



Maintenance Manual

Maquet Rolite

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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:

- Installers must be trained and accredited by Maquet SAS.
- This document is the property of Maquet SAS, 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. To keep the information in it up to date, we welcome any comments or information regarding any installation issues that you may have encountered.

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

- Make sure that you have the latest versions of these documents. Check with our Getinge network to confirm that it is the case.
- Make sure that your subcontractor is qualified for the job and ask for proof of certification. Perform regular inspections at the subcontractor's premises and make sure that the subcontractor's facilities meet your own requirements.
- Maquet may not be held liable for any damage or injury resulting from failure to follow these recommendations.

1.2 Other documents relating to this product

- Instructions For Use (Ref. ARD01831)
- Repair manual (Ref. ARD01832)
- Installation manual (Ref. ARD01834)

1.3 Information about this document

1.3.1 Abbreviations

VCS	Volista Access
VST	Volista StandOP
AIM*	Automatic Illumination Management
EMC	Electromagnetic compatibility
FSP*	Flux Stability Program
LMD*	Luminance Management Device
HD	High Definition
K	Kelvin
LED	Light-Emitting Diode
lx	lux
N/A	Not Applicable
SF	Single Fork
WB	White Balance

1.3.2 Symbols used in this manual

1.3.2.1 Cross-references

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

1.3.2.2 Reference numbers

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

1.3.2.3 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.

1.3.2.4 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.

1.3.3 Definitions



1.3.3.1 Hazard levels

The text in the safety instructions describes the 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

1.3.3.2 Indications

Symbol	Indication type	Meaning
	NOTICE	Additional assistance or useful information not relating to risks of injuries or risks of material damage.
	ENVIRONMENT	Information relating to recycling or to appropriate disposal of waste.

Tab. 2: Types of indication in the document

1.3.3.3 Groups of people

Users:

- Users are persons who are authorised to use the device, either by virtue of their qualifications or as a result of receiving training from a qualified person.
- Users are responsible for the safe use of the device and for ensuring that it is used as intended.

Qualified personnel:

- Qualified personnel are persons who have acquired knowledge through specialised training in medical technology or due to their professional experience and knowledge of the safety rules relating to the tasks performed.
- In countries where certification is required to exercise a medico-technical profession, personnel must hold the necessary authorisation in order to be considered as qualified.

2 Safety-related information

2.1 Safety instructions

2.1.1 Technician safety



WARNING!

Risk of injury

If the spring arm is not released before the component is removed, it may spring up abruptly and pose a safety hazard.

Before installing or uninstalling the component, adjust the top limit stop on the spring arm to the horizontal position. Set the spring arm in the horizontal position to remove the component.



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.



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.



WARNING!

Risk of electric shock

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

Installation, maintenance 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 burns

During maintenance 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 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.

2.1.2 Product integrity



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 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 burns

Improper storage of batteries after removal may trigger a fire.

The terminals of used batteries must be insulated.



CAUTION!

Risk of equipment damage

If the cables are inverted during installation or maintenance, a short-circuit may occur when the power is turned on.

Check the polarity of all electrical connections before turning on the power.



WARNING!

Risk of burns

During maintenance 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 infection

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

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

3 Technical characteristics

3.1 Electrical characteristics

3.1.1 Maquet PowerLED II lightheads

Electrical specifications	Maquet PowerLED II 700	Maquet PowerLED II 500
Input voltage	100-240 VAC/50-60 Hz	
Power	185 VA	
Lighthead power rating	110 VA	80 VA
Lighthead input	20 - 28 VDC	
Number of LEDs	100	56
Average service life of LEDs	60,000 hours	
Battery type	Lead gel	

Tab. 3: Table of electrical specifications for Maquet PowerLED II

3.1.2 Volista lightheads

Electrical specifications	Volista 600	Volista 400
Input voltage	100-240 VAC/50-60 Hz	
Power	185 VA	
Lighthead power rating	90 VA	60 VA
Lighthead input	20 - 28 VDC	
Average service life of LEDs	60,000 hours	
Battery type	Lead gel	

Tab. 4: Table of electrical specifications for Volista

3.2 Mechanical specifications

3.2.1 Maquet PowerLED II lightheads

Mechanical specifications	Maquet PowerLED II 700	Maquet PowerLED II 500
Weight of single-fork lighthead	16.8 kg	12.3 kg
Lighthead diameter (including handle)	797 mm	637 mm
Weight of Maquet Rolite device + light-head	119 kg	109 kg
Lighthead protection against dust and liquid ingress	IP44	

Tab. 5: Maquet PowerLED II light mechanical specifications

3.2.2 Volista lightheads

Volista VCS

Specifications	VOLISTA 600	VOLISTA 400
Weight of single-fork lighthead	14 kg	12 kg
Lighthead diameter	700 mm	630 mm
Weight of Maquet Rolite device + light-head	117 kg	115 kg
Lighthead protection against dust and liquid ingress	IP44	

Tab. 6: VCS light mechanical specifications

Volista VST

Specifications	VOLISTA 600	VOLISTA 400
Weight of single-fork lighthead	15.4 kg	12 kg
Lighthead diameter	700 mm	630 mm
Weight of Maquet Rolite device + light-head	118.4 kg	115 kg
Lighthead protection against dust and liquid ingress	IP44	

Tab. 7: VST light mechanical specifications

Mechanical compatibility of the light

Device	Compatibility
Screw-on handle or handle mount	Devon**/Deroyal**

Tab. 8: Mechanical compatibility of the light

3.2.3 Mechanical representation

Overall height of the lighting system

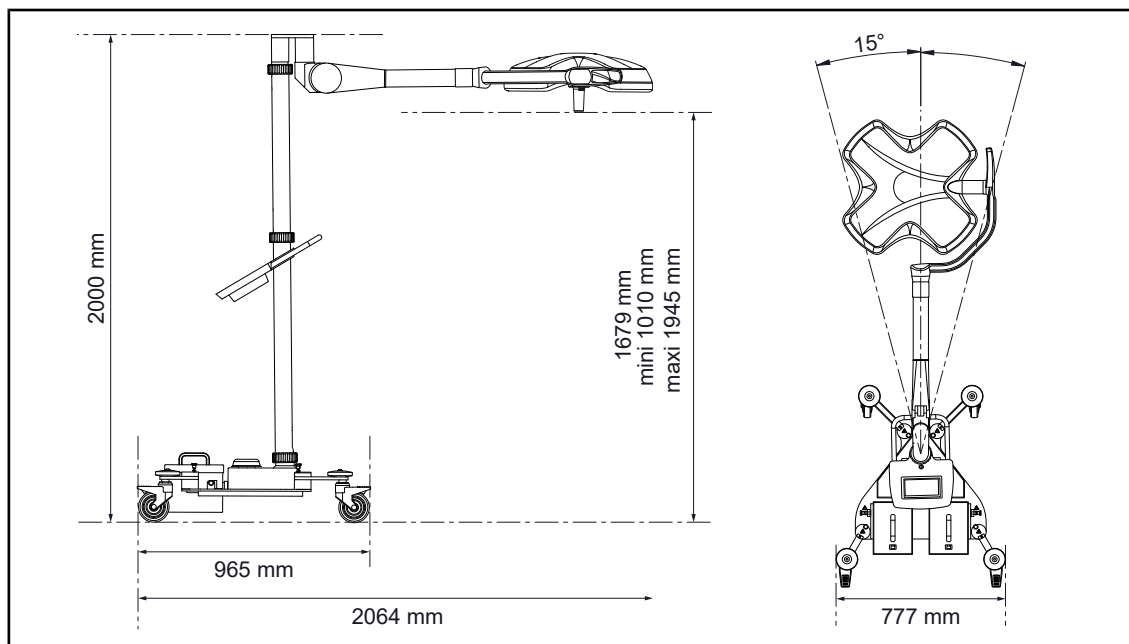


Fig. 1: Overall height of the Maquet Rolite lighting system

Light rotation angles

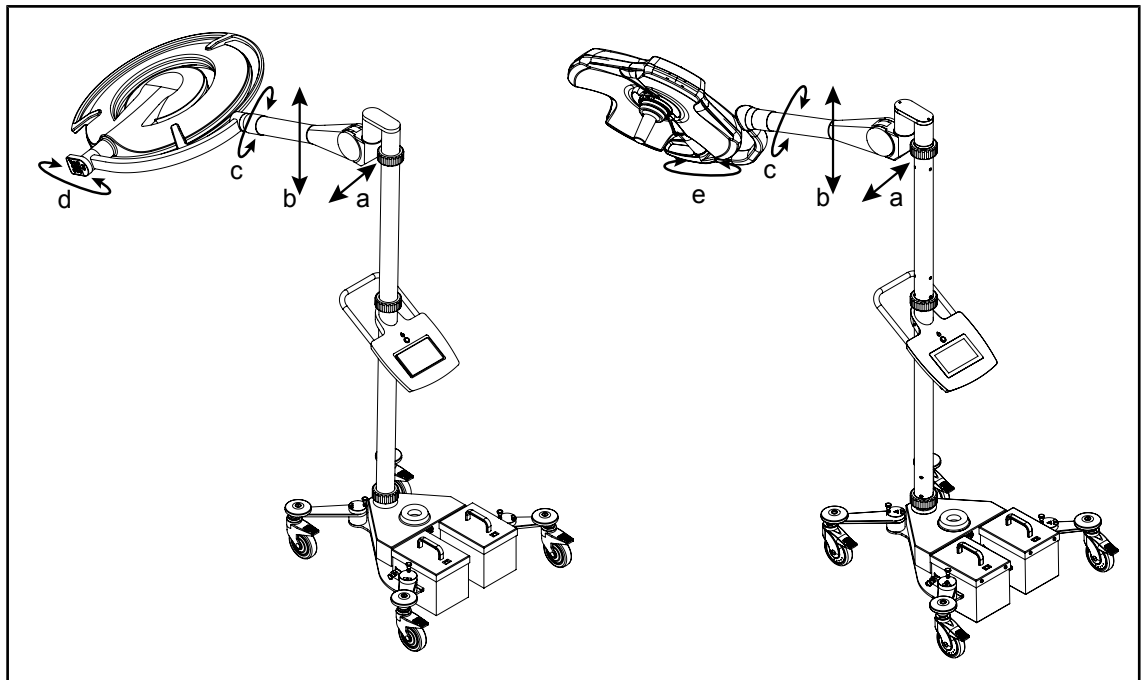


Fig. 2: Maquet Rolite rotation angles

a	b	c	d	e
+15° / -15°	+15° / -40°	360°	250°	330°

Tab. 9: Maquet Rolite rotation angles

3.3 Communication protocol

3.3.1 General remarks regarding the CAN bus

CAN bus (Control Area Network bus) is a serial communication medium that links real-time embedded systems with a high level of reliability. The following main properties are inherent to the structure of the CAN bus protocol:

- Prioritisation of messages.
- Guaranteed latency time.
- Flexible configuration.
- Reception from multiple sources with timing synchronisation.
- Multi-master operation.
- Error detection and reporting.
- Automatic retransmission of affected messages as soon as the bus is free again.
- Error distinction: between temporary errors or permanent non-functionality errors at a node. Automatic disconnection of defective nodes.

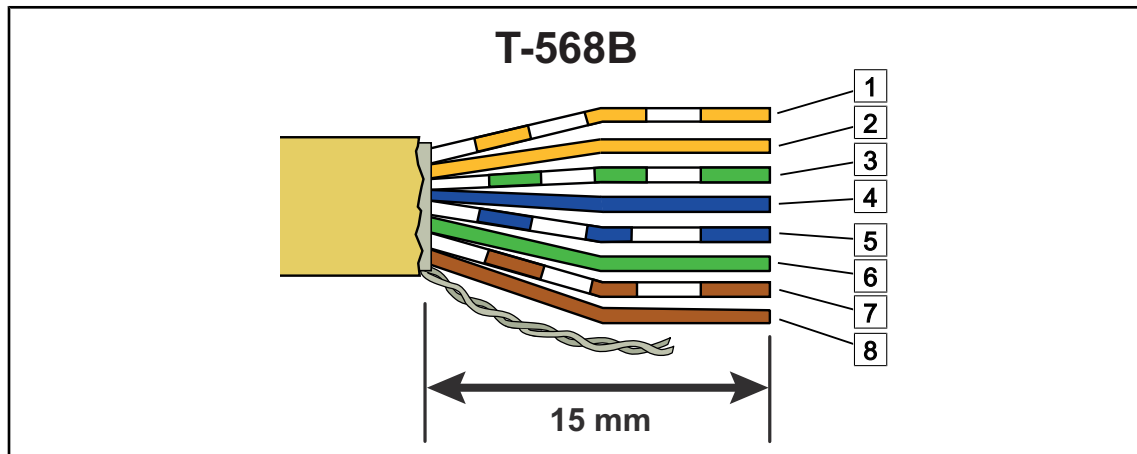
The CAN bus uses a broadcast method for communication: each tool (lighthouse, power supply, camera) connected to the network listens to the frames transmitted by the transmitting tools.

Then, each component (lighthouse, power supply, camera) decides what to do next.

The CAN protocol allows multiple tools to access the bus simultaneously. This is a quick and reliable arbitration process to determine which tool transmits first.

Access to the bus is therefore uncertain, as a tool can transmit at any time. This access is done by priority, this method is called CSMA CD/AMP (Carrier Sense Multiple Access / Collision Detection with Arbitration on Message Priority).

Description of the MAQBUS communication connections on the RJ-45 connector:



1	Reserved	2	Reserved
3	CAN H	4	24 V
5	24 V	6	Can L
7	0 V	8	0 V

3.4 Diagrams

3.4.1 Electrical wiring block diagram

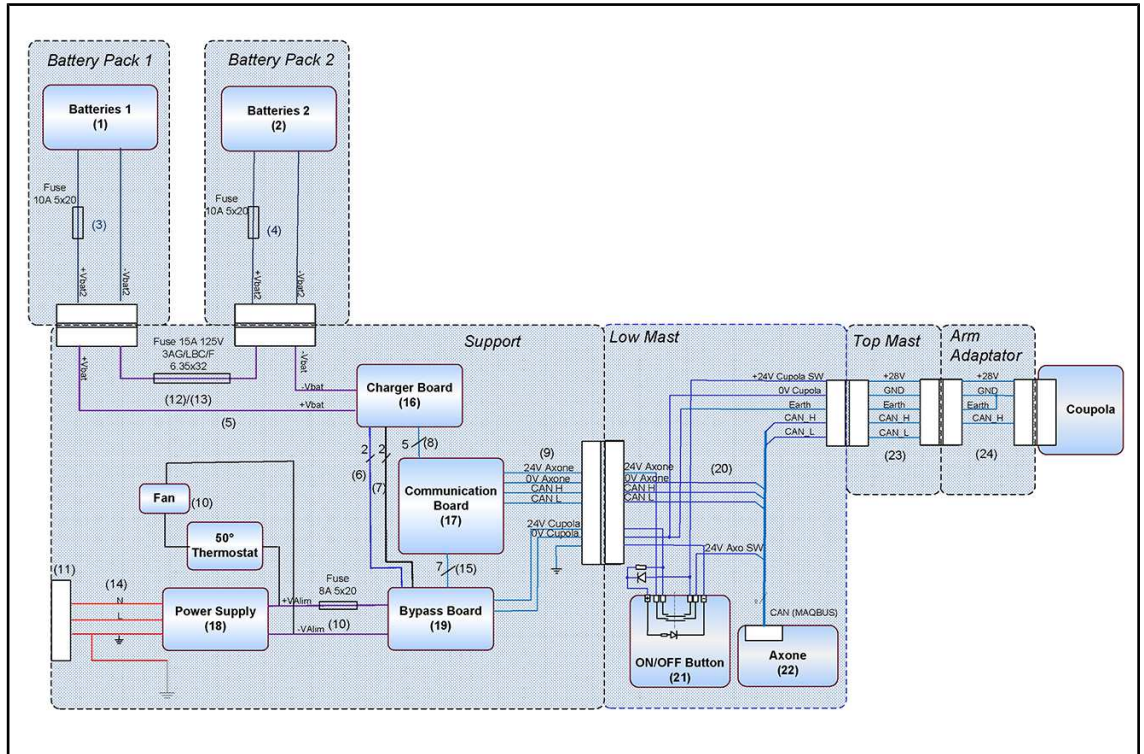


Fig. 3: Electrical wiring block diagram

3.4.2 Electrical connections

Not applicable to this product.

4 Maintenance and inspection procedures



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.



NOTICE

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

The LinkOne platform is accessible on the GetingeOnline portal:
getingeonline.com/SIS/external-links

4.1 Tools required for maintenance

Part number	Description
ARD572034999	OPM 039 - Photometer
ARD572059999	OPM 059 - Multimeter M54 RMS
ARD659000011	Grease in can
ARD659000016	Grease in aerosol

Tab. 10: Tools required for maintenance

4.2 Periodic replacements

4.2.1 Periodic replacement cycles

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

Elements	Frequency
All brakes	Every year
Safety segment of the spring arm	Every six years
Batteries	Every three years

Tab. 11: Periodic replacement cycles

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 burns

Improper storage of batteries after removal may trigger a fire.

The terminals of used batteries must be insulated.



NOTICE

Always disconnect the power supply cable by pulling on its plug; never pull on the cable itself.

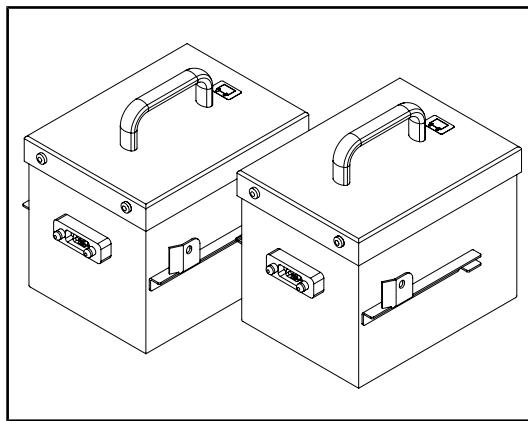


Fig. 4: Battery pack

- Disconnect the power supply cable.
- Detach the lighthead from the spring arm.
- Pull up on the battery pack lock/release pin on the side of the base.
- To remove the battery packs, slide them, one after the other, backwards on the guides, keeping the locking/unlocking pin pulled.
- Remove the four screws holding the battery pack covers.

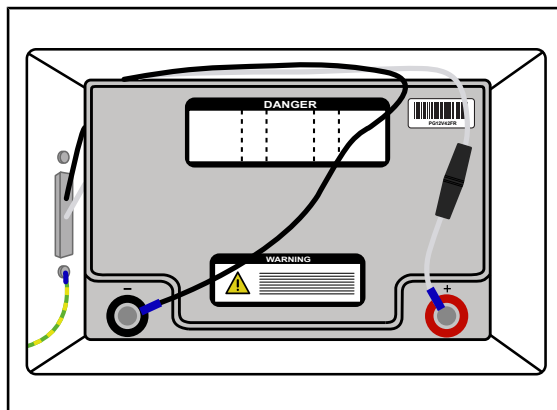


Fig. 5: Disconnecting battery wires

- Disconnect the battery wires.
- Insert the new battery, ensuring that the polarity is correct, and put the cover back on. Repeat for the second battery.

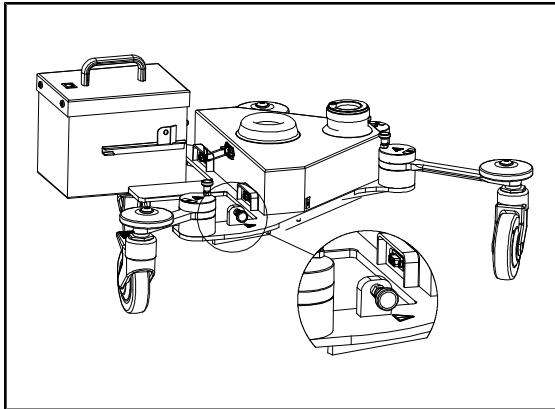


Fig. 6: Locking the battery pins

- Slide the two new battery packs onto the slides until you hear a "click" to indicate that they are correctly in place.
- Place the lighthead on the spring arm.

If the device is fitted with batteries and the batteries are charged:



NOTICE

If the device is not connected to the mains for a period of at least 2 consecutive months, the batteries may be permanently damaged.

To avoid charging incidents, follow the instructions below:

1. Regularly plug the device into a mains supply (e.g. once a week).
2. Disconnect the batteries if the device is not scheduled to be used for more than two months.

Battery charge time (for devices with batteries):

- At least 11 hours.

Servicing and storing the batteries

The storage time of batteries (new batteries) must not exceed

- Six months at an ambient temperature of 20°C.
- Three months at an ambient temperature of 30°C.

Beyond this period, they must be recharged:

- Every six months, when stored indoors at a normal ambient temperature (20-30°C).
- Every three months, when stored indoors at a temperature of 30-40°C.



NOTICE

Batteries must be handled as special waste. Either send them to a metallurgical plant for recycling or contact the manufacturer to obtain information on how to dispose of them.

4.3 Adjustments

4.3.1 Installing the spring arms

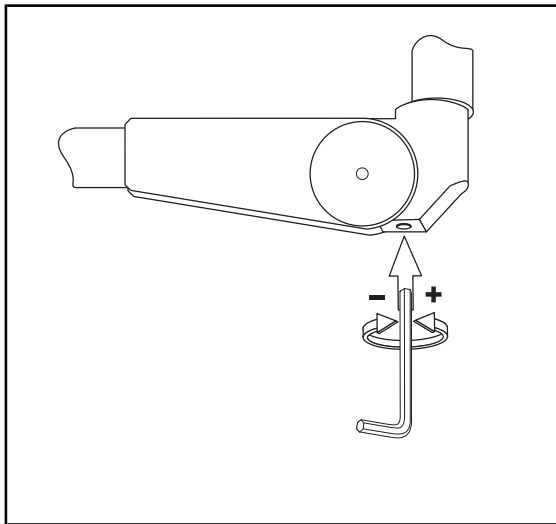


WARNING!

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.

Adjusting the balance of the Ondaspace**/ Acrobat 2000 spring arm



- Ondaspace** Unscrew the protective cap and insert a 6-mm Allen key in the opening.
- Acrobat 2000 Insert a 6-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, screw in (turn towards -) to decrease the force of the spring arm.

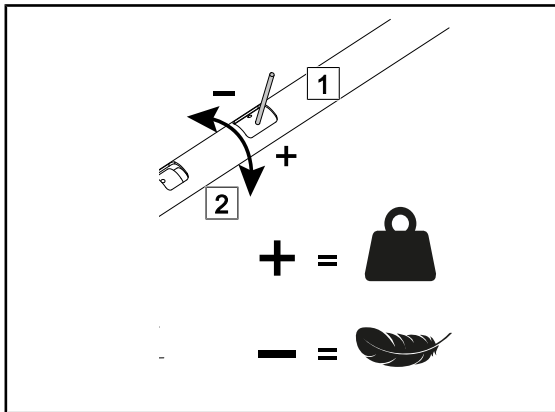
Fig. 7: Adjusting the spring arm



NOTICE

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

Adjusting the tension in the OASYS spring arm



- Removing the side covers
- 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 [2] the nut so as to increase the tension.
- If the spring arm tends to move up, the spring arm tension is excessive.
 - Rotate [2] the nut so as to decrease the tension.

Fig. 8: Adjusting the tension

4.3.2 Adjusting the brakes



CAUTION!

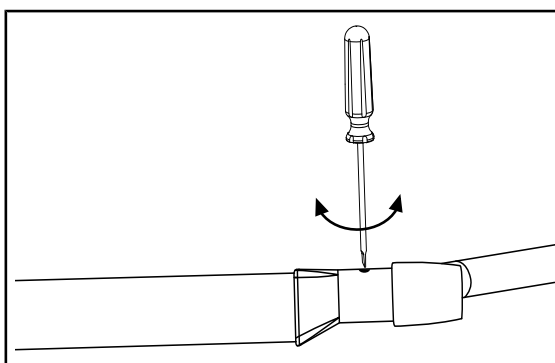
Risk of equipment damage

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.

4.3.2.1 Spring arm brakes

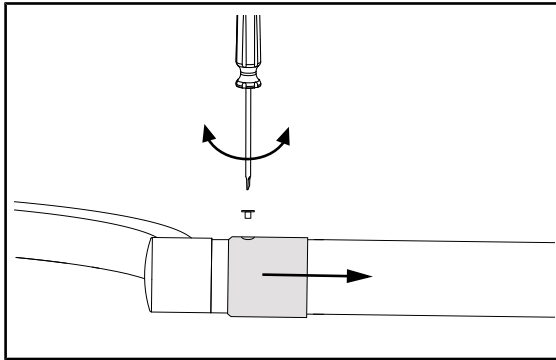
PWD II 500, VST, VCS spring arm (3 tracks)



- Tighten to apply the brakes.
- Loosen to release the brakes.

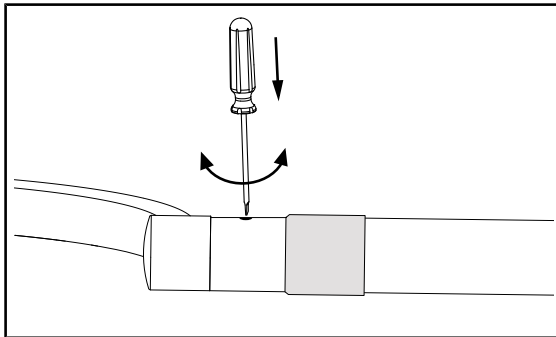
Fig. 9: Adjusting the brakes

PWD II 700 / VST 600 spring arm (5 tracks)



- Use a flat-bladed screwdriver to remove the sliding ring mounting screw.
- Slide the sliding ring along the arm.

Fig. 10: Removing the mounting screw



- Adjust the brake screws using a flat-bladed screwdriver.
- Slide the sliding ring and fasten it in place using its mounting screw.

Fig. 11: Adjusting the brake screws

4.3.2.2 Lighthouse brakes



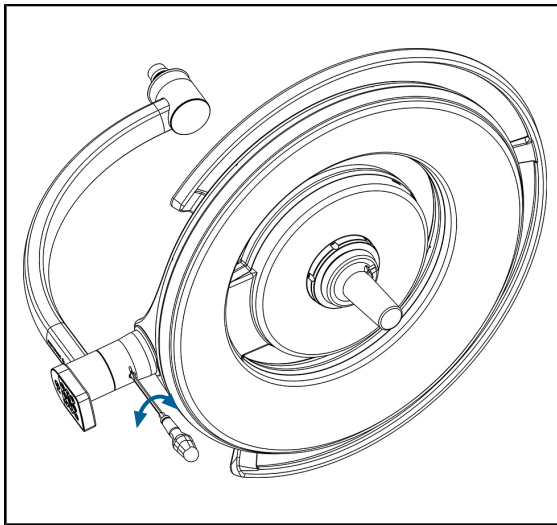
WARNING!

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.

On Maquet PowerLED II



- Tighten to apply the brake.
- Loosen to release the brake.

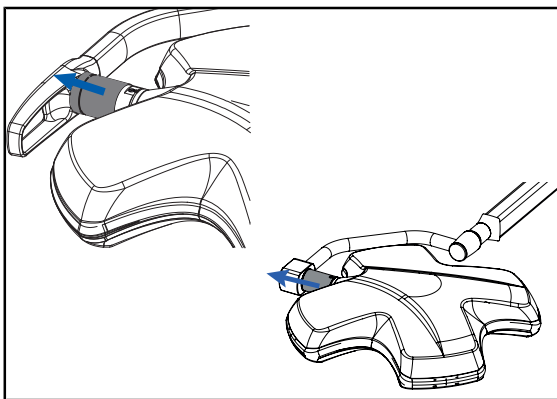
Fig. 12: Adjusting the brakes



NOTICE

Move the captive silicone cap out of the way to carry out this step. Make sure it is reinstalled correctly once the adjustment is made.

On Volista



- Slide the grey cover to reveal the fork section containing the brake and the snap ring.

Fig. 13: Accessing the snap ring

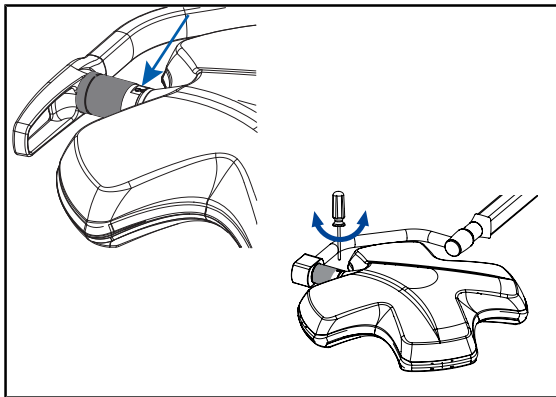


Fig. 14: Positioning the snap ring

- Check that the snap ring is correctly in place and adjust the brake if necessary:
 - Tighten to apply the brake.
 - Loosen to release the brake.
- Slide the grey cover back into position in order to cover this part of the fork again.



WARNING!

Risk of injury

If a snap ring is missing or installed incorrectly, a component or part may fall from the device.

Check that all snap rings are properly installed.

4.3.3 Touchscreen control panel settings



NOTICE

The installation date must be entered in the window that appears during initial commissioning.



Fig. 15: Touchscreen control panel settings page

Adjusting the screen brightness

1. Press **Settings** [1] in the menu bar.
 - The Settings page is displayed (see above).
2. Press **Screen Brightness** [2].

- The brightness setting page is displayed.

Setting the date and time and using the stopwatch/timer

1. Press **Settings** [1] in the menu bar.
 - The Settings page is displayed (see above).
2. Press **Date/Time** [3].
 - The page for date and time settings and stopwatch/timer functions is displayed.

Adjusting the tilt handle

1. Press **Settings** [1] in the menu bar.
 - The Settings page is displayed (see above).
2. Press **Tilt Handle** [4].
 - The tilt handle adjustment page is displayed.

Accessing configuration information

1. Press **Settings** [1] in the menu bar.
 - The Settings page is displayed (see above).
2. Press **Information** [5].
 - The configuration information page is displayed.

4.3.3.1 Screen brightness



Fig. 16: Adjusting the screen brightness

1. Press **Plus** [2] to increase the brightness of the touchscreen control panel or **Minus** [1] to decrease the brightness.
 - The screen brightness varies as shown by the brightness level indicator [3].
2. Press **OK** [5] to confirm the brightness changes, or **Cancel** [4] to cancel the changes in progress.
 - The configured brightness is stored and applied.

4.3.3.2 Date and time

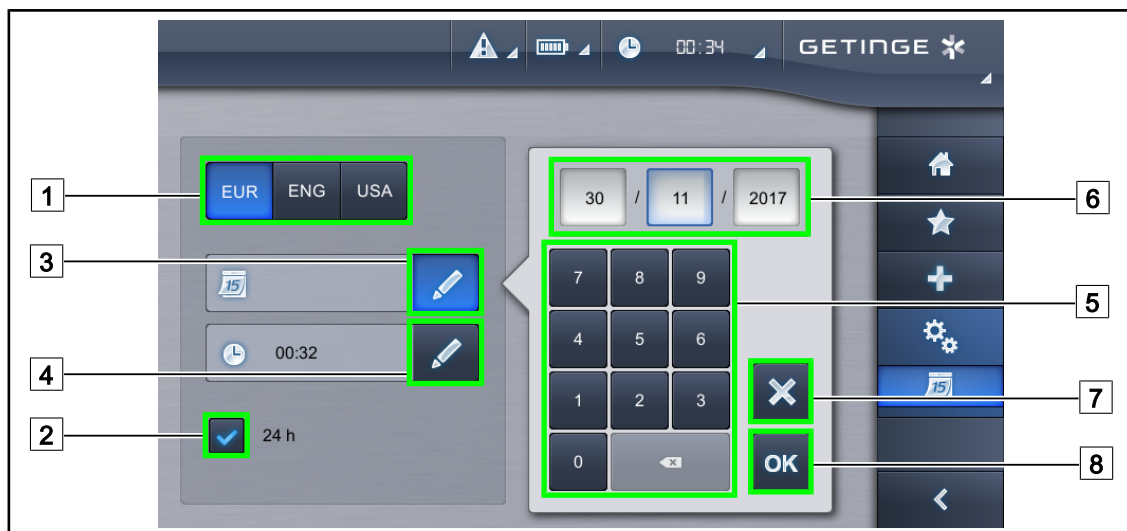


Fig. 17: Date and time settings

Defining the date and time format

1. Press **Date Format** [1] to choose the desired date display format. European, English or American date format can be set.
 - The selected format is shown with a blue background.
2. Press **Time Format** [2] to choose the desired time display format.
 - If the button is selected, times are displayed in 24h format; if not, 12h format is used.

Changing the date

1. Press **Edit Date** [3].
 - A data entry window is displayed.
2. Press the field to be modified: day, month or year [6].
 - The selected field is shown with a blue border.
3. Use the keypad [5] to enter the value and then press **OK** [8] to confirm the changes. To cancel changes in progress, press **Cancel** [7].
 - The data entry window closes and the changes take effect.

Changing the time

1. Press **Edit time** [4].
 - A data entry window is displayed.
2. Press the field to be modified: hours or minutes [6].
 - The selected field is shown with a blue border.
3. Use the keypad [5] to enter the value and then press **OK** [8] to confirm the changes. To cancel changes in progress, press **Cancel** [7].
 - The data entry window closes and the changes take effect.

4.3.3.3 Information

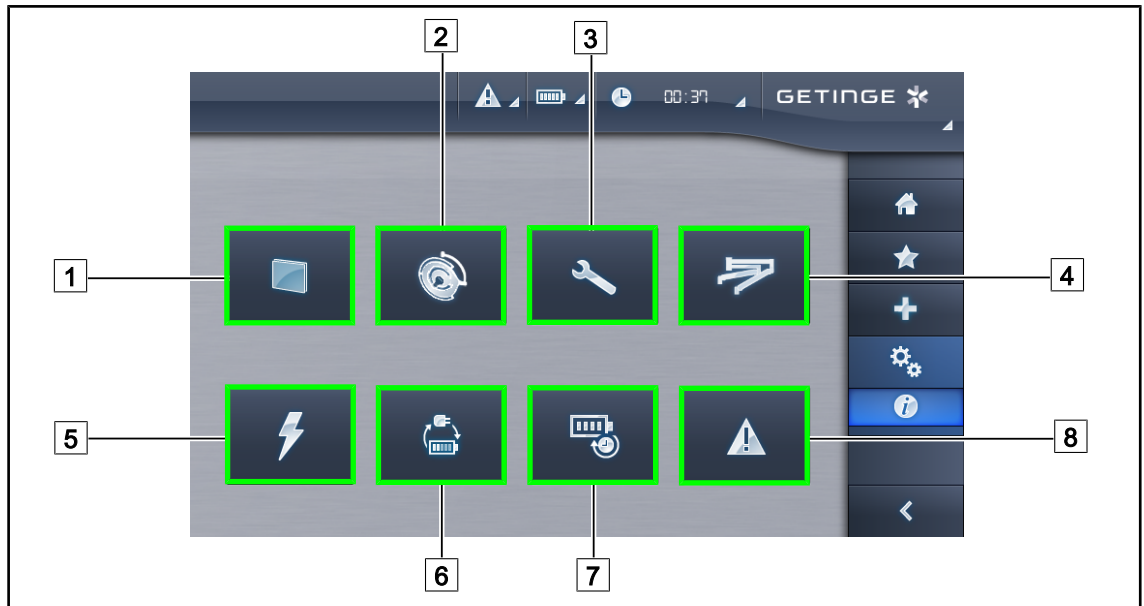


Fig. 18: Information page

- | | |
|-----------------------------|--------------------|
| 1 Touchscreen control panel | 5 Power supply |
| 2 Lightheads | 6 Battery backup |
| 3 Maintenance | 7 Battery lifetime |
| 4 Configuration | 8 Faults |

No	Possible action
.	.
1	Press the Touchscreen control panel button to display the software version and update date, the touchscreen control panel reference, serial number and date of installation.
2	Press Lightheads to display information about the lighthead(s) installed: product reference, serial number, options available, usage hours.
3	Press Maintenance to display the dates on which maintenance was performed and the Getinge contact details.
4	Press Configuration to display the characteristics of the installed configuration (locations of tools and accessories).
5	Press Power supply to display a history of power cuts.
6	Press Battery backup to display a history of battery backup tests.
7	Press Battery lifetime to display a history of battery lifetime tests.
8	Press Faults to display a history of faults.

Tab. 12: All information menus

4.3.3.4 Restarting the touchscreen control panel

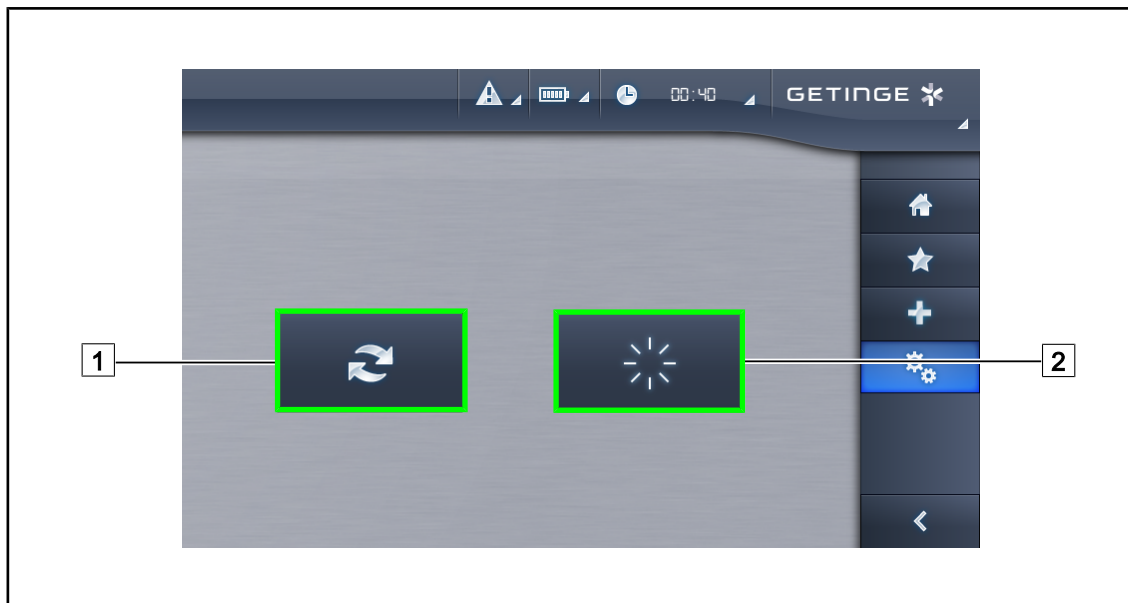


Fig. 19: Reset page



NOTE

The **Reset** [1] button has no effect on the Maquet PowerLED II.

Restarting the touchscreen control panel

1. Press **Restart Screen** [2].
 - A window is displayed.
2. Press the green tick to restart the touchscreen control panel. To cancel restarting and quit this window, press the red cross.
 - The touchscreen control panel restarts.

4.3.3.5 Maintenance

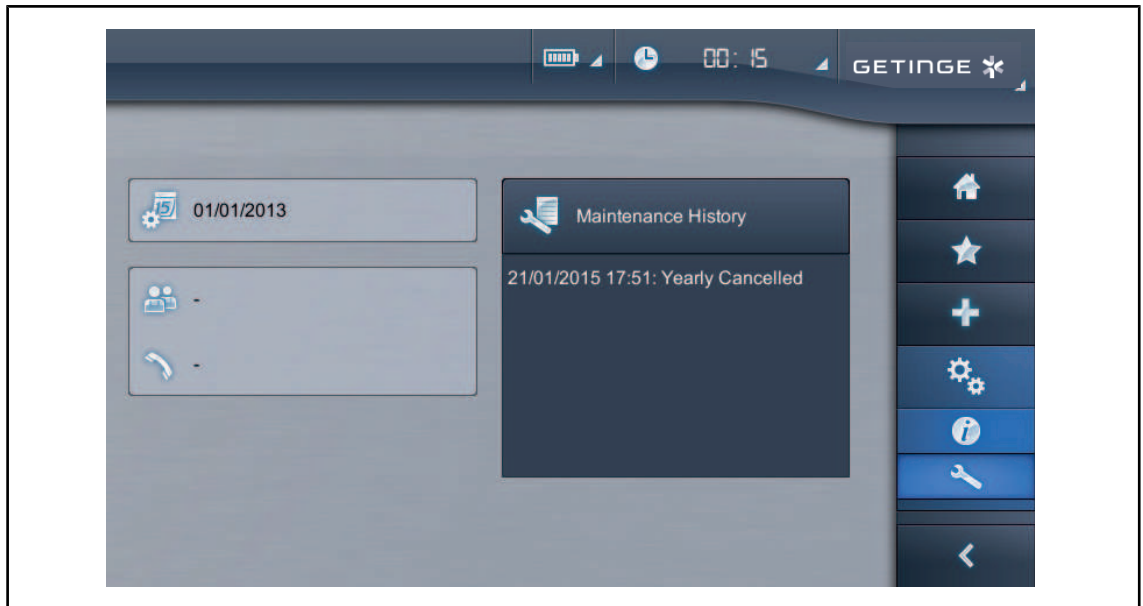


Fig. 20: Maintenance Page

- When button [3] is pressed, **the maintenance screen** displays the following information: installation date; name of the local Getinge contact; telephone number of the local contact.

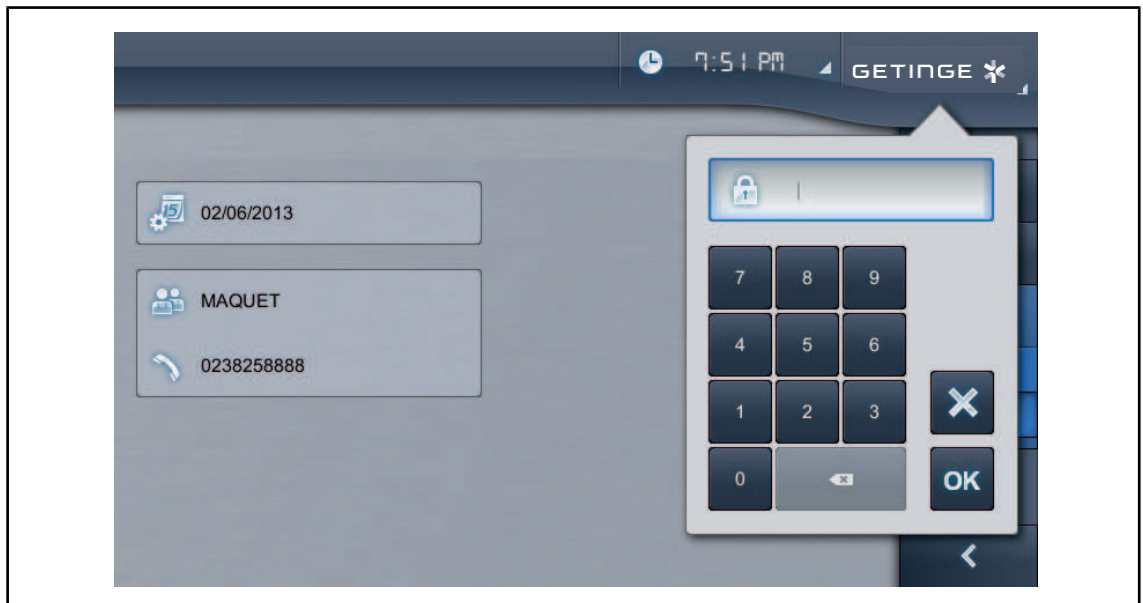


Fig. 21: Entering the password

- **Important:** This information must be entered by a Getinge technician when the touchscreen control panel is installed. To do this, press the triangle beneath the Getinge logo:
- Enter the password, **8311**.

4.3.3.6 Resetting and restarting the touchscreen control panel

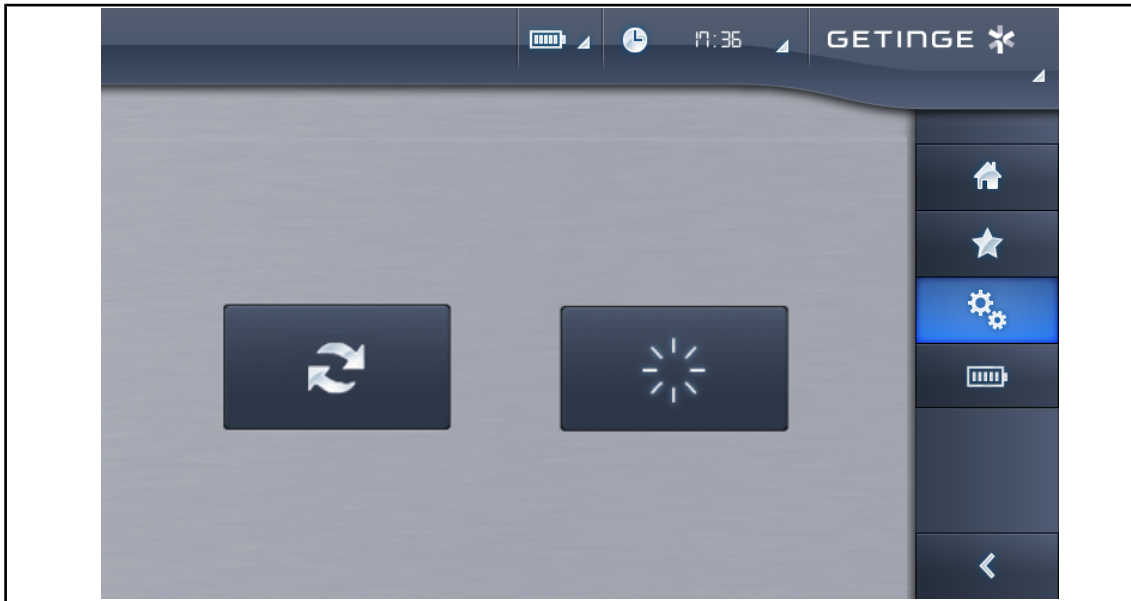






Fig. 22: Resetting and restarting the touchscreen control panel

	<p>Reset (after change of tools)</p>	<ul style="list-style-type: none"> Press this button to display the tools present and their status after change. When the device starts up, always perform a reset to detect all installed lights. <i>Note: The automatic numbering of the lightheads depends on the power supply's connections:</i> <ul style="list-style-type: none"> – LV1-28 V DC: light No. 1 – LV2-28 V DC: light No. 2 If the tools are not all powered down before you perform the reset, a window opens to allow you to turn them off: <div style="display: flex; justify-content: space-around;">   </div>
	<p>Restarting the screen</p>	<ul style="list-style-type: none"> Press to restart the touchscreen control panel if necessary.



NOTE

If a camera or the LMD unit is installed, the touchscreen control panel automatically detects the change of tool or accessory (even if not visible) and a confirmation reset window opens. The user can then choose whether or not to reset the system after switching off the tools.

- If the automatic reset (readdressing) does not work correctly, the lighthouse addresses can be set manually (see below):

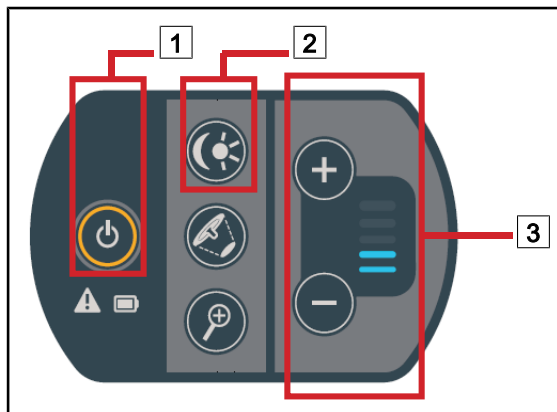


Fig. 23: Resetting the system using the light-head keypad

- Turn off the lighthouse(s).
- Press the **On/Off** 1 and **Standard mode/ Ambient lighting mode** 2 buttons and hold them down for approximately 10 seconds, until one of the five LEDs 3 on the bargraph is lit.
 - Each LED represents a different address.
- Press a LED on the bargraph to modify the address.
- Press the **On/Off button** 1 to confirm and exit readdressing mode.

4.3.4 Conducting backup tests

4.3.4.1 From the touchscreen control panel

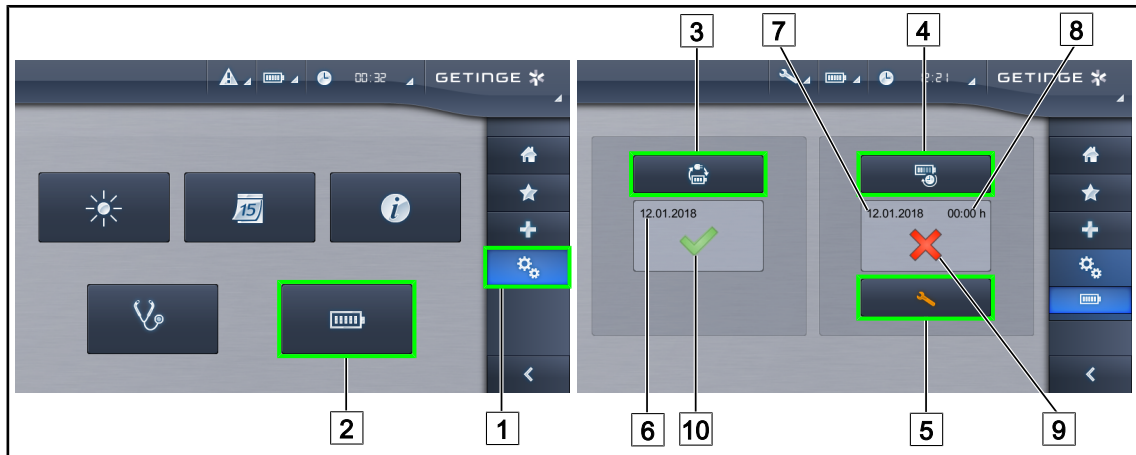


Fig. 24: Battery tests

Running a battery backup test

1. Turn off the light.
2. Press **Settings** [1] in the menu bar.
3. Press **Battery tests** [2].
 - The battery tests page is displayed.
4. Press **Battery backup test** [3] to start the test.
 - The date of the most recent battery backup test [6] is updated and a green tick [10] is displayed if the test was successful. If the test fails, however, a red cross [9] and a **Maintenance information** [5] button are displayed.
5. If the test fails, press **Maintenance information** [5] 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 **Settings** [1] in the menu bar.
3. Press **Battery tests** [2].
 - The battery tests page is displayed.
4. Press **Battery lifetime test** [4] 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 [10] is displayed if the test was successful. If the test fails, however, a red cross [9] and a **Maintenance information** [5] button are displayed.
5. If the test fails, press **Maintenance information** [5] to access the maintenance information page, and then call the Getinge technical service department.



NOTE

The battery lifetime test can be stopped at any time by pressing the red cross [9].

4.4 Mechanical inspections

4.4.1 Visual inspections

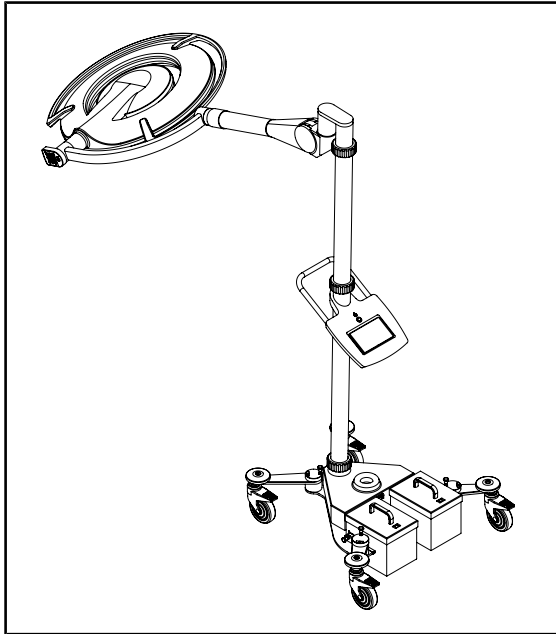


Fig. 25: Checking the Maquet Rolite

- Check the stability of the light.
- Check for any loose covers on the light.
- Check the configuration for corrosion.
- Check the configuration for any chipped or missing paint.
- Check that the rings on the bottom and top poles and the spring arm are securely fastened.
- Check that the light handles easily.
- Check the locking of the rear castors
- Check that all visible screws are tightly fastened

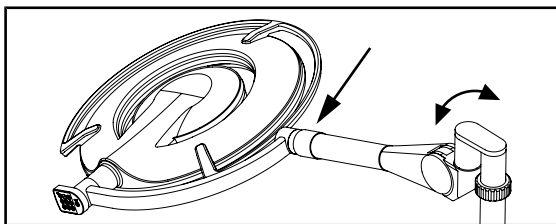


Fig. 26: Checking the spring arm

- Check that the sliding ring is in place on the spring arm and held by its mounting screw.
- Check that the metal or plastic half-rings on the spring arm are properly positioned and not loose.

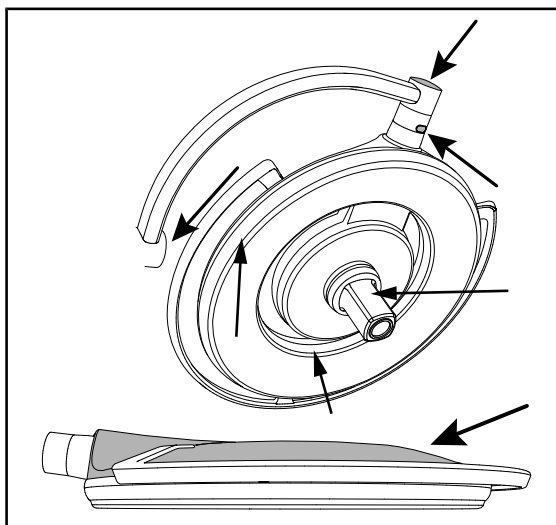


Fig. 27: Checking the condition of the lighthouse

- Check that the silicone covers, seals and lighthouse cover are not loose.
- Check the condition of the underside (no scratches or cracks).
- Check that the lighthouse handle mount is firmly attached.
- Check the fastening of : Sterilisable handle, camera, LMD.

4.4.2 Checks

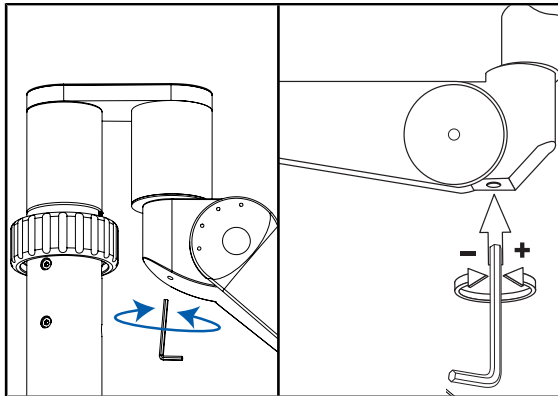


Fig. 28: Checking the balance of the spring arms

Check that the spring arms are balanced in all positions.

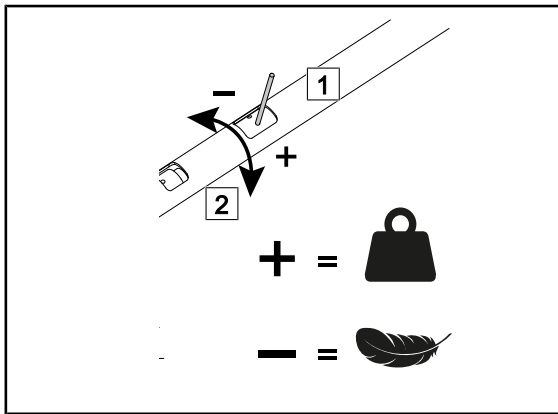


Fig. 29: Checking the balance of the spring arms

Check that the spring arms are balanced in all positions.

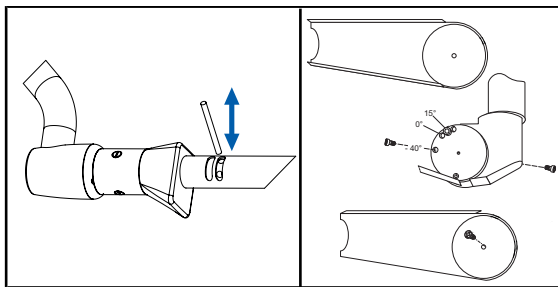


Fig. 30: Checking the vertical end-stop

Check the vertical end-stop on the spring arm.

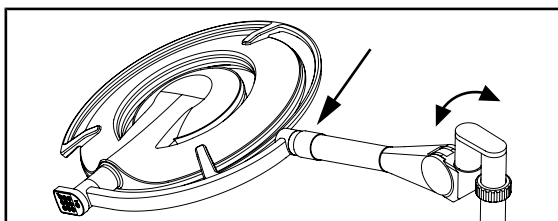


Fig. 31: Checking the horizontal end-stop

Check the horizontal end-stop on the spring arm.

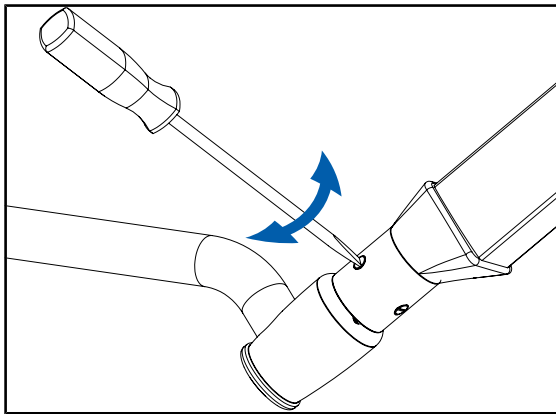


Fig. 32: Checking the adjustment of the brakes

Check that the brakes are properly adjusted on the spring arm for the single fork version.

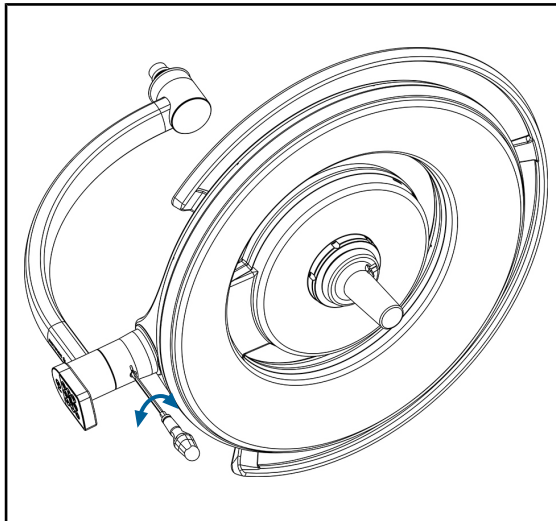


Fig. 33: Checking the lighthouse brakes

Check that the lighthouse brakes are tightly fastened.

4.5 Electrical inspections

4.5.1 Electrical checks

- Check the mains lead connection to the Maquet Rolite base.
- Check the installation and locking of the batteries.

4.5.2 Functional tests

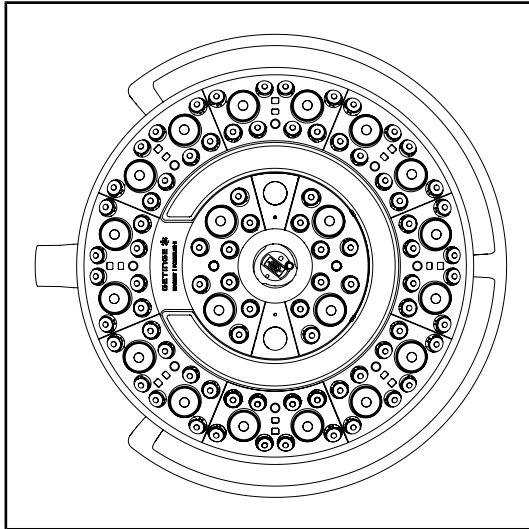


Fig. 34: Checking the LEDs

- Check that the LEDs operate correctly:
 1. Press the ON/OFF button on the lighthouse control keypad to turn on the light.
 2. Select the largest light field diameter, such that all LEDs are lit.
 3. Vary the illumination of the lighthouse from the minimum to the maximum.
 - The light intensity varies depending on the selected level.
 - All the LEDs operate.

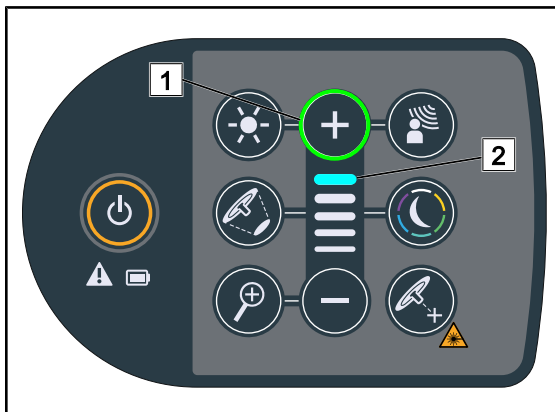


Fig. 35: Check of functions and BOOST mode

- Check that Boost mode can be entered correctly:
 1. When the light intensity level is at 100%, press and hold the “Plus” button **1** until the last LED on the level indicator **2** starts flashing.
 - Boost mode is now enabled.
- Check that Endo mode can be entered correctly (lighthouse keypad).
- Check that AIM mode can be entered correctly (lighthouse keypad).
- Check all lighthouse keypad functions.



Fig. 36: Checking the touchscreen control panel

Check that the touchscreen control panel and functions operate correctly.

Ex: Adjusting the light field diameters, etc.

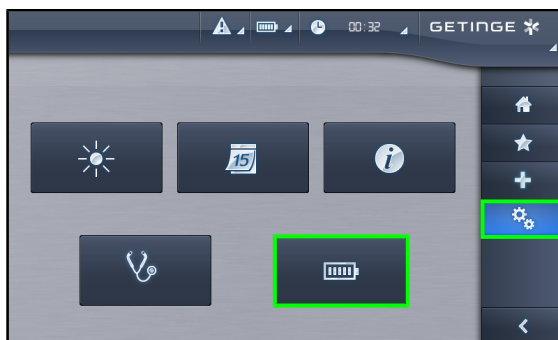


Fig. 37: Checking the battery mode

Switch over to battery mode and back to mains.



Fig. 38: Checking the battery charge indicator

Check the battery charge indicator in the status bar of the touchscreen control panel.

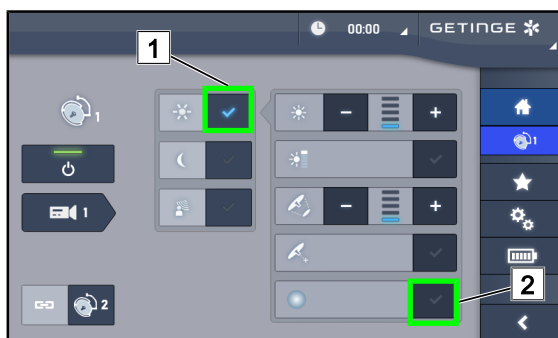


Fig. 39: Checking the Comfort Light mode

Test the Comfort Light mode* (only on Maquet PowerLED II)

Prerequisites:

- Illumination adjustment mode [1] is enabled.
- 1. Press **Comfort Light mode** [2]
 - The button is lit blue and the Comfort Light mode is enabled on the light-head(s) concerned.



NOTICE

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

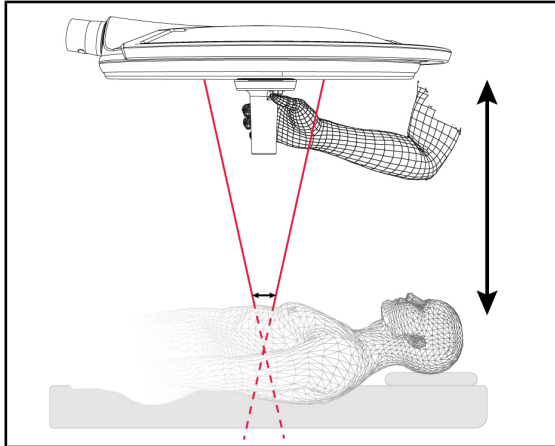


Fig. 40: Checking the Laser mode

Test the Laser mode (only on Maquet PowerLED II)

1. Press the **Laser** button and hold it until it flashes.
 - The light output level is reduced and two laser dots appear for 20 seconds.
2. Position the lighthead so as to bring the two dots closer together.
 - The lighthead is thus at the optimum distance from the zone to be illuminated.

4.6 Hydraulic inspections

4.6.1 Visual inspections

Not applicable to this product.

4.6.2 Checks

Not applicable to this product.

4.7 Optical inspections

4.7.1 Visual inspections

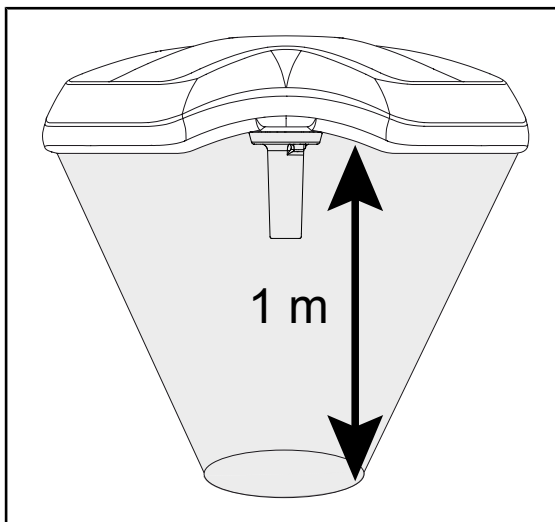


Fig. 41: Light field diameter

- Measure the illumination at the centre of the light field, at a distance of 1 metre, in small light field mode, with the dimmer set at “Maximum” or in Boost mode.
- Measure the illumination value using a lux-meter.

4.8 Electrical safety tests



NOTE

Electrical safety measurements must be carried out using an IEC 62353-compatible electrical safety tester.

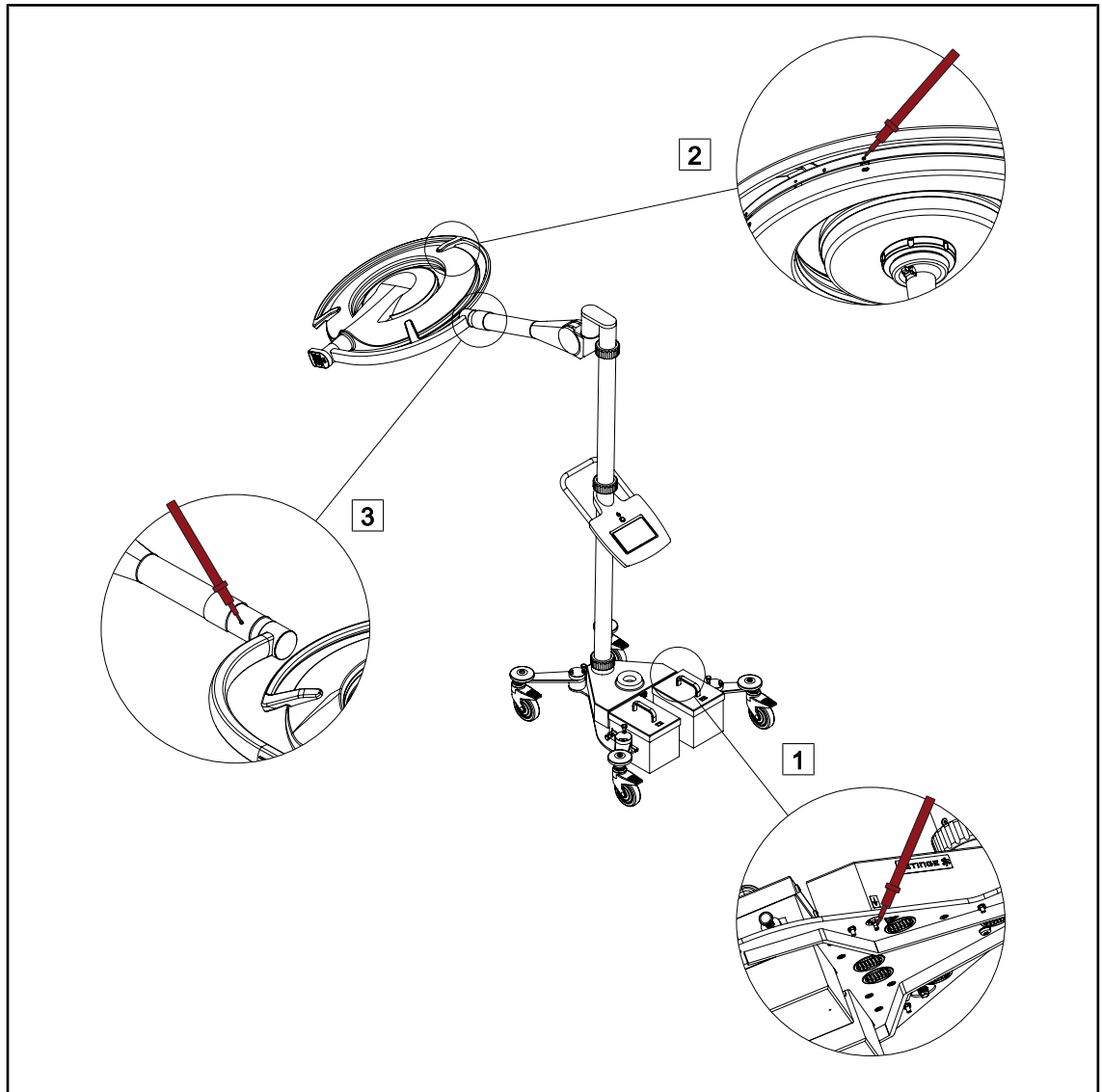


Fig. 42: Electrical safety tests

- Earth continuity should be measured between:
 1. Point 1, protective earth (PE).
 2. Point 2 at the end of the spring arm.
 3. Test the continuity between point 2 and point 3.
 - The earth resistance should be less than or equal to 300 mΩ
- Check the condition and connection of the power cord
- Check the installation and locking of the batteries.

5 | **Recording the inspection** Service protocol and tools used

5 **Recording the inspection**

5.1 **Service protocol and tools used**

5.1.1 SW Service Protocol PM OR Lights Rolite PowerLED II-A-EN

SW Service Protocol
Preventive maintenance



Surgical Lighting
Maquet Rolite



1 Customer

Name of facility	Job No.

2 Product

Configuration Part No.	Configuration Serial No.	Description
Lighthouse 1 Part No.	Lighthouse 1 Serial No.	Description
Installation Date	Location (department, operating room name or number)	

3 Periodic replacement

To ensure safety and performance please follow the below recommendations.

Items	Frequency	Replaced	Not replaced	N/A
All brakes	every year			
Safety segment of the spring arm	every 6 years			
Batteries	every 3 years			

Please refer to the maintenance manual for more detailed instructions.

4 Other Parts replaced or need replacing

P/N	Description	Qty	Replaced	Need replacing

5 Calibrated tooling

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

6 Lubrication

	Compliant	Non-compliant	N/A
Lubrication of the lighthouse bracket axles			
Lubrication of the slip rings			

5 | Recording the inspection

Service protocol and tools used

7 Mechanical checks

	Compliant	Non-Compliant	N/A
Check the stability of the light.			
Check that the covers and metal or plastic tabs of the spring arm are firmly in place			
Check the horizontal and vertical stop on the spring arms			
Check the balancing of the spring arm			
Check the tightness of the rings on the bottom and top poles and on the spring arm			
Check the positioning of the snap rings (replace every 6 years) or stop screws on the spring arm			
Check that the snap ring is in position and that its mounting screw is tight.			
Check that the lighthouse covers and seals are firmly in place.			
Checking the adjustment of the lighthouse brake			
Check that the handle mount is firmly attached.			
Check the locking on the sterilisable handle			
Check that the light handles easily.			
Check the general appearance of the device (check for impacts, scratches, corrosion, chipped paint, etc.)			
Check the movement of the mobile base			
Check the locking of the rear castors			
Check that all visible screws are tightly fastened			

8 Electrical checks

	Compliant	Non-Compliant	N/A
Check the power cord connection			
Check the installation and locking of the batteries.			

9 Optical assessment

Illumination	Acceptable values (klx)	Measured value (klx)	Compliant	Non-compliant	N/A
Ec Max Lighthouse 1	98 < Ec < 160				

Measure the illumination at the centre, at 1 meter, in small light field (with dimmer at max setting or in Boost mode).
The IEC 60601-2-41 standard indicates the limits between 40 000 lux minimum & 160 000 lux maximum.
The minimum acceptable value was calculated based on the nominal value - 30%.

10 Electrical safety tests (IEC 62353)

	Limit (mΩ)	Value measured (mΩ)	Compliant	Non-compliant	N/A
Lighthouse protective earth continuity	≤ 300 mΩ				

Lighthouse continuity test					
----------------------------	--	--	--	--	--

If available, attach test records to this report.

11 Functional tests

	Compliant	Non-compliant	N/A
All LEDs are working properly			
ON / OFF (lighthouse keypad)			
Illumination level (lighthouse keypad)			
BOOST mode (lighthouse keypad)			
ENDO mode (lighthouse keypad)			
AIM mode (lighthouse keypad)			
Light field diameter adjustment			
Using the camera			
Touchscreen control panel			
Switch to battery mode and then return to mains power			
Battery charging indicator			
Laser positioning assistance (PowerLed II only)			
Comfort Light mode (PowerLed II only)			
Change mode of the three TK colour temperatures and Volista NIR Boost (optional)			

5

Recording the inspection Service protocol and tools used

12 Cleaning

	Yes	No
Clean and degrease the device		

13 Final assessment

Device fully operational.	
Free from direct risk but deficiencies detected. Possibility of short-term correction.	
Device shall not be used until all deficiencies are corrected.	
Device no longer safe. Taking out of service is recommended.	

Comments

14 Processed by

Name	Date			Signature
	<i>DD</i>	<i>MM</i>	<i>YYYY</i>	

15 Facility (Required)

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

Notes

*MAQUET ROLITE, POWERLED II, VOLISTA, VOLISTA VISIONIR, AIM, COMFORT LIGHT, LASER POSITIONING, FSP, POWERLED, ROLITE, MAQUET, GETINGE and GETINGE GROUP are trademarks or registered trademarks of Getinge AB, its divisions or its subsidiaries.


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