



# MP 3020

INSTALLATION  
MANUAL







EXPERIENCE AND INNOVATION  
SINCE 1948

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## 1 SYMBOLS USED

### 1.1 SYMBOLS USED IN THE MANUAL

|  |                  |
|--|------------------|
|   | <b>WARNING</b>   |
| The paragraphs marked with this symbol contain instructions that must be carefully followed to avoid damaging the device, harming the operator or the patient. |                  |
|   | <b>CAUTION</b>   |
| These instructions warn you that you must pay attention to avoid situations that could damage the device.  |                  |
|   | <b>FORBIDDEN</b> |
| This icon highlights what you should not do to avoid damaging the device.  |                  |
|   | <b>NOTES</b>     |
| This icon supplies information that allows you to use the device more efficiently.   |                  |

### 1.2 GENERAL STANDARDS AND MAIN WARNINGS



|   |  |
|---|--|
|    | <b>General Warning</b>                             |
| The device can be installed in a medical system (unit), but also on specific applications to ceiling, floor or wall. The device can be powered both by the unit and by a power supply connected directly to the mains. See the specific installation paragraph.<br>The device must never be modified without written authorization of FARO S.p.A.<br>For maintenance only original FARO's spare parts are allowed. Failure to comply with this warning will immediately make decay the warranty and the conformity of the product to international regulations and directives on Medical Devices.   |  |
|    | <b>Warnings against electrical danger and fire</b> |
| Installation of the device must only be carried out by qualified personnel.<br>The light must be installed on a specific control and power supply device, such as units, or with an electrical system that meets standard IEC 60364-1 and "national installation regulations for electrical systems in premises for medical use".<br>When installed with ceiling, floor or wall applications the device must be installed with an omnipolar separation device from the mains and compliant with Standard IEC 61058-1. This separation device must be approved to withstand 4 kV of transient voltage.<br>Installation and maintenance of device conformity with the standard IEC 60601-1 is the responsibility of the installation technician or the manufacturer of the medical system / unit).<br>Check that the power supply voltage, indicated on the main plate, corresponds to the mains voltage. |  |
|    | <b>Warning for danger of explosion</b>             |
| The device is not suitable for installation in environments with the presence of flammable gas or rich of oxygen.   |  |

### 1.3 STORAGE AND USE: ENVIRONMENTAL PROVISIONS

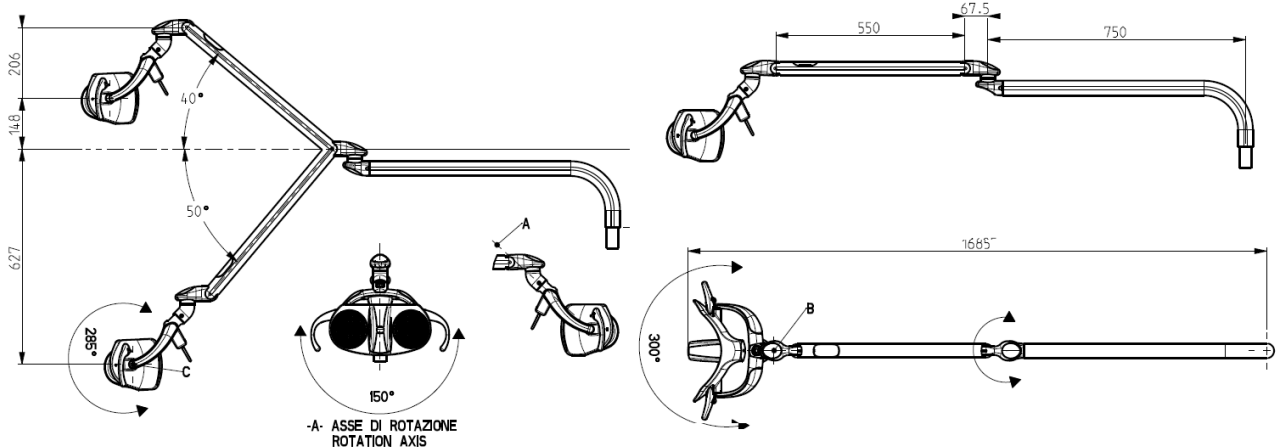
The device must be used in the following environmental conditions:

- Temperature from 10° to 40°C
- Max altitude: 2000 m
- Relative humidity from 30% to 75%

## 2 DEVICE INSTALLATION

|  |                                       |
|--|---------------------------------------|
|   | <b>Warnings for electrical danger</b> |
| The device must be installed by specialist technicians.<br>On installation, the power supply must always be disconnected.<br>Refer to the wiring diagrams in the manual.<br>Check the main plate data before installation  |                                       |
|   | <b>Note for installation</b>          |
| The power supply cable on the complete light is supplied without any connector or terminal to allow connection according to the specifications of the combination or application.<br>The functionality and safety of the light does not depend on the polarity of the power supply current. Therefore inversion of the power supply cables will not pose a risk of malfunctioning. |                                       |

**2.1 DIMENSIONS**



**2.2 GENERAL ELECTRICAL REQUIREMENTS**

The requirements for correct installation for any application (unit, wall, floor or ceiling) are the following:

| Power supply                                    | PowCer cable  | Type of power supply and safety requirements   | Classification                              | Compliance with IEC 60601-1   |
|---|---|--|---|---|
| Complete light version<br>17-24 Vac<br>50/60 Hz | 2 x 0.5 mm <sup>2</sup><br>300 V<br>105°C<br>PVC insulation diameter<br>insulation 1.85 mm<br>Only use certified terminals and connectors with resistance to flame VW-1 or similar. | Transformer complies with IEC/EN 60601-1 third edition with protection of phase of secondary with appropriate fuse:<br>• T1.6AL 250V<br>Requirements:<br>• Output: 24 V ac;<br>• Power: min 26 VA<br>• Dielectric strenght > 4000 V.<br>• 2MOPP between primary and secondary<br>• Thermal protection<br>In case of permanent application see note 1 | Component built-in part of a Medical Device | The medical system must be declared compliant with IEC/EN60601-1 by the installation technician or manufacturer. Note for the Service Eng.: assure that the combined version on which the light is installed is certified to install the complete light.<br>Note 1:<br>• the fuse must be placed on the phase and not on the neutral.<br>• The lamp must be installed with a multipolar device to separate it from the supply network, meeting the requirements of IEC/EN 61058 standards.<br>• This separation device must be approved to withstand 4KV of transient voltage<br>• A green status light shall be inserted to indicate that the lamp is powered. |
| Complete light version<br>25-33 V DC            |   | Power supply conform to IEC/EN 60601-1 third edition with one pole protected by appropriate fuse:<br>• T1,25A L 250V<br>Minimum requirements:<br>• Output: 32 Vdc<br>• Power: min 15 VA;<br>• Dielectric strenght > 4000 V;<br>• 2 MOPP between primary and sec.<br>Continuous protection from short circuit or overcurrent                          |   |   |

Tab 1 – Requirements for electrical connection and compliance with IEC/EN 60601-1.

**2.3 UNIT INSTALLATION**

**2.3.1 Mechanical connection to unit**

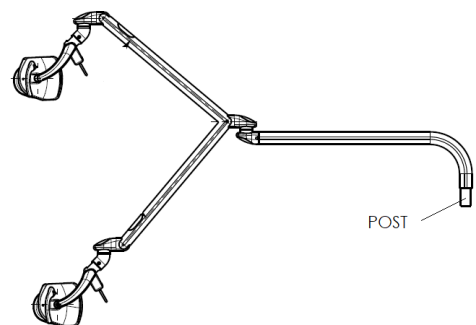
Fit the Post into the seat of the unit dedicated to the Luminaire. The Post is designed with the following tolerance: F7  
The seat of the unit must be of the following tolerance grade: H7

Lubricating grease must be applied to the surface of the post before the connection is done.

Faro suggests the following grease to be applied:

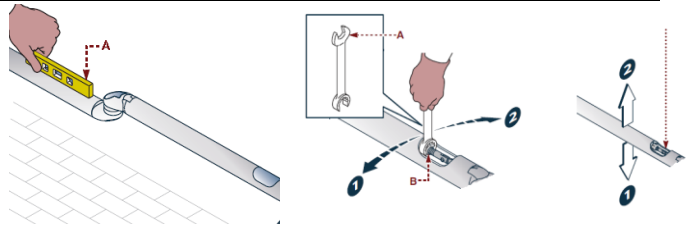
**Molykote 111 silicon Grease.**

With a digital level, ensure the connection element on the unit is perfectly parallel to the ground (max 2°)



Take care that the fixed arm is parallel to ground in each position.

Check the light stays balanced in all positions and no drifting of the swivel arm occurs. If necessary, adjust the force on the spring by screwing or unscrewing the nut (B) with the suitable tool until the arm is balanced.



**2.3.2 Power Supply connection**

Check the output voltage from power supply according to table 1.

Connect the power supply cable according to the specifications outlined in Tab. 1.

Color specification for the cables:

- Neutral: blue
- Phase: brown

The power supply cable on the complete light is supplied without any connector or terminal to allow connection according to the specifications of the combination or application.

The functionality and safety of the light does not depend on the polarity of the power supply. Therefore inversion of the power supply cables will not pose a risk of malfunctioning.

Specification of the Power Supply Cable

- 2 x 0.5 mm<sup>2</sup> (AWG 20, 300 V rating, 105°C, VW-1 flame rate)
- PVC insulation
- Diameter of insulation 1.85 mm

Only use certified terminals and connectors with resistance to flame VW-1 or similar.

Take care that the device is protected with the fuse as recommended in Tab 1.

**2.3.3 Remote Cable connection**

Standard remote cable length 4 m

Maximum range from arm on the side of the pin:

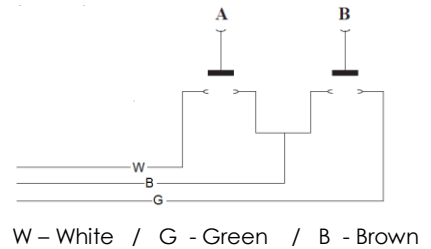
2,5 m.

The remote cable must not be lengthened during installation.

Any operation done on the remote cable could affect "EMC" performance.

Connect the cable to two buttons (A and B) with normally open contact

(not supplied) according to the following diagram.



|  |   |
|--|---|
|  | <p><b>Warnings for electrical interferences causing malfunctioning</b></p> <p>if the remote cable terminals are not connected to the unit, always insulate (i.e. with insulation tape) the terminals.</p> |
|--|---|

| Function                           | Button | Operazion              |
|------------------------------------|--------|------------------------|
| On - Off                           | A      | Press and release      |
| Lux min                            | B      | Press and release      |
| from Lux min, back to standard Lux | B      | Press and release      |
| Dimming                            | A      | Press and keep pressed |

**2.3.4 Auto-on setting**

To activate or deactivate Auto On Setting proceed as described below:

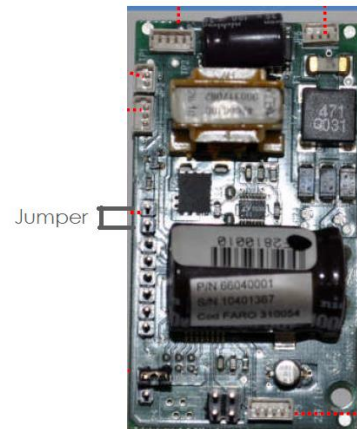
Switch off the lamp and disconnect the power supply from the unit.

Put the Jumper as showed in the picture on the right.

Connect the power supply and turn on the lamp.


With the lamp turned on, pull out the jumper

To deactivate the Auto-on setting, repeat the procedure.




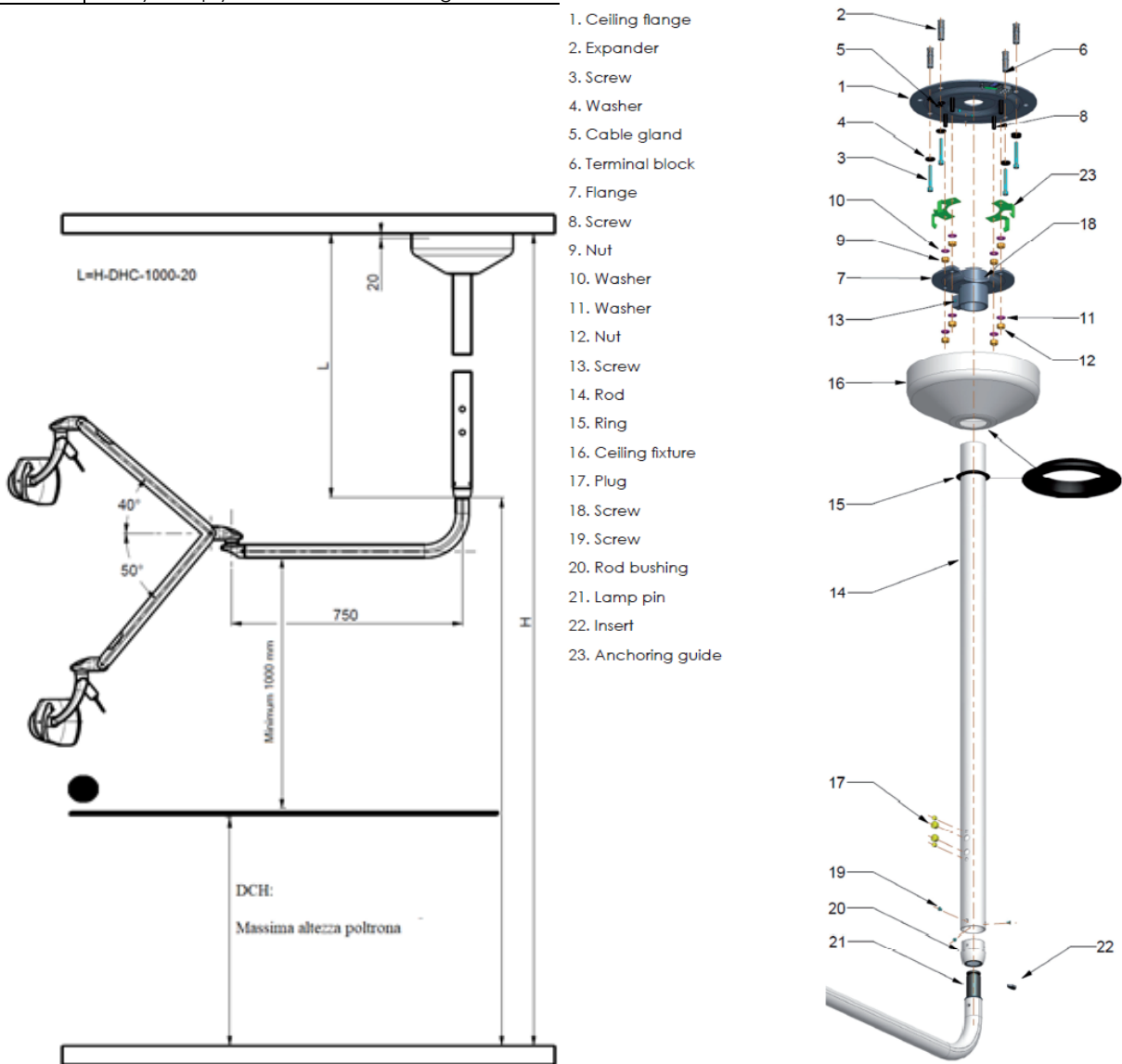
## 2.4 COMPLETE LIGHT CONNECTION TO THE CEILING

For the installation of such application please make reference to the dedicated sections of this manual. Connect the power supply cable according to the specifications outlined in Tab. 1. The applications are not supplied with the light.

|   |  |
|---|--|
|  | <p><b>Warnings for electrical danger and suspended masses</b></p> <ul style="list-style-type: none"> <li>- The device has to be installed by specialized technicians only</li> <li>- The light has to be installed with FARO applications only.</li> <li>- The light is supplied with rotation limit switch between the fixed and the swivel arm.</li> <li>- The switch limits must not be passed over or forced.</li> </ul> |
|---|--|

### 2.4.1 Ceiling mounting with Faro applications

|   |   |
|---|---|
|  | <p><b>Warnings for electrical danger and suspended masses</b></p> <p>The device must be installed by specialized technicians<br/>         The power supply in the room where the fitting must be installed must be always switched off.<br/>         Before starting the installation take care that the ceiling is suitable to bear the load of the application and light.<br/>         The anchor bolts provided with the application must be used only with the following base materials: concrete, natural stone.</p> <p>Maximum load applicable for 60 seconds: 70 kg<br/>         See tab 1 for the electrical requirements of the power supply.<br/>         Strictly comply with the minimum heights shown below.</p> |
|---|---|

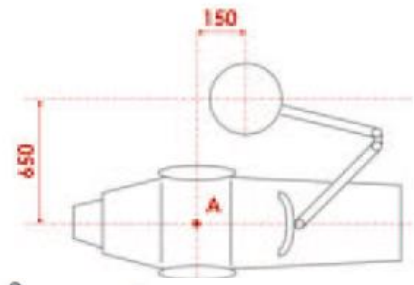


**2.4.2 Installation procedure**

**A** After having fixed as reference point the centre of the chair (A), install at a distance of 650mm and 150mm, according to the directions given in the picture.

**B.** Unfit the flange (7) by removing the nuts (12) and washers (11).

**C.** Using the flange (1) as a guide, drill 4 holes in the ceiling Ø14mm. Fit the 4 expanders (2) in the holes.



|  |                                      |
|--|--------------------------------------|
|  | <b>Warnings for suspended masses</b> |
|  | Safety Component: 2, 3 and 4         |

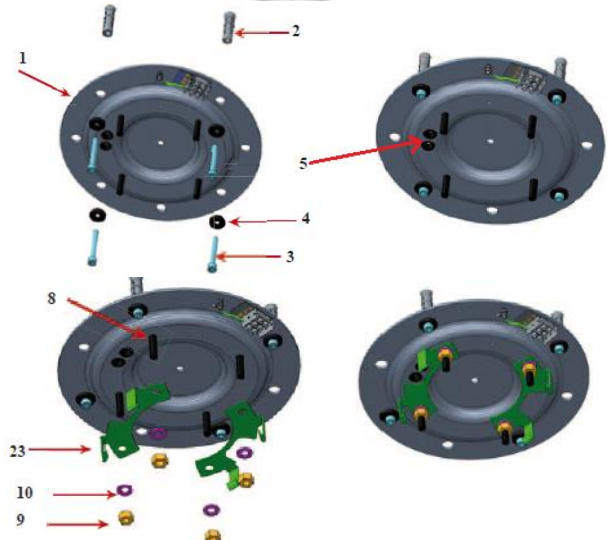
**D.** Take the flange (1). Pass the power cable through the cable gland (5), then push the flange (1) to the ceiling; do not choke the cable between the flange (1) and the ceiling. Secure the 4 screws (3) and washers (4) in the the 4 holes. Lock with the special wrench (installation accessory) the screws (3).

**E.** Connect the power cable to the terminal block (6)

**F.** Fit the 2 guides (23) to the screws (8) and fix them with the nuts (9) and washers (10)

**G.** Calculate the proper height of the column (14), according to the Formula:  $L=H-DHC-1020$  mm.

Cut the exceeding column (14) part on the side were no lateral holes are present

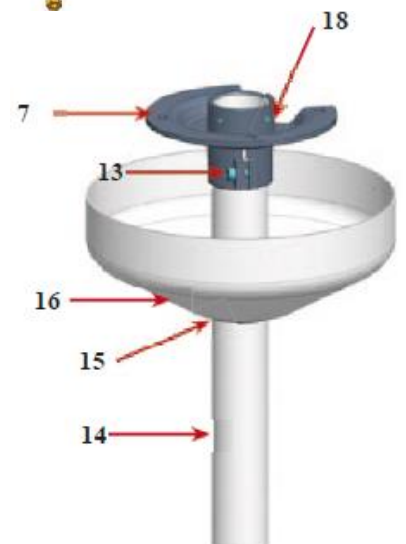


|  |   |
|--|---|
|  | <b>Warnings for suspended masses</b>  |
|  | <b>H.</b> Insert the column (14) in the flange (7) and make the marks on the column (14) the position of the holes on the flange (7). Remove the column and drill two Ø 8 holes at the marked points. |

**I.** Fit on the column (14) the ring(15) at about 300 mm height (it is only temporary position to allow the assembling)

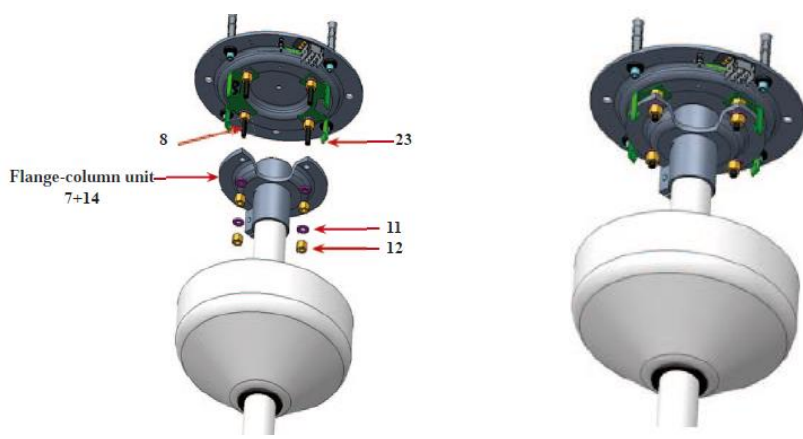
**J.** Insert the ceiling light support (16) on the column (14)

**K.** Fit the column (14) in the special bore of the column fixing flange (7)

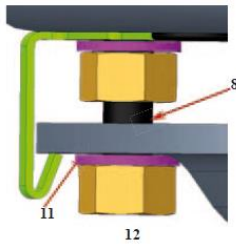


|  |  |
|--|--|
|  | <b>Warnings for suspended masses</b>   |
|  | <b>L.</b> Lock the screw (13) and the two screws (18) with hexagonal spanners (installation accessory). Tighten sturdily the screw (13) and make sure the screws (18) have passed through the bores on the column (14) |

**M.** Hook the unit assembled [column flange (7) + column (14)] to the fixing guides (23), fitting the 4 holes of the flange (7) to the screws (8).



**N.** Screw (without locking) the nuts (12) and the remaining washers (11) on the screws (8) of the ceiling flange (1)

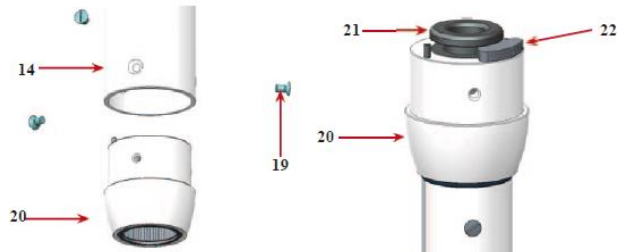


**O.** Unscrew the three screws (19) of the column (14) and remove the bushing (20)

**P.** Insert the bushing (20) on the lamp pin (21)

**Q.** Insert in the pin (21) groove the key switch (22)

|  |                                      |
|--|--------------------------------------|
|  | <b>Warnings for suspended masses</b> |
|  | SAFETY COMPONENT:<br># 22            |

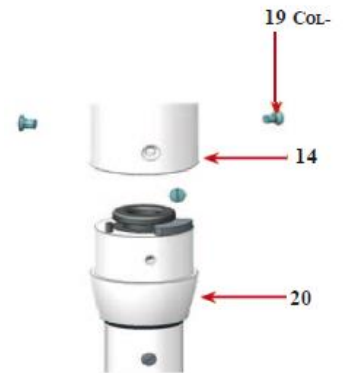


**R.** Slip - from the top - inside the column (14) a traction cord.

**S.** Connect the lamp conductor to the traction cord.

**T.** Fit the lamp on the column (14) and fix it with the three screws (19); make sure the bores of the bushing (20) match the screws seat on the column (14) and tighten. Simultaneously pull the traction cord to push out the conductor of the lamp from the column fixing flange (7) of about 200 mm.

|  |                                      |
|--|--------------------------------------|
|  | <b>Warnings for suspended masses</b> |
|  | SAFETY COMPONENT:<br># 19 (3 PCS)    |

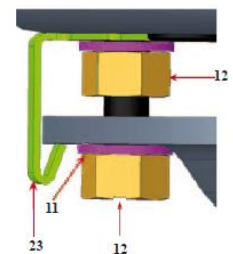


**U.** Connect the lamp conductor to the terminal board (6) (see electrical diagrams).

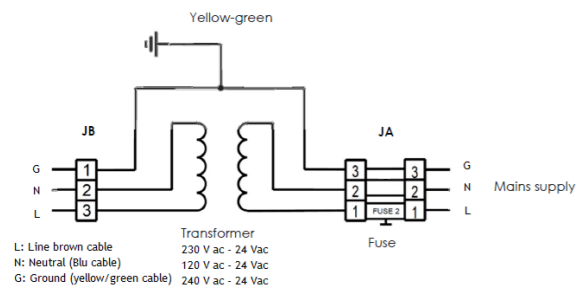
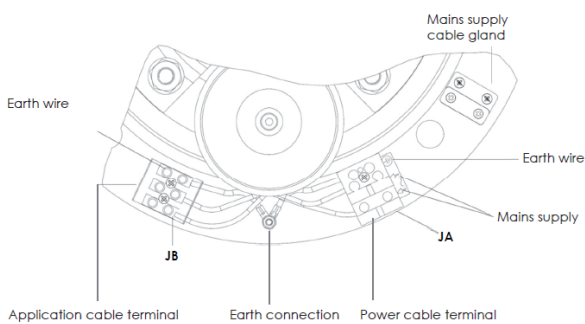
**V.** Check the perpendicularity of the column by acting on the nuts (9).

**W.** Tighten the nuts (12) and washers (11) to fix the flange (7), making it independent of the fixing rail (23).

**X.** Adhere the ceiling light (16) to the ceiling, pushing it against the ring (15).

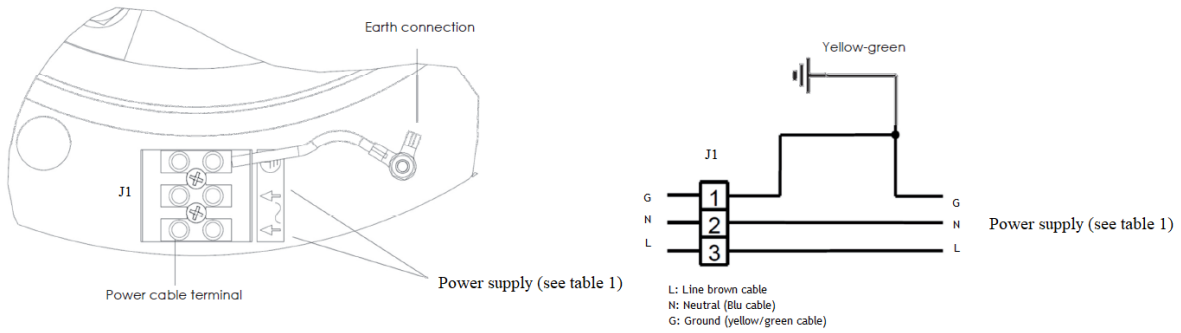


**2.4.3 Electrical drawing – ceiling mounting with transformer**





**2.4.4 Electrical drawing – ceiling mounting without transformer**



**2.5 WALL MOUNTING**

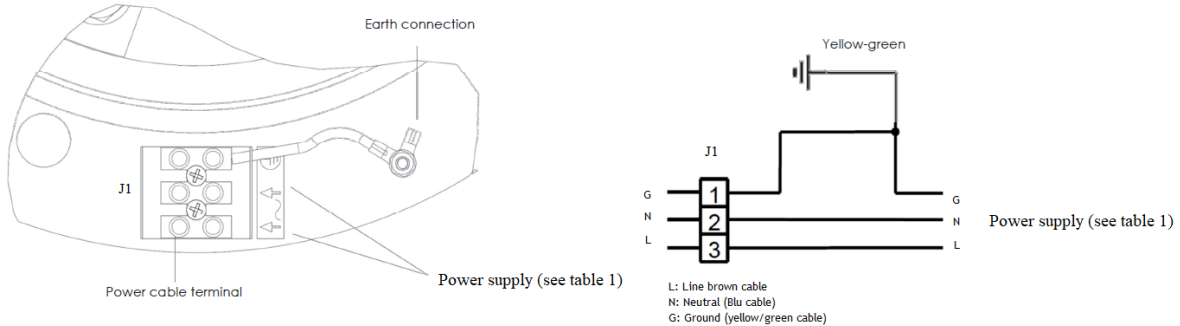
|  |   |
|--|---|
|  | <p><b>Warnings for electrical danger and fall of suspended masses</b></p>   |
|  | <p>The device must be installed by specialized technicians<br/>                 The power supply in the room where the fitting must be installed must be always switched off.<br/>                 Before starting the installation take care that the ceiling is suitable to bear the load of the application and light.<br/>                 The anchor bolts provided with the application must be used only with the following base materials: concrete, natural stone.<br/>                 Maximum load applicable: 70 kg<br/>                 See table 1) the electrical requirements of the power supply.<br/>                 Strictly comply with the minimum heights shown below.</p> |

|  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Cap</li> <li>2. Screw</li> <li>3. Wall application</li> <li>4. Wall plugs</li> <li>5. Electrical connector</li> <li>6. Connector cover</li> <li>7. Carter</li> <li>8. Screws</li> <li>9. Washer</li> <li>10. Cable fairlead</li> </ol> |  |
|  |  |

- A. Once the fastening point has been established with reference to the center of the chair (See fig.A-B), make three holes on the wall of diameter D 14 in correspondence with the holes in the wall application (3), paying attention to the perpendicularity between hole and wall.
- B. Insert the three wall plugs (12) into the holes made in A the screws (2) with the special hexagonal key (support accessories), taking care not to crush the wire between the wall application (3) and the wall itself.
- C. Apply the three Caps (4) to the holes in the wall application (3).
- D. Unscrew the screw (8). Remove the cover (7), insert the lamp in the ceiling application by greasing the pin.

- E. Connect the lamp wires to the terminal Electrical connector (5) (see wiring diagram below) including the grounding wire.
- F. Connect the wires coming out of the wall to the terminal board, in the case had been previously walled up. In the absence of this precaution, the connection it must be carried out with an external flying cable, to be introduced into the cable gland (10).
- G. Mount the cover (7) using the screws (8).

### 2.5.1 Electrical drawing – wall mounting without transformer



## 2.6 FLOOR MOUNTING

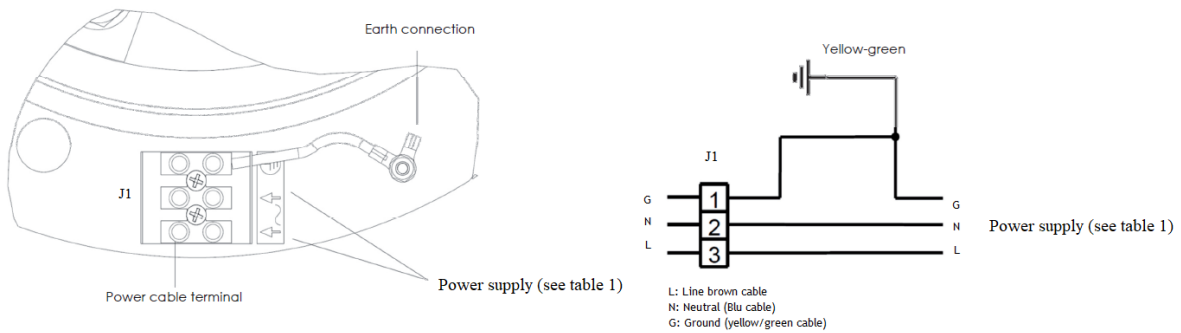


**Warnings for electrical danger**  
**Warning for danger of suspended masses**

- NB1. The device must be installed by specialized technicians
- NB2. The power supply inside the room where the installation is carried out must always be switched off.
- NB3. Before proceeding with the assembly operations it is necessary to make sure that the floor is able to support the application. The authorized materials are concrete and natural stone. The wall plugs to be used are those supplied or equivalent.
- NB4. Maximum applicable load: 70 kg
- NB5. Install in rooms with an electrical system that complies with the national regulations in force on medical premises (see §3.2.1 for general description)
- NB6. The Lights must be powered and connected according to requirements of table 1).  
 The resulting medical system must be declared in accordance with IEC / EN 60601-1 by the installer

|  |   |  |
|--|---|--|
| <p>.Once the fixing point has been established with reference (a) the center of the chair, drill four holes diameter D14 in the floor in correspondence with the holes in the floor support (13).</p> <p>A. Prepare the floor support (13) by passing the washer (7) and the screw (6);</p> <p>B. screw the wall plugs (12) onto the screws (6) for a few turns, pass the supply wire through the cable fairlead (11)</p> <p>- Insert the four wall plugs (12) into the holes and lock the screws (6) using the appropriate hexagonal key, taking care not to damage the wire between the floor support (13) and the floor itself.</p> <p>C. Apply the four caps plugs (5) to the holes in the floor support (13).</p> <p>D. Unscrew the screws (8) and remove the cover plate (9)</p> <p>E. Connect the power supply wire to the terminal connector (10), including the ground cable.</p> <p>F. Place the column (4) to the floor support (13), during the fixing, check the perpendicularity of the column.</p> <p>G. Place the bush (2) to the column (4) with the three screws (3), taking care to orient the holes in the bush (2) in correspondence with the screw housings on the column (4). Connect the lamp lead to the terminal connectors (10) including the ground cable</p> <p>H. Fix the cover plate (9) to the floor support (13) with the two screws (8).</p> | <ol style="list-style-type: none"> <li>1. Pin</li> <li>2. Bush</li> <li>3. Screw</li> <li>4. Column</li> <li>5. Caps</li> <li>6. Screws</li> <li>7. Nut</li> <li>8. Screw</li> <li>9. Cover</li> <li>10. Terminal connector</li> <li>11. Cable Fairlead</li> <li>12. Wall plugs</li> <li>13. Wall support</li> <li>14. Grani</li> <li>15. Caps</li> </ol> |  |
|--|---|--|

## 2.7 Electrical drawing – floor mounting without transformer



## 2.8 HEADLIGHT INSTALLATION

### 2.8.1 Mechanical Requirements

For the mechanical connection apply the following procedure:

|  |  |  |
|--|--|--|
|  | <p><b>Warning for danger of falling of suspended mass.</b><br/> <b>Strictly Follow the instruction to avoid the head to detach from the support.</b></p>   |  |
| <p>1 -Support the head and insert the washers in the threaded pin according to the sequence in the figure.<br/>                 2 - Insert ring nut G according to the sequence indicated in the picture and screw in with adequate equipment. The ring nut must be screwed in to give the correct rotational force to the head.<br/>                 3 – As term of reference the nut G must be screwed at 0,8 Nm. Use a suitable calibrated dynamometric torque wrench to screw the nut.</p> |  |  |
| <p>4 – Screw the 2 safety screws F until the cut (A) into the brass nut is completely closed.</p>  |  | <p>4 – take care to leave free space around the nut G and the support S, to avoid any friction when the head is rotating.<br/> <b>Fail to comply with this procedure could lead in falling of the headlight.</b></p> |
|  | <p><b>Caution</b><br/>                 The central arm without the head load tends to rise in a sudden manner with the risk of knocking against parts of the body. During the entire installation, keep the central arm in position and do not release it until head installation is complete.</p>   |  |
|  | <p><b>Warning for danger of suspended mass falling</b><br/>                 Only use screws supplied by FARO.<br/>                 Screw in the safety screws together.<br/>                 Before removing the nut (G) <b>ALWAYS</b> remove the safety screw F. <b>NEVER</b> unscrew the nut (G) with the screws F mounted. Fail to comply with this procedure could damage the plastic threaded PIN of the headlight with possible detach of the headlight.</p> |  |

Once mechanical connection is complete, complete electrical wiring.

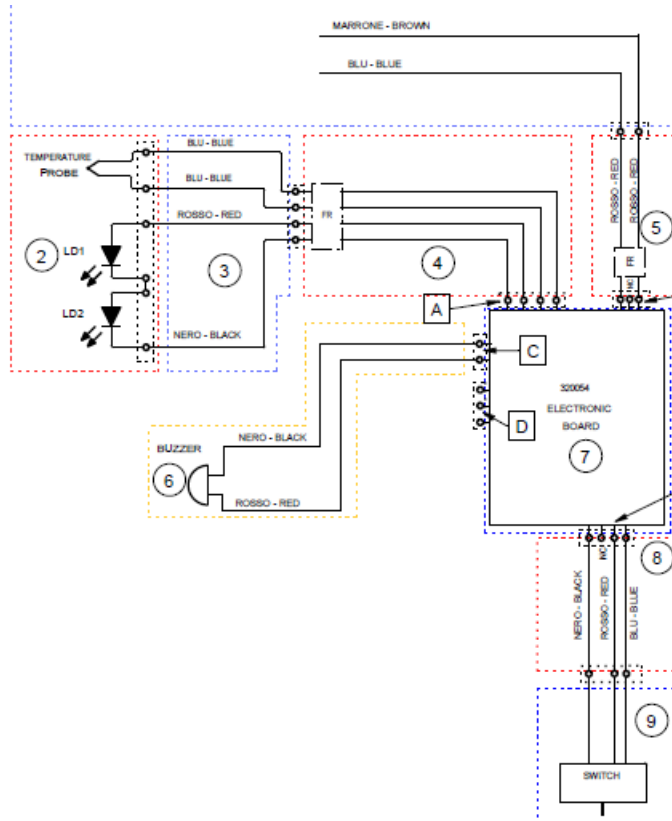
**2.8.2 Electrical Requirements**

The requirements for correct installation of the head are as follows:

| Power Supply          | Supply cables  | Power Supply requirements   | Type of Device     | Conformity to IEC 60601-1  |
|-----------------------|--|---|--------------------|--|
| 17-24 Vac<br>50/60 Hz | Cable:<br>2 cables UL Style 1061<br>RED<br>300 V<br>T 80°C         | Transformer complies with IEC/EN 60601-1 third edition.<br>Protection on secondary circuit with at least one appropriate fuse:<br>T1.6AL250V<br>Minimum requirements:<br><ul style="list-style-type: none"> <li>• Output: 17 - 24 Vac;</li> <li>• Minimum Power: 26 VA;</li> <li>• Dielectric strenght &gt; 4000 V;</li> <li>• 2 MOPP between primary and sec.</li> <li>• Thermal Protection</li> </ul> | Component built-in | The medical system must be declared compliant with IEC/EN60601-1 by the installation technician or manufacturer.<br>Note for the installation technician: ensure the combined version on which the light is installed is certified to host the complete light. |
| 25-32 Vdc             | 1x26 AWG<br>VW 1<br>Ø max 1,02mm<br>Connector:<br>Molex 43645-0200 | Power supply conform to IEC/EN 60601-1 third edition with one pole protected by appropriate fuse:<br>T1.25AL250V<br>Minimum requirements:<br><ul style="list-style-type: none"> <li>• Output: 32 Vdc;</li> <li>• Power: min 14 VA;</li> <li>• Dielectric strenght &gt; 4000 V;</li> <li>• 2 MOPP between primary and sec.</li> <li>• Continuous protection from short circuit or overcurrent</li> </ul> | Component built-in |  |

Tab 2 – Requirements for electrical connection and compliance with IEC/EN 60601-1)

**3 ELECTRICAL DRAWINGS**



D : Connector for Remote Cable (option)