightening torques



		SA	SAX	SAT	SATX	SB
1	Suspension mounting screws	16 N.m 11.80 ft.lb	50 N.m 36.87 ft.lb			
2	Suspension mounting screws			16 N.m 11.80 ft.lb	16 N.m 11.80 ft.lb	
3	Suspension mounting screws			16 N.m 11.80 ft.lb	50 N.m 36.87 ft.lb	
4	Suspension mounting screws			16 N.m 11.80 ft.lb	50 N.m 36.87 ft.lb	
5	Suspension mounting screws					16 N.m 11.80 ft.lb
6	Suspension mounting screws					16 N.m 11.80 ft.lb
7	Bushing mounting screws	6 N.m 4.42 ft.lb				

4. Other components replaced or to be replaced

Part No.	Description	Qty	Replaced	To be replaced

5. Calibrated tooling

Description	Registration number	Validity date (DD/MMM/YYYY)

6. Lubrication

OK NOK N/A

Lubrication of the lighthouse fork pin and arm shaft with the grease recommended in MAQUET Ref. ARD659000011			
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7. Mechanical assessment

OK NOK N/A

Anchor point			
Check the tightening of mountings and connectors, terminals and connection boxes.			
Check the ground connections.			
Suspension tube and ceiling cover			
Check the rigidity of the suspension by shaking the assembly.			
Verify the verticality of the tube.			
SAT and SATX tube: Check the tightening of the screws of the half-plates on shafts 2 and 3.			
SB tube: Check the tightening of the cover split rings.			
Check that the cover and retaining and upper seals are secure.			
Check that the silicone sleeve is secure and for the SAT tube the presence of the screw cover labels for shaft 2 and 3.			
Suspension arm			
Check that the suspension linking screws are present on the tube and the periodicity of replacement. (Do not re-tighten these screws during maintenance as there is a risk of fracture. If screws appear loosened, replace them)			
Check that the adjustment of the brake screws has been performed.			
Check the presence of the safety rings with retaining screw.			
Check the presence of the discs inside the caps of shafts 2 and 3 SATX.			
Check that the XO cap, if present, is fastened securely.			
Check that the bumpers and caps are present.			
Spring arm			
Check that the vertical stop is properly adjusted.			
Check the balance.			
AC2000: Check that the safety ring is in place with its mounting screw.			
ONDASPACE SF: Check that the safety ring is in place with its mounting screw.			
Check the correct installation of the covers, the tightening of the screws, round covers.			
OASYS DF: Check the presence of Spring arm safety segment and the replacement periodicity.			

OASYS SF: Check that the safety ring is in place with its mounting screw.			
OASYS: Check the correct installation of the covers, the tightening of the screws, round covers.			
VALIA: Check the correct installation of the covers, flanges, and the tightening of the screws.			
VALIA: Check the presence of the flange covers and screw covers.			
Check the condition, position and sliding of the tabs.			
Lighthouse			
Check that the adjustment of the brake screws has been performed.			
Check that the silicone covers, seals and cover are not loose.			
Check that there are no cracks or scratches on the underside.			
Check that the handle mount is firmly attached.			
Monitor mount			
Check the position of the stops for the orientation angles.			
Check that the handle mount is firmly attached.			
Check that the VESA interface is firmly attached to the mount and monitor.			
MHS0: If a cable guide solution is fitted, check that the four white clips are pushed in securely.			
XHD1: Check that the slip ring is lowered all the way.			
XHD1: Check that the cable protective sheath is installed properly and with the required 65-mm minimum clearance.			
XHD1: Check that the grey cover is closed.			
XHD1: Check that the caps at each end of the rail are fully inserted.			
XHD1: Check the ground connections.			
Check that the Rear Box and its contents are securely fastened.			
Check that the caps are fully inserted.			
Check that the adjustment of the brake screws has been performed.			
Monitor			
Check that there are no cracks or scratches.			
Check that the WIFI receiver and power supply are firmly attached.			
Camera mount			

Check the position of the stops for the orientation angles.			
Check that the handle mount is firmly attached.			
FHS0: Check that the camera mount is firmly attached to the FHS0 mount.			
SC05: Check that the adjustment of the brake screws has been performed.			
SC05: Check that the camera mount and Kodak screw are fastened securely.			
Check that the caps are fully inserted.			
Camera			
Check the condition of the connector.			
Check the rotation with no image loss.			
Check the general condition of the system.			
Configuration			
Check the legibility of all identifications and safety markings.			
Check the manoeuvrability of the configuration.			
Check that there is no corrosion or chipped paint.			

8. Electrical assessment

OK NOK N/A

Ceiling or wall power supply			
Check the tightening of the connections.			
Check the ground connections.			
Check the general condition of the power supply.			
Backup			
Check the tightening of the connections.			
Check the ground connections.			
Verify the output voltage of the batteries. (Record the value)			
Check the general condition of the backup, batteries, absence of swelling, leaks, oxidation.			

9. Optical assessment

Illumination	Nominal value (klx)	Measured value (klx)	OK	NOK	N/A
Ec Max VOLISTA 400	91 < Ec < 160				
Ec Max VOLISTA 400	91 < Ec < 160				
Ec Max VOLISTA 600	91 < Ec < 160				
Ec Max VOLISTA 600	91 < Ec < 160				

Measure the light level in the centre, at a distance of 1 metre, in small-field mode (with the dimmer in the maximum position, or in Boost mode).

The IEC 60601-2-41 standard stipulates limits between a minimum of 40,000 lux and a maximum of 160,000 lux. The minimum acceptable value was calculated based on the nominal value - 30%.

10. Electrical safety tests (IEC 62353)

Ground resistance	Limit (mΩ)	Value measured (mΩ)	OK	NOK	N/A
Resistance of protection ground 1	≤ 300 mΩ				
Resistance of protection ground 2	≤ 300 mΩ				
Equipment 1 protective earth resistance	≤ 300 mΩ				

If available, test records should be attached to this report for possible future use.

11. Functional test

	OK	NOK	N/A
All LEDs operate correctly			
Check that all lighthouse keypad functions are working correctly			
Check that all wall-mounted keypad functions are working correctly			
Check that all touchscreen functions are working correctly			
Check that the camera operates correctly (video and zoom) and check the quality of the image on the screen.			
Switch to battery mode and back to AC mains mode			

12. Cleaning

Degrease and clean the external parts of the configuration		
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13. Final assessment

Configuration operational	
Free from direct risk but deficiencies detected. May be corrected in short term.	
The configuration should not be used until the faults have been corrected.	
The configuration is unsafe. Decommissioning recommended.	

Comments

14. Performed by

Name / Title	Date			Signature
	<i>DD</i>	<i>MMM</i>	<i>YYYY</i>	

15. Facility (Required)

Name / Title	Date			Signature
	<i>DD</i>	<i>MMM</i>	<i>YYYY</i>	

Notes

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GETINGE 



Maquet SAS · Parc de Limère · Avenue de la Pomme de Pin · CS 10008 ARDON ·
45074 ORLÉANS CEDEX 2, France
Tel.: +33 (0) 2 38 25 88 88 Fax: +33 (0) 2 38 25 88 00

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