

# DENTAL LIGHT

# 900

## Type

901 Pole Mount

902 Ceiling Mount

905 Track Mount

920 Unit Mount

## INSTALLATION AND OPERATION INSTRUCTIONS

### IMPORTANT

After installation is completed, check all the bolts, screws and fasteners to confirm that they are securely fastened.





## TABLE OF CONTENTS

	Page
<b>[1] SPECIFICATIONS</b> -----	1
<b>[2] CLASSIFICATION</b> -----	1
<b>[3] WIRING DIAGRAM</b>	
3-1. Pole Mount Type (Type 901)-----	2
3-2. Unit Mount Type (Type 920)-----	3
3-3. Ceiling Mount Type (Type 902) -----	4
3-4. Track Mount Type (Type 905) -----	5
 <b>INSTALLATION</b>	
<b>[4] POLE MOUNT TYPE (Type 901)</b> -----	6
<b>[5] UNIT MOUNT TYPE (Type 920)</b> -----	7
<b>[6] CEILING MOUNT TYPE (Type 902)</b> -----	9
<b>[7] TRACK MOUNT LIGHT (Type 905)</b> -----	11
 <b>OPERATION</b>	
<b>[8] OPERATING INSTRUCTIONS</b> -----	15
<b>[9] ADJUSTING TENSION of BALANCE ARM</b> -----	17
<b>[10] CLEANING</b> -----	18
<b>[11] MAINTENANCE AND INSPECTION</b> -----	19
<b>[12] ELECTROMAGNETIC COMPATIBILITY (EMC)</b> -----	20

## Intended Use of the Product

This product is intended for the exclusive use for diagnoses, treatments and relative procedures of dentistry, and must be operated or handled by the qualified dentists or by dental staffs under the supervision of the dentist. Such dentists or dental staffs should instruct and/or assist the patients to approach to and leave from the product. Patients should not be allowed to operate or handle the product unless he/she is so instructed.

## Environmental condition for Operation

Temperature : 5 ~ 40°C

Humidity : 10 ~ 80%

Pressure : 600 ~ 1060 hpa

## Environmental condition for Storage

Temperature : -20 ~ 70°C

Humidity : 10 ~ 80%

Pressure : 600 ~ 1060 hpa

## Environmental condition for Transportation

Temperature : -20 ~ 70°C

Humidity : 10 ~ 80%

Pressure : 600 ~ 1060 hpa

## Important Notes

In case of the troubles, please contact Takara Belmont offices or your dealers.

Do not disassemble or attempt to repair.

Disassembly, repair or modifications should only be done by a qualified repair technician.











Attempts at disassembly, repair or modifications may lead to abnormal operation and accidents.

## In case of disposal of equipment

When disposing the dental light, appropriately dispose complying with all current applicable regulations and local codes.

In EU area, EU directive 2002/96/EC on waste electrical and electronic equipment (WEEE) is applied on this product. In this directive, environment conscious recycling/abandonment is obligated.

## Symbols

	Alternating-current		Direct-current		Power ON		Power OFF
	Non-ionizing radiation		Authorized representative in the European community		Manufacturer		Date of manufacture
	Caution It means "caution, warnings, or possibility to danger".  Refer to operating instructions		Separate collection for electrical and electronic equipment				



## **WARNING**

Operation of a dental light under Electro Magnetic Interferences.

This equipment may malfunction by electromagnetic interferences.

Do not install dental light close to the equipment that generates electromagnetic interference (i.e. communication equipment, elevator)

Do not use the device that creates interference (i.e. cellular phone) near this equipment.

Do not use electric surgical knife or laser knife with dental light.

Light may turn on/off by itself due to malfunction of a sensor caused by electromagnetic interferences.



## **WARNING**

- To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.
- Position a light head by holding light handle(s).
- Installation and service work should be conducted by an authorized installation/service personnel only.



## **WARNING: The followings are prohibited.**

- To modify this equipment.
- To use the equipment under any failure condition.
- To use the equipment without doing the daily and periodical check-up.
- To wipe the plastic covers with any disinfectant or detergent that contains organic solvent.

## **Precautions for Installation**

- Keep the equipment away from water.
- Keep in circumstances safe from influence by temperature, humidity, wind, sun light, air containing salts and minerals.
- Care about stability such as inclination, vibration and impact, including handling and transportation.
- Do not keep the equipment in a place where chemicals are or where gas is emitted.
- During lifting and unpacking of the light, make sure to hold only the designated parts.
- Do not drop or hit the light.
- Ground light properly prior to turning power on.
- When the installation process has been completed, verify that all the mechanical and electrical functions are working properly.
- Thick gloves are highly recommended at unpacking.
- Do not modify this equipment.

## CAUTION

### Before use

- Check connection of switches and make sure that the device functions properly.
- Make sure that grounding wire is connected.
- Make sure that cables are properly and perfectly connected.

### During use

- Do not use the light longer than required for examination or treatment.
- Always watch the patient and the equipment to make sure nothing is wrong.
- If anything wrong is observed with the equipment or the patient, take a proper action, such as stopping the use of equipment as well as keeping the patient in safe.
- Keep an eye on the patient not to touch the equipment.

### After use

- Turn off the light.
- Clean the equipment and get it ready for use.

## CAUTION

Do not spray liquids directly onto light surfaces.

In order to prevent damage to electrical components and systems, do not apply excess cleaning solution onto light surfaces.

## NOTE

Warranty does not cover damage to equipment caused by disinfectant solutions

## [1] SPECIFICATIONS

1. Focal Distance ..... 650 mm
2. Color Temperature ..... 5000° Kelvin
3. Light Intensity
  - Normal Treatment Mode ..... 4000 Lux ~ 32000 Lux
  - Composite Mode ..... 5500 Lux
4. Color Rendering Index ..... More than 90
5. Light Pattern ..... 85 mm x 155 mm
6. Power Requirement ..... Type 901/902/905 AC230V 50Hz 0.26A  
Type 920 DC20V 1.2A

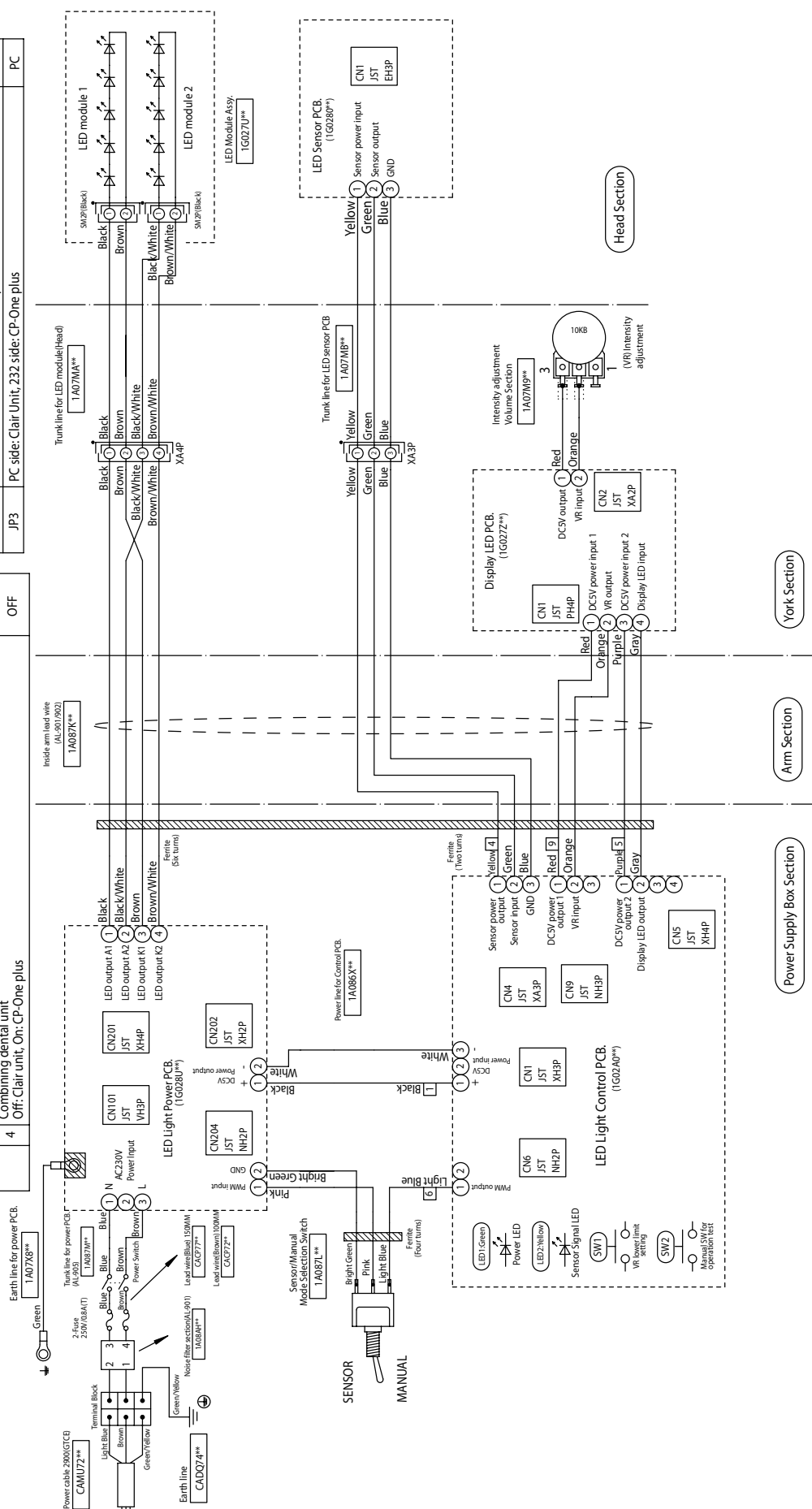
## [2] CLASSIFICATION

- a. Protection against electric shock : Class I Equipment.
- b. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

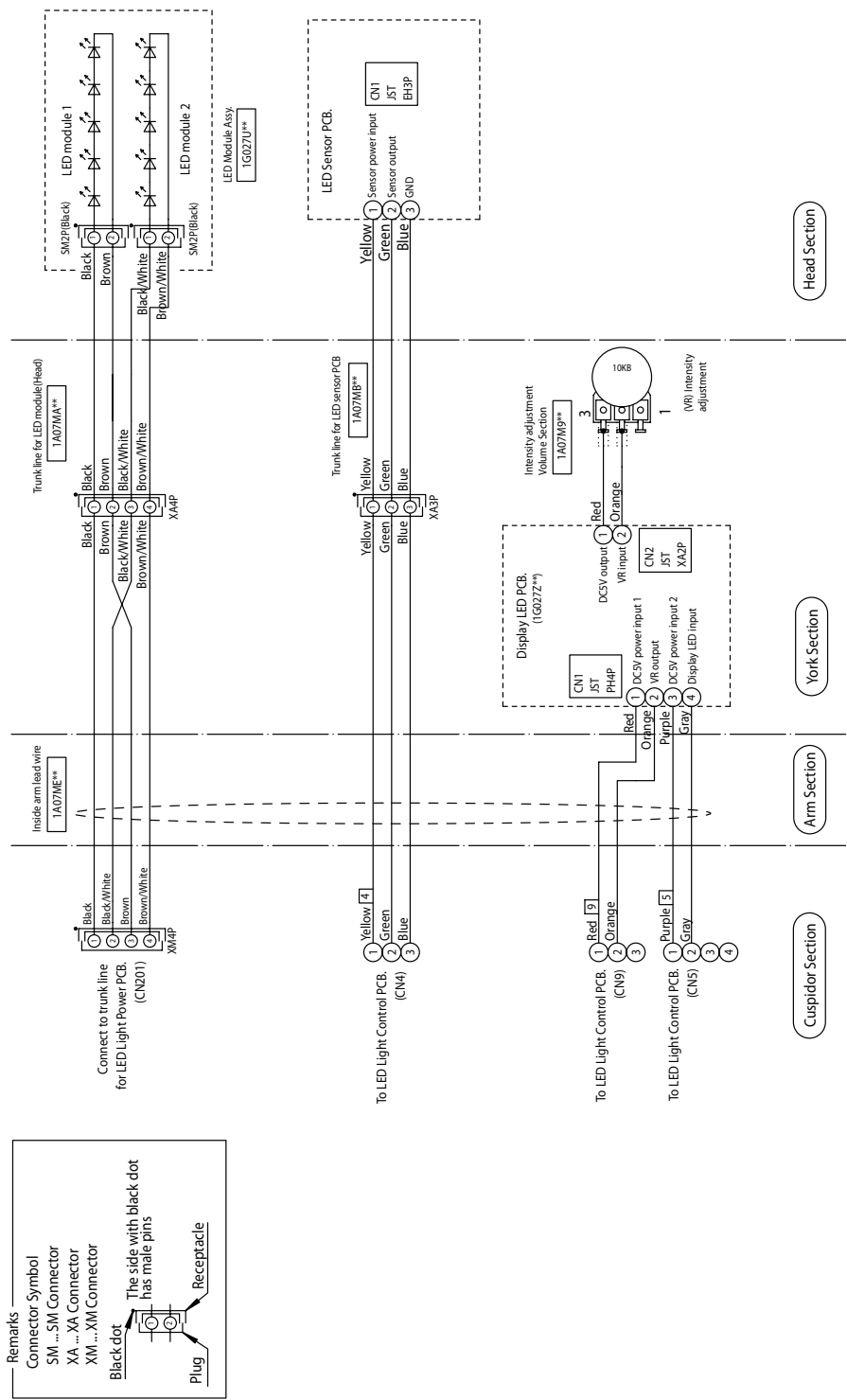
### 3-1. Pole Mount Type (Type 901)

Remarks -

Connector Symbol
SM ... SM Connector
XA ... XA Connector



3-2. Unit Mount Type (Type 920)





### 3-3. Ceiling Mount Type (Type 902)

Settings of PCB dip switches ( SW3,4) and jumper pin (JP3).

		Setting condition	Default setting
SW3		Sensor activation setting Off: Activate when a hand goes away, On: Activate when a hand comes in.	OFF
	5		
	6	6 includes Composite Mode Off: Yes, On: No	OFF
	SW3	Speed setting of communication line Off: 4800bps, On: 2400bps	OFF
	8	LED blink setting of Composite Mode Off: Slow blinking, On: Rapid blinking	OFF
	SW4		
	JP3	PC side: Clair Unit, 232 side: CP-One plus	PC

		Setting condition	Default setting
SW3	1	Test mode (Always OFF) Off: Normal operation, On: Test operation	OFF
	2	Transition time to Composite mode (by a sensor) Off: 1 second, On: 2 seconds	ON
		Wake-up brightness setting from light off condition. Off: 1. Composite Mode when a light is turned on by using a sensor. 2. Keeps on getting on/off signal from dr table, light stays in composite mode. On: 1. Regular Mode when a light is turned on by using a sensor. 2. Keeps on getting on/off signal from dr table, light goes into regular mode.	ON
	3		
4	Combining dental unit Off: Clair unit, On: CP-One plus	OFF	

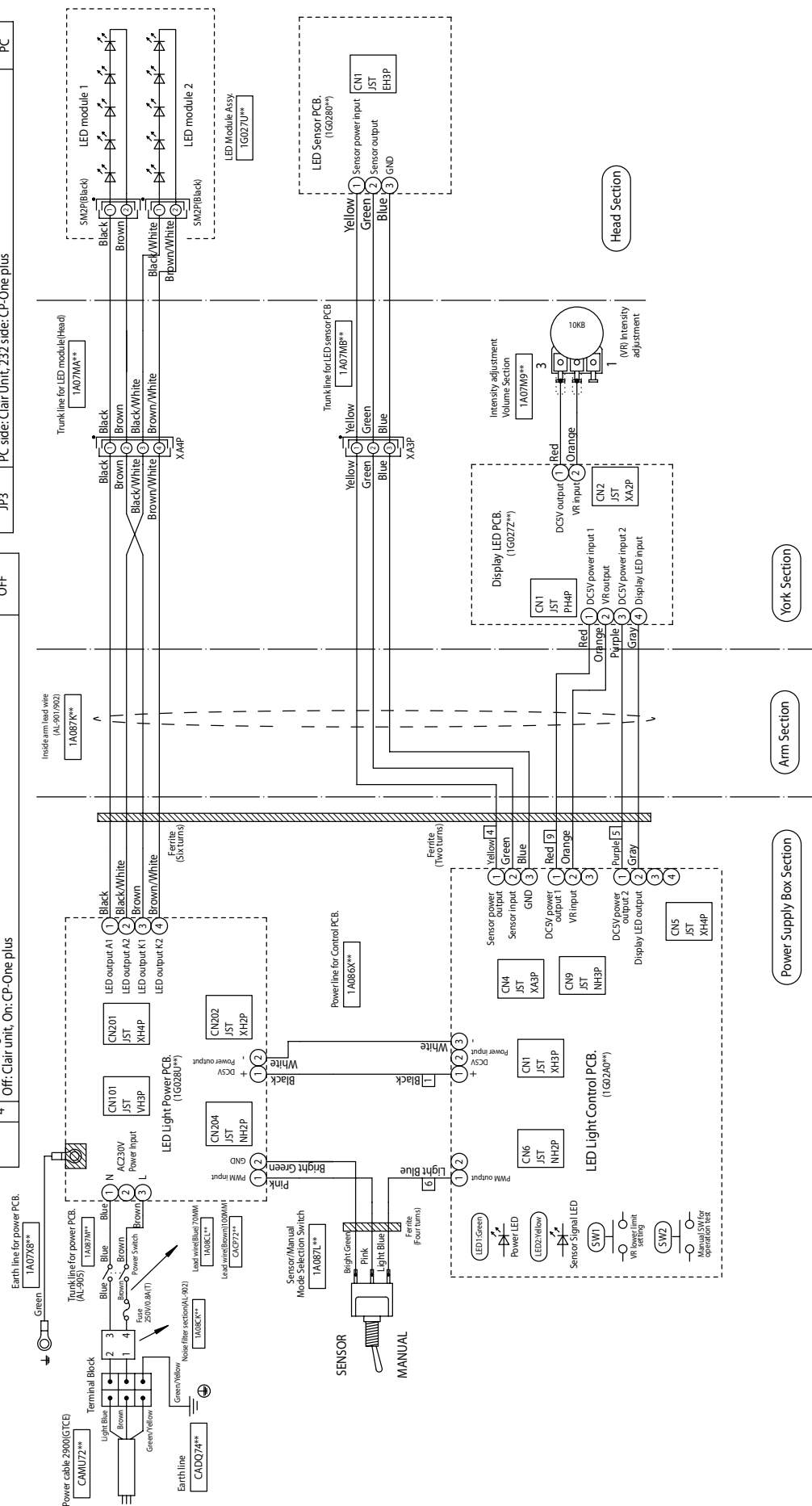
Remarks -

Connector Symbol
SM ... SM Connector
XA ... XA Connector

black dot

Receptacle

Drug

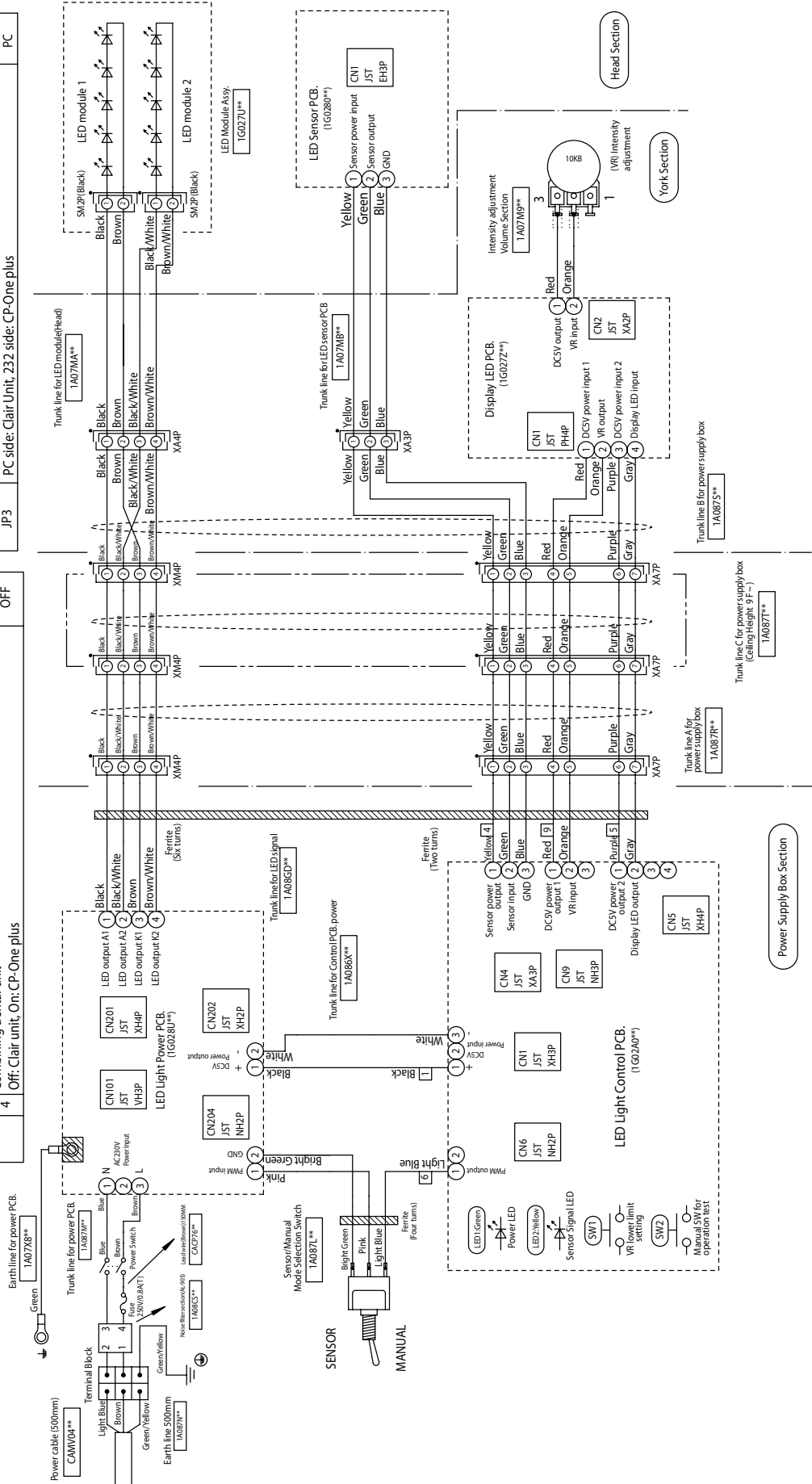
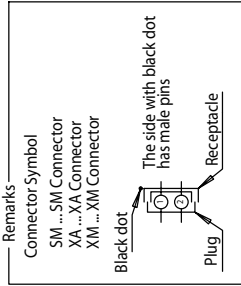


3-4. Track Mount Type (Type 905)

Settings of PCB dip switches (SW3,4) and jumper pin (JP3).

Setting condition		Default setting
SW3	1 Test mode (Always OFF) Off: Normal operation, On: Test operation	OFF
	2 Transition time to Composite mode (by a sensor) Off: 1 second, On: 2 seconds	ON
	3 Wake-up brightness setting from light off condition. Off: 1. Composite Mode when a light is turned on by using a sensor. On: 1. Regular Mode when a light is turned on by using a sensor. On: 2. Keeps on getting on/off signal from dr table, light stays in composite mode. On: 1. Regular Mode when a light is turned on by using a sensor. On: 2. Keeps on getting on/off signal from dr table, light goes into regular mode.	ON
	4 Combining dental unit Off: Clair unit, On: CP-One plus	OFF

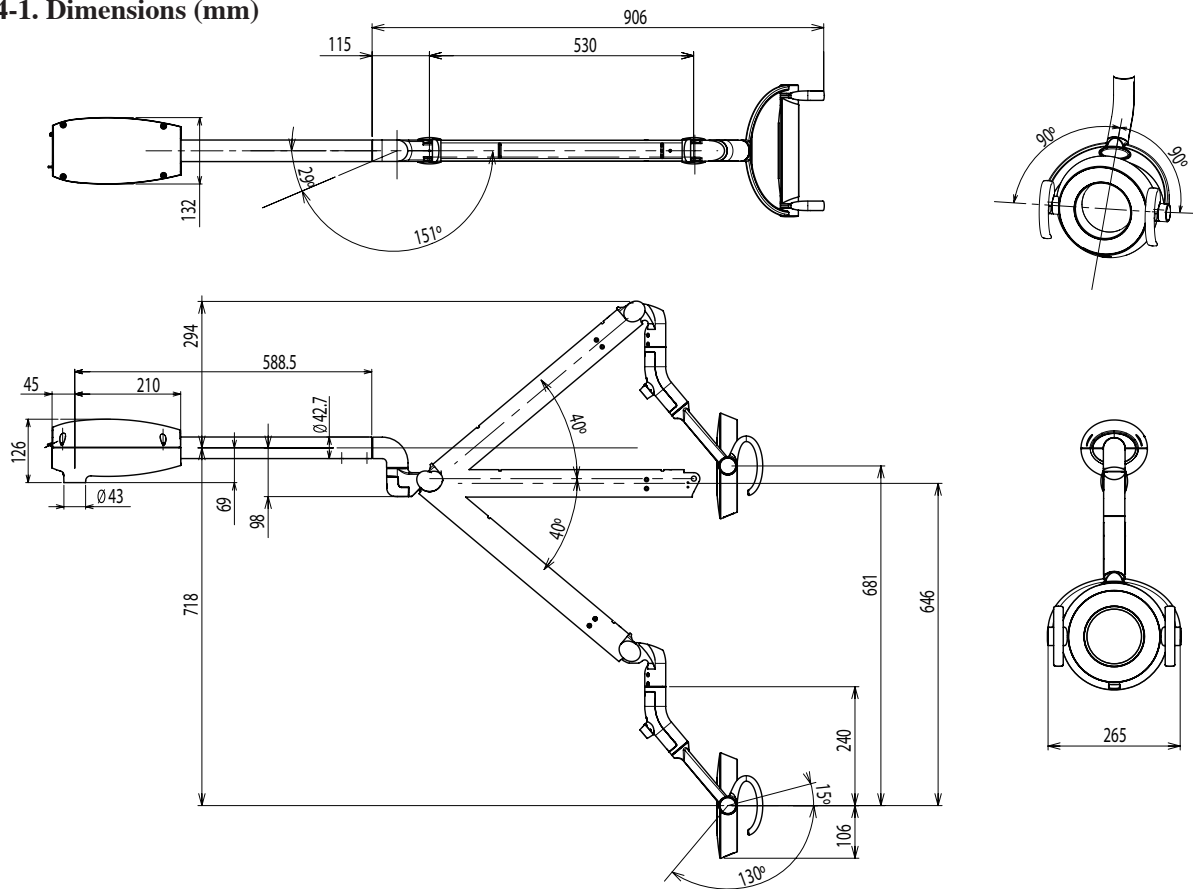
Setting condition		Default setting
SW3	5 Sensor activation setting Off: Activate when a hand goes away, On: Activate when a hand comes in.	OFF
	6 Includes Composite Mode Off: Yes, On: No	OFF
	7 Speed setting of communication line Off: 4800bps, On: 2400bps	OFF
	8 LED blink setting of Composite Mode Off: Slow blinking, On: Rapid blinking	OFF
SW4	PC side: Clair Unit, 232 side: CP-One plus	PC
	JP3 PC side: Clair Unit, 232 side: CP-One plus	PC



## INSTALLATION INSTRUCTIONS

### [4] POLE MOUNT TYPE (Type 901)

#### 4-1. Dimensions (mm)



#### 4-2. Installation Instructions

\* All necessary parts are included in the box.

- M3 x 6 Painted Screw ----- 2pcs
- M4 x 10 Painted Screw ----- 2pcs
- Yoke Cover ----- 1pce

1) Install the light head to the balance arm with M4 x 10 painted screws.

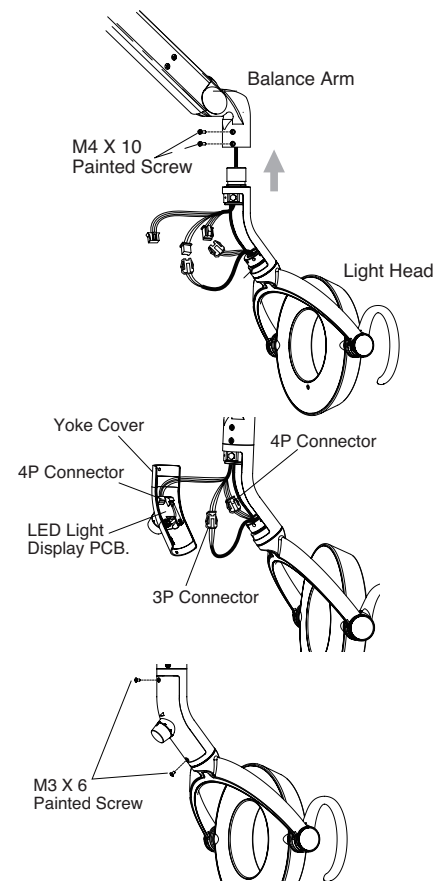
2) Connect the wire harness

3P connector : yellow / green / blue  
 4P connector : black / black & white / brown /  
 brown & white

Same color to be met at each side of connector

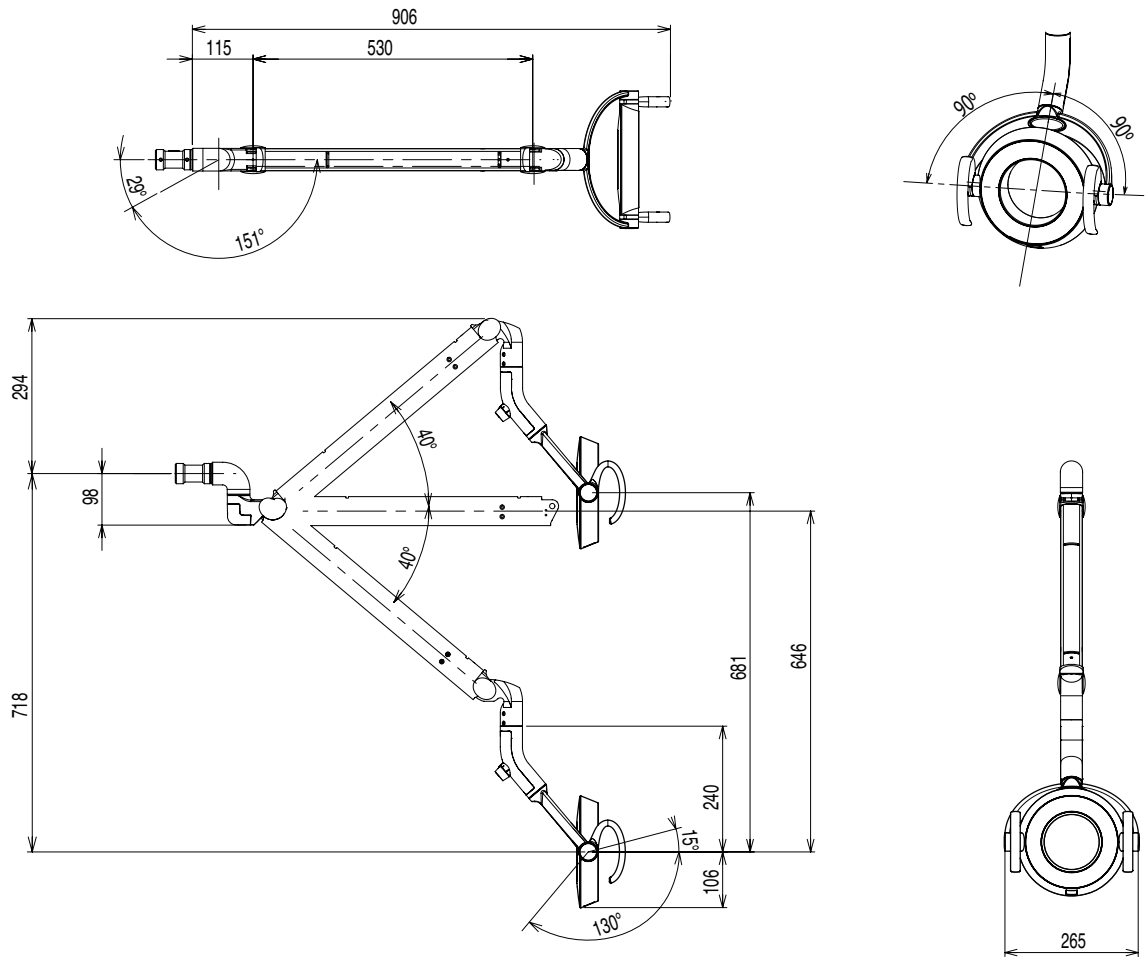
4P connector : red / orange / purple / gray  
 connec to LED Light display PCB of yoke cover.

3) Attach the yoke cover with M3 x 6 painted screws.



## [5] UNIT MOUNT TYPE (Type 920)

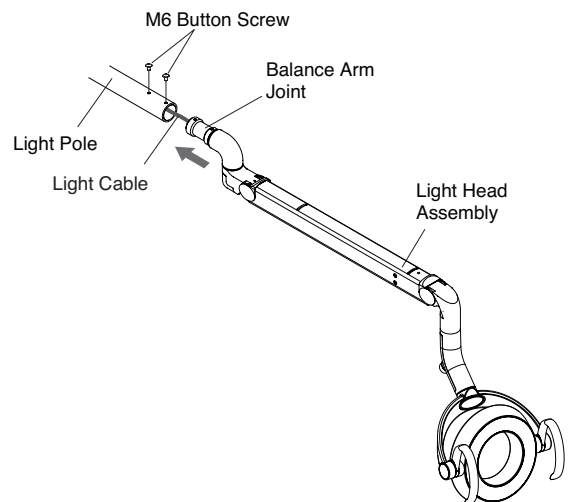
### 5-1. Dimensions (mm)



### 5-2 . Installation Instructions

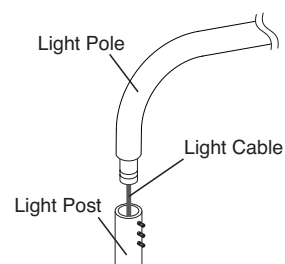
- (1) Attach the light assembly to the light pole.

Pass the light cable through the light pole and insert the light pole joint into the light pole. Fasten with two M6 button screws.



- (2) Attach the light pole to the light post.

Pass the light cable through the light post and insert the light pole into the light post. Fasten with screws.



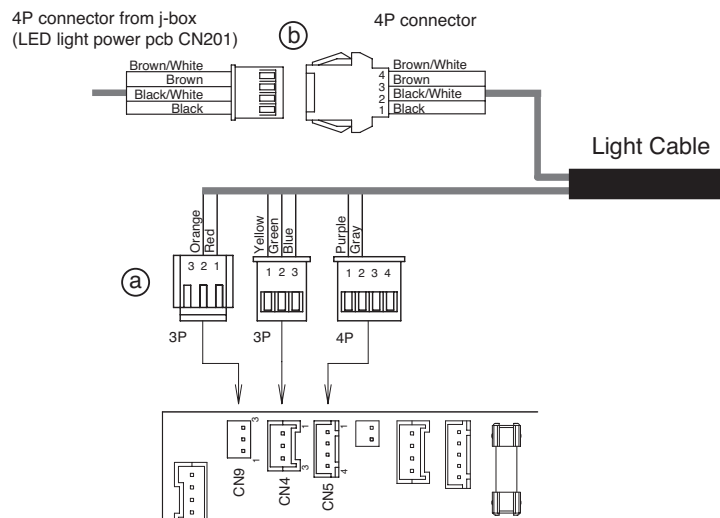
### (3) Connect the light cable

Attach the connectors of the light cable onto the dental light PCB and harness inside the cuspidor unit.

#### a) Connect the three connectors (3pins,3pins and 4pins) of the light cable onto the LED light control PCB.

The LED light control PCB is located at the rear side of the cuspidor unit.

#### b) Connect the 4pins connectors.

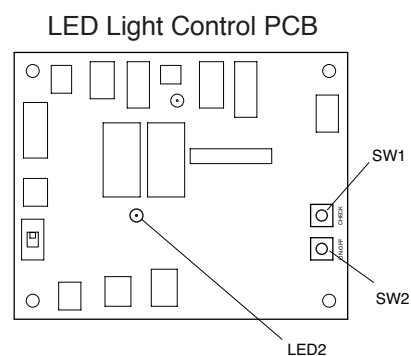
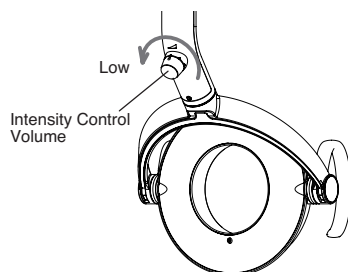


### ⚠ CAUTION

- Securely insert a connector
- Make sure pins are firmly inserted
- When you remove a connector, instead of pulling wire, pull a connector by holding connector housing

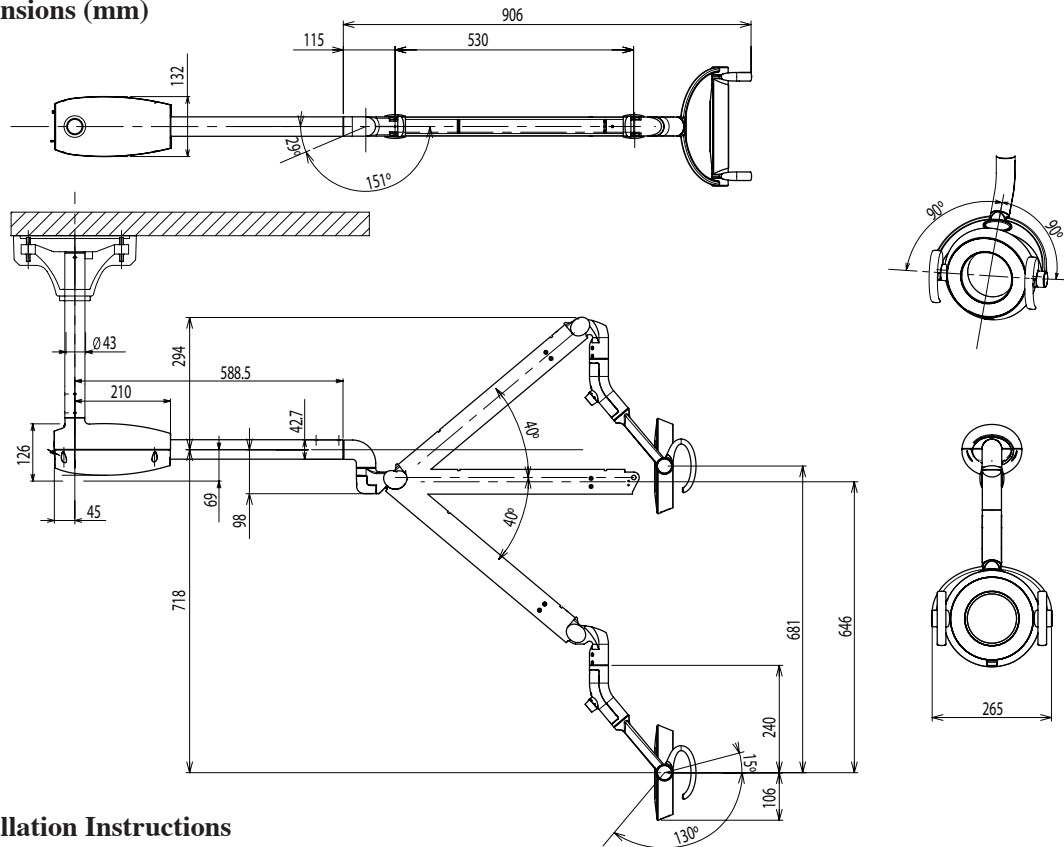
### (4) Set the lower volume limit (Type 920 only)

1. Turn light intensity control volume to its lowest end. (turn counter clockwise)
2. Push SW1 (CHECK) on a LED Light Control PCB. Yellow LED2 blinks.
3. Push SW2 (ON-OFF) on a LED Light Control PCB. Yellow LED2 turns off.



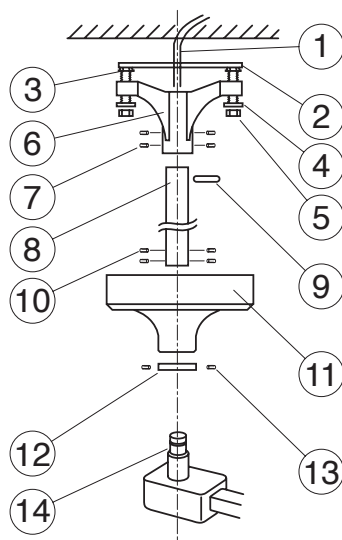
## [6] CEILING MOUNT TYPE (Type 902)

### 6-1. Dimensions (mm)



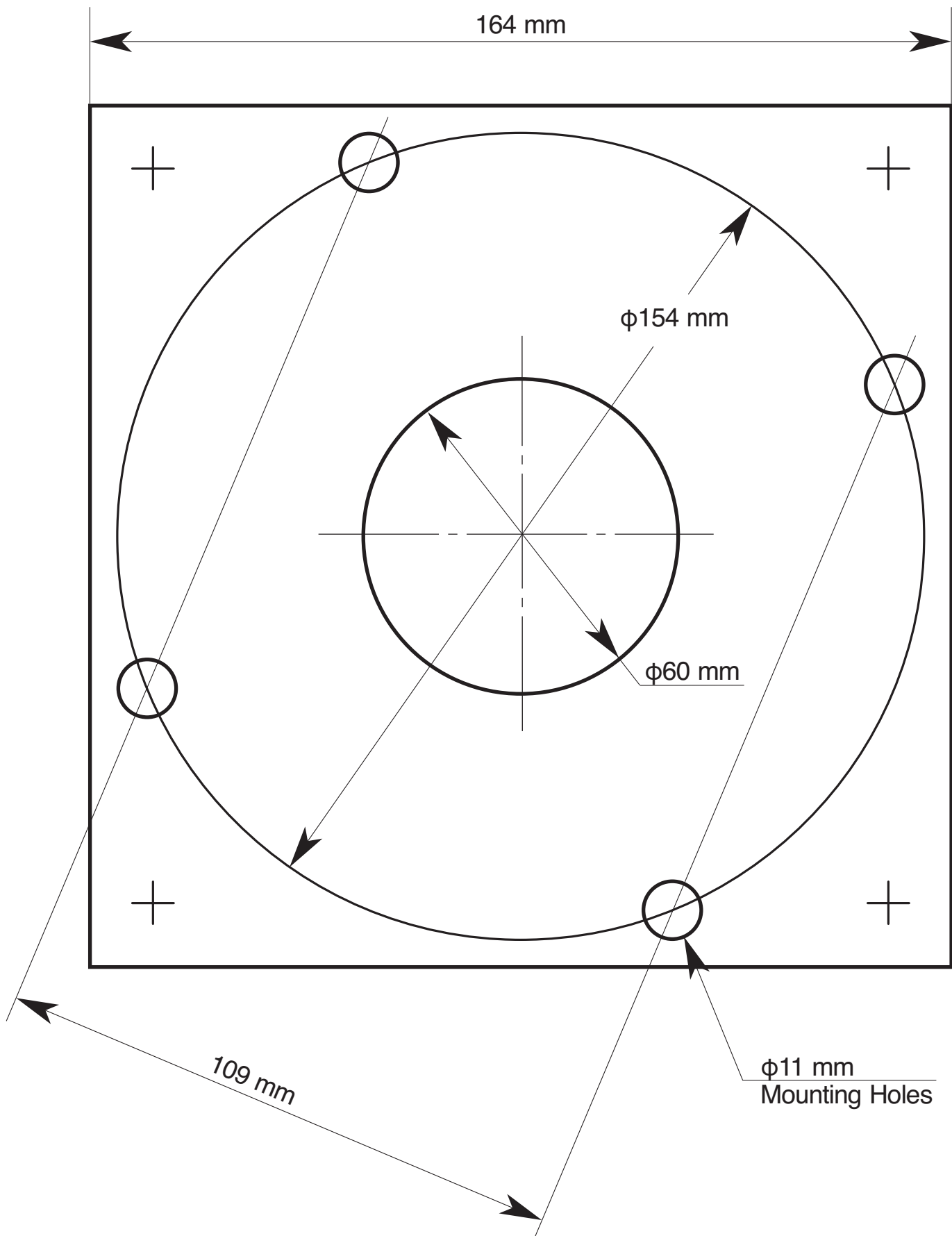
### 6-2. Installation Instructions

- 1) Secure mounting plate to the ceiling.
- 2) Route the power supply through the center of the mounting plate.
- 3) Install the leveling nuts between the mounting plate and the ceiling flange.
- 4) Install the ceiling flange to the mounting plate with washers and nuts supplied.
- 5) Insert the suspension tube into the ceiling flange and secure it with roll pin and set screws supplied.
- 6) Be sure the suspension tube is plumb.
- 7) Slide the flange cover and flange cover ring (flat side up) over the suspension tube and secure them about half way up the tube. Use only one set screw as you will be moving this on final installation.
- 8) Install the light assembly to the suspension tube running the 3 wire cord up through the tube to the ceiling flange. Secure it with 4 Allen set screws.
- 9) Connect the incoming power to the 3 wire cord from the light assembly. Be sure to follow the local electrical codes.
- 10) Test the light for proper operation.
- 11) Reposition the flange cover and secure it with the flange cover ring - Secure all set screws.



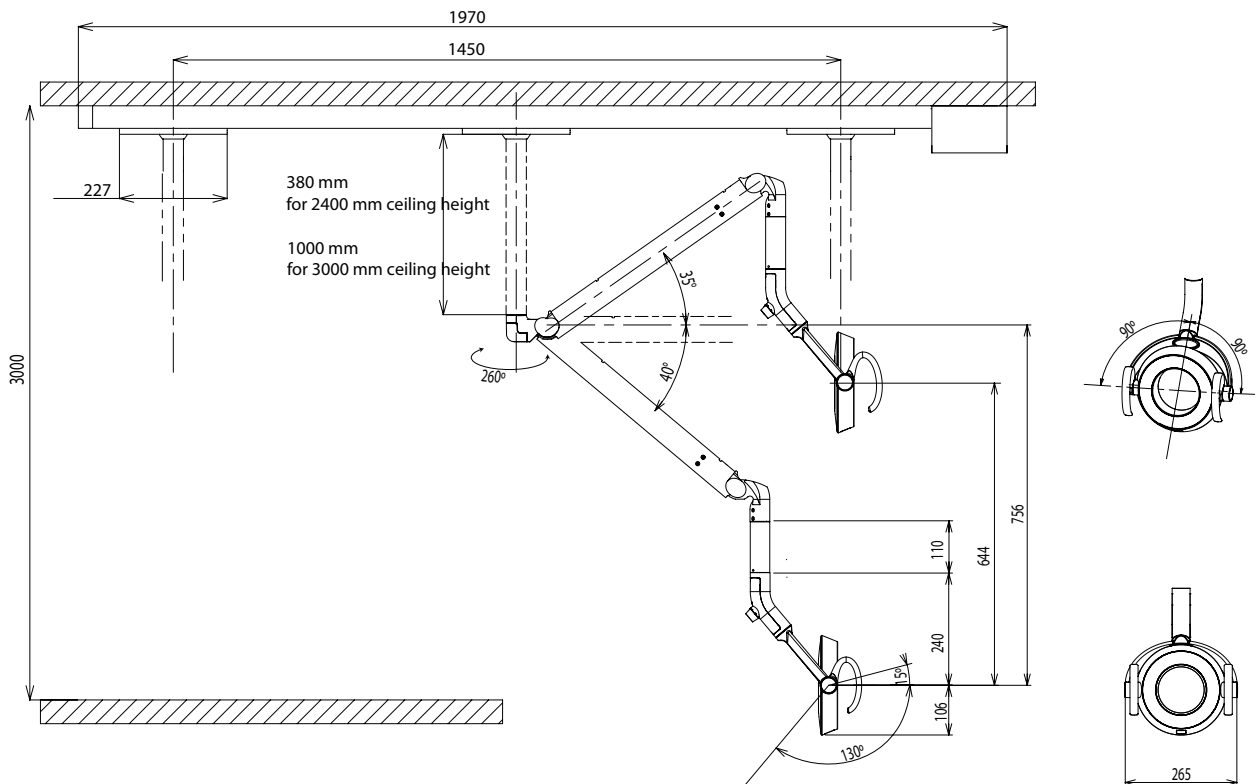
- (1) Power Supply Cable
- (2) Mounting Plate
- (3) Leveling Nut
- (4) Washer
- (5) Nut
- (6) Ceiling Flange
- (7) Socket Screw for Flange
- (8) Suspension Tube
- (9) Roll Pin
- (10) Socket Screw for Arm
- (11) Flange Cover
- (12) Cover Ring
- (13) Socket Screw for Ring
- (14) Suspension Tube of Arm

### 6-3. Ceiling template (Full size)



## [7] TRACK MOUNT LIGHT (Type 905)

### 7-1. Dimensions (mm)



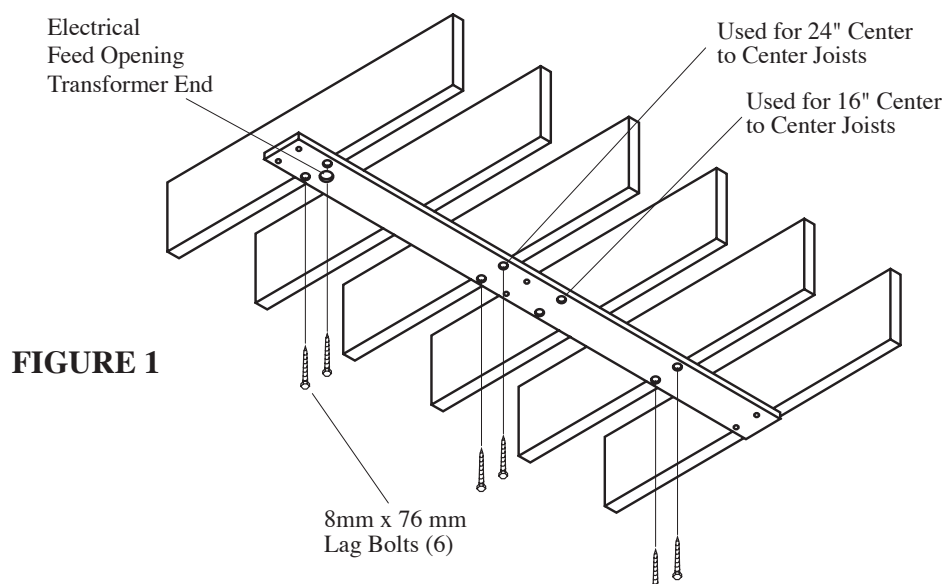
### 7-2. Ceiling Preparation

For safety in operation as well as stability of the light source, the importance of proper ceiling structure cannot be overemphasized. In general, a ceiling structure capable of supporting 90kg (200 lbs) dead weight is required.

- A) In conventional ceilings with **joists perpendicular** to the center line of the light, attach the pallet by **at least 6 (M8 x 76mm)** lag screws. Suitable holes are provided in pallet for most installations, utilizing 16"(406 mm) or 24"(610 mm) center to ceiling joists. For other spacings or locations, additional holes can be cut in pallet. (SEE FIGURE 1.)

**IMPORTANT:** Locate transformer end of track at headrest end of chair. - **Not** legrest.

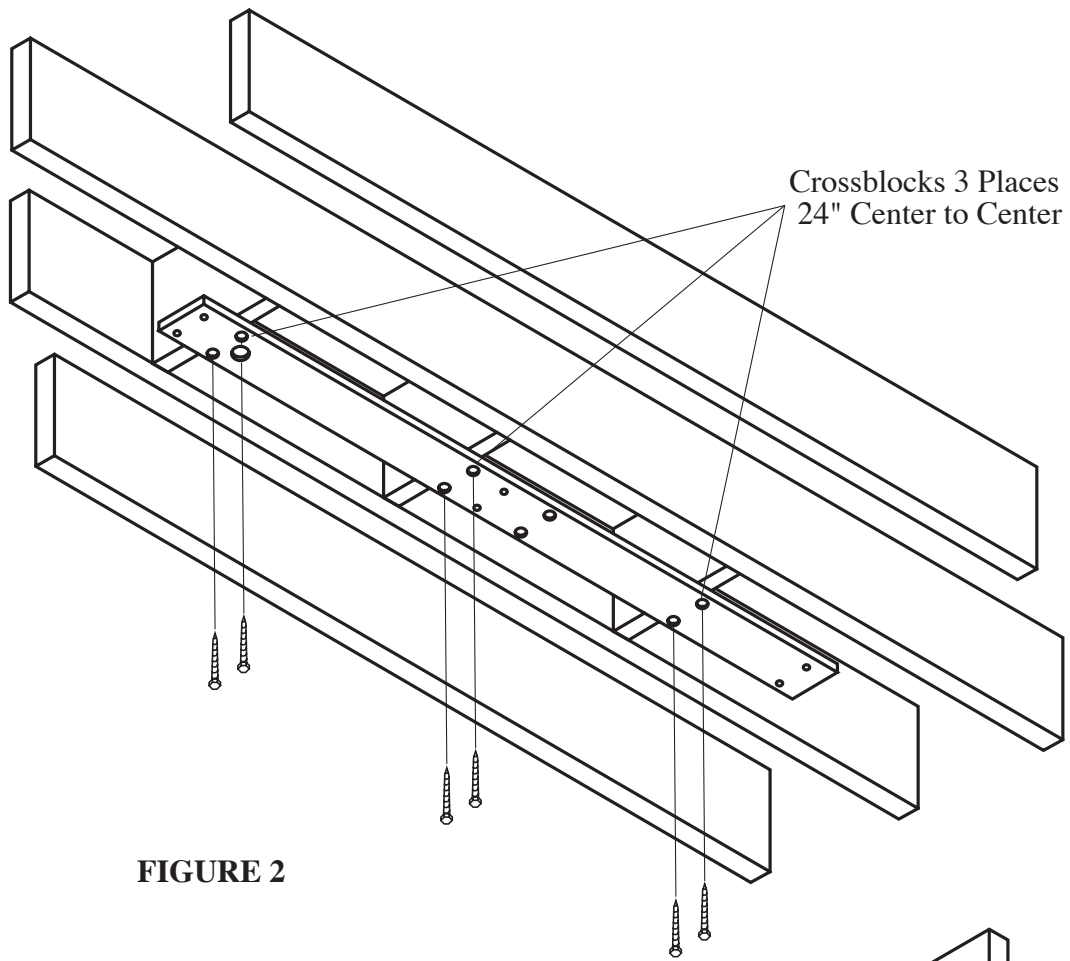
- B) For conventional ceilings with **joists parallel** to the center line of the light, cross blocks must be installed in 3 places to allow mounting with **at least 6 (M8 x 76 mm)** lag screws. (SEE FIGURE 2.)
- C) For suspended ceilings, appropriate rigid structure must be attached to the ceiling framework to provide 90kg (200 lbs) dead weight capacity. (SEE FIGURE 3.)



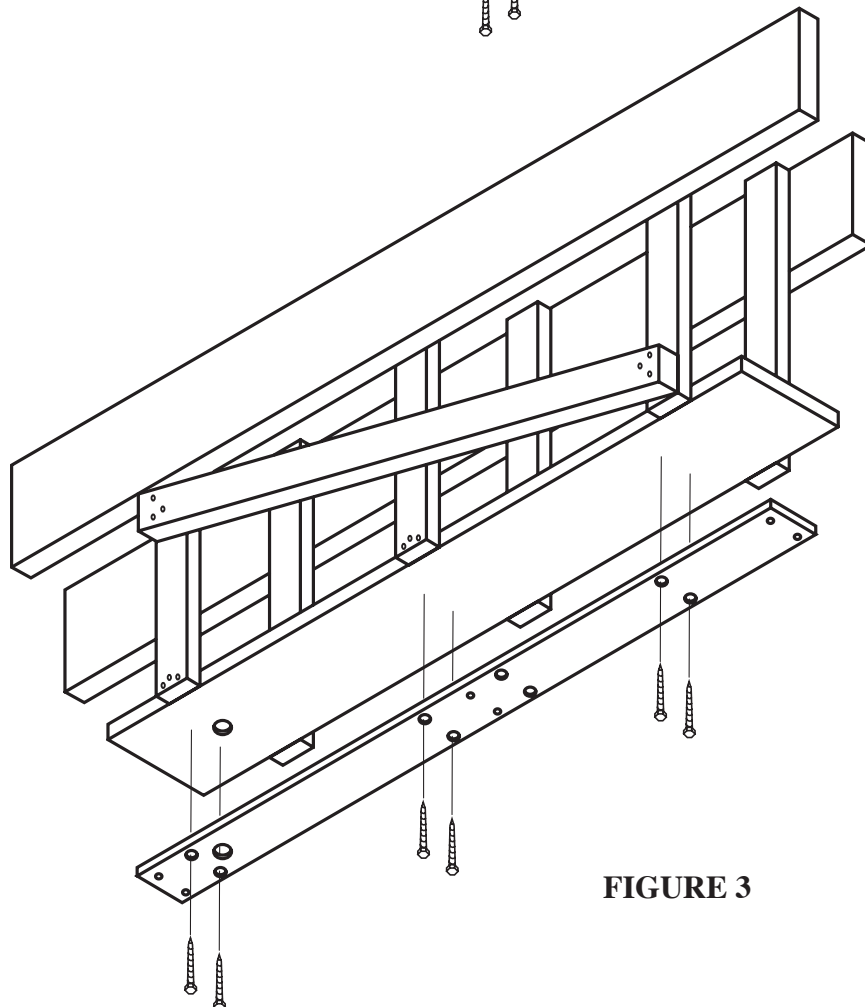
**FIGURE 1**



## CEILING PREPARATION



**FIGURE 2**

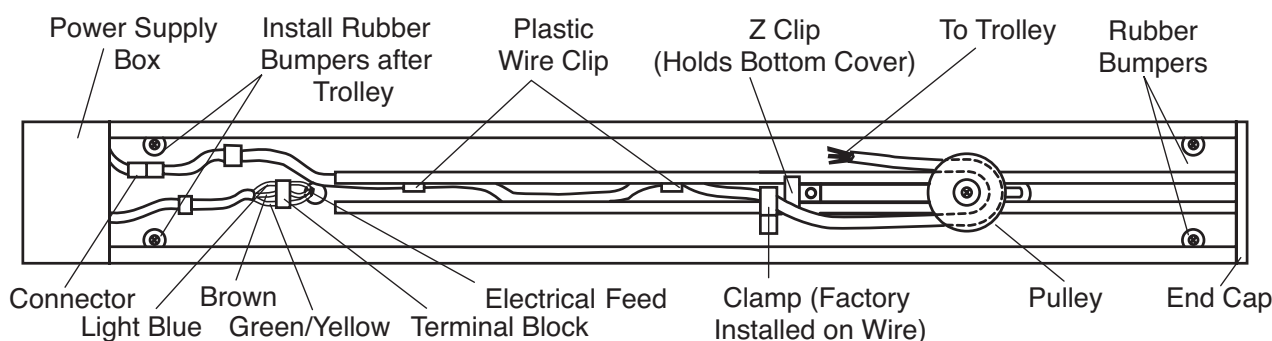


**FIGURE 3**

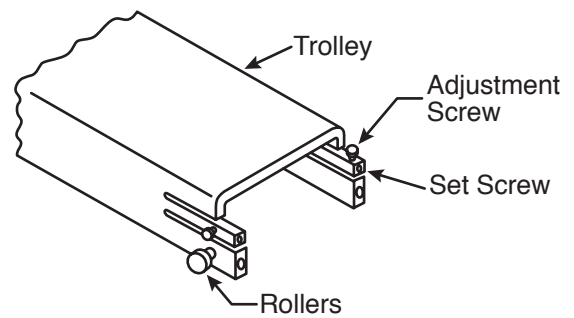
Refer to **FIGURE 4** for the location of electrical feed opening in pallet, provide 3 wire, circuit (fuse or breaker) through flexible conduit with enough slack to protrude at least 50mm below the pallet when installed. Terminate the conduit with 13mm body box connector suitable for mounting through 5mm thickness. A readily accessible shut-off switch for this circuit is recommended. Use wiring suitable for 90°C service.



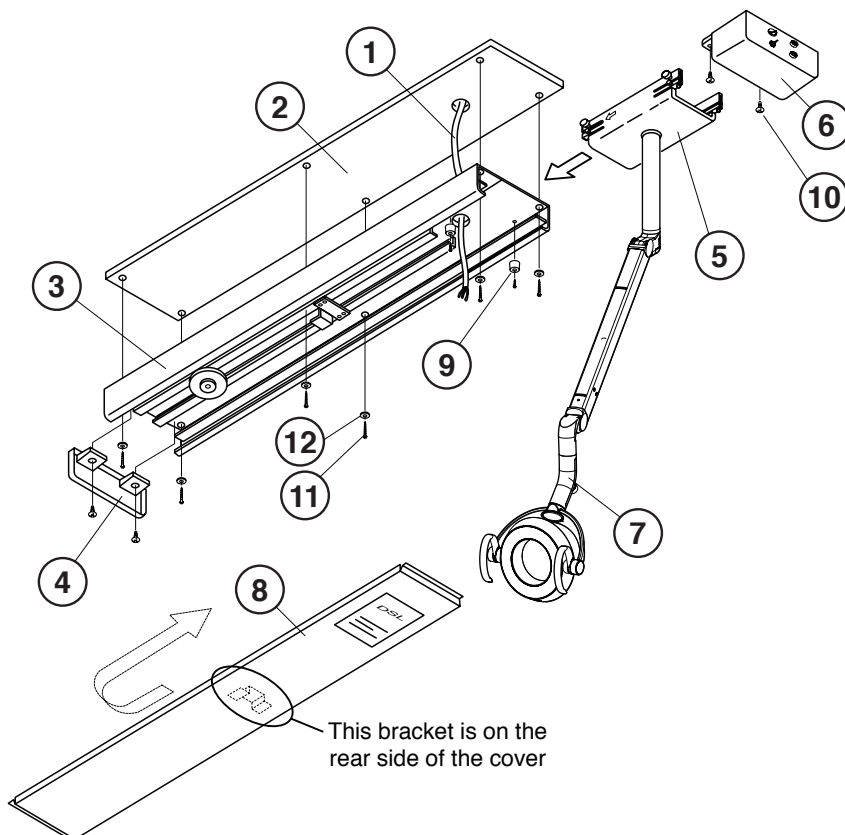
- 1) Lead out the power supply cable from the ceiling where the track light is mounted.
- 2) Run the power supply cable through the pallet and mount the pallet.
- 3) Place track against the pallet and slightly engage two mounting bolts at the end opposite to the electrical opening.
- 4) Allowing the free end to hang down slightly for access, install the conduit box connector to the track.
- 5) Finish bolting the track securely to the pallet.
- 6) Connect the wires from the feed to the terminal block.
- 7) Slide the trolley onto the track (end near electrical opening) with the arrow on the trolley oriented toward the pulley on the track.
- 8) Carefully guide the wire from the trolley, around the spring-loaded pulley and back toward the end of track.
- 9) Attach retainer clamp to small screw in track. Clip the free end of the trolley wire into the plastic clip near end.
- 10) Install rubber bumpers at the end of the track in the holes provided.



- 11) Check operation of the trolley. It is factory adjusted to provide smooth effortless travel, without play; however rollers can be readjusted if necessary. Loosen the set screw and adjust the socket cap screw to vary roller clearance.



- 12) Unpack the power supply box / housing assembly and mount it to the track with screws provided.
- 13) Attach the pigtail leads to the corresponding power line wires at the terminal block. Retain the wires under the plastic clip.
- 14) Connect the plug-in connector to the trolley wire.
- 15) Carefully slide bottom cover onto the track from free end. Be sure to engage lip onto Z bracket.
- 16) Install the end-cap with the screws provided.
- 17) Slide the trolley back and forth, checking for binding or rubbing.
- 18) Confirm that the swing arm is properly adjusted to stay where it is placed. If necessary, move the head up or down to expose the appropriate cross drilled nut and adjust with the tool provided.
- 19) Turn on power and check electrical operation of the light.

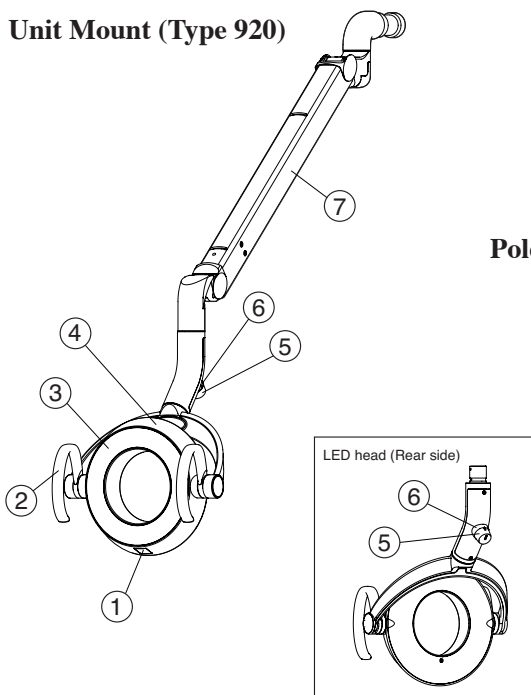


- (1) Power supply cable  
 (2) Pallet  
 (3) Track  
 (4) End-cap  
 (5) Trolley  
 (6) Power Supply Box  
 (7) Light Assembly  
 (8) Bottom Cover  
 (9) Rubber bumper  
 (10) Screw with plain washer & spring washer M4x15(2 pcs)  
 (11) Hex Head Bolt M8x25(6 pcs)  
 (12) Spring Washer M8 (6 pcs)

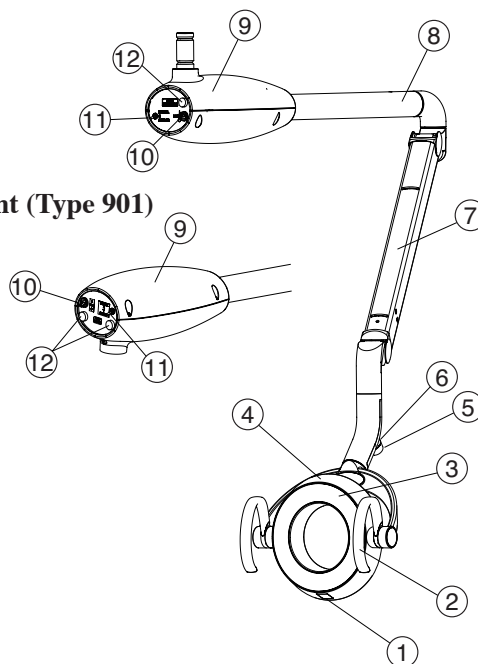
## [8] OPERATING INSTRUCTIONS

### 8-1. Major Parts Identification

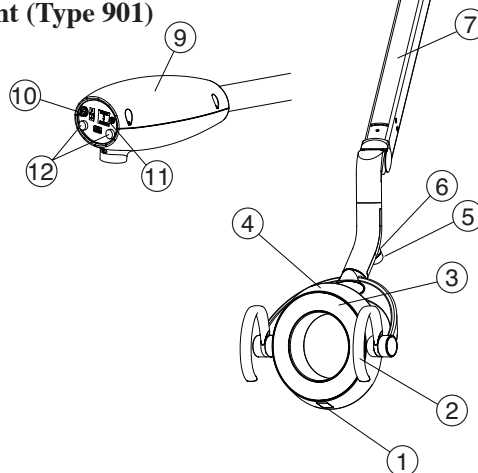
**Unit Mount (Type 920)**



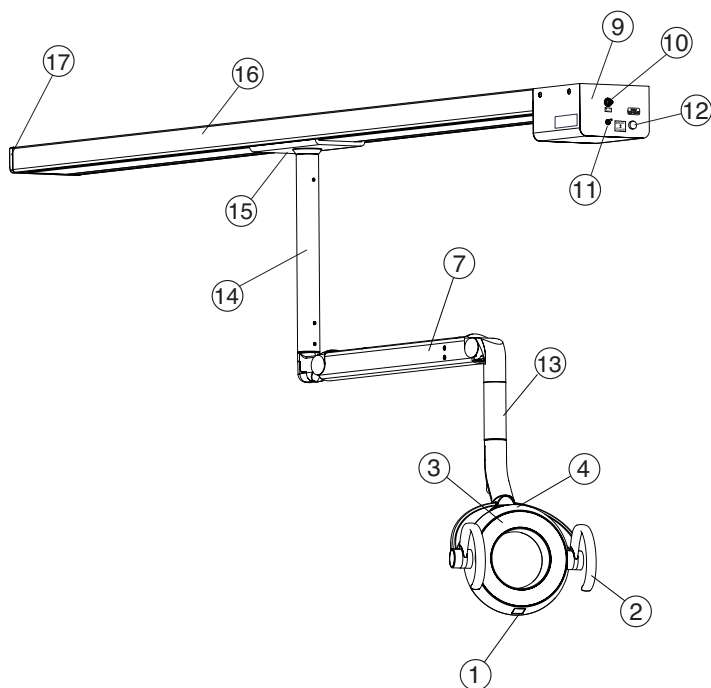
**Ceiling Mount (Type 902)**



**Pole Mount (Type 901)**



**Track Mount (Type 905)**



- (1) Touchless switch
- (2) Handle
- (3) Lens cover
- (4) LED light head
- (5) Intensity control volume
- (6) LED display
- (7) Balance arm
- (8) Swing arm
- (9) Power supply box
- (10) Main switch
- (11) Mode selection switch
- (12) Fuse
- (13) Extension
- (14) Track pole
- (15) Trolley
- (16) Track
- (17) End cap

## 8-2. Main Switch

Turn on the main switch to the side marked with 'I'

Power on : 'I' Mark

Power off : 'O' Mark

## 8-3. Mode Selection Switch

Switching modes can be changed by this switch.

This switch is located on power supply box.

Sensor : Touchless ON/OFF and composite mode

Manual : Manual Mode (ON only)

## 8-4. Touchless Switch

The light can be turned on/off with a touchless switch. The intensities are regular operation mode and composite mode.

### 8-4-1. Confirmation of mode selection switch

Make sure that the mode selection switch is at sensor mode.

### 8-4-2. Turning on/off

The touchless switch has a sensor. The sensor activates within the distance of 65mm from the surface. Let your hand pass by within 65mm from the touchless sensor to turn on the light.

Let your hand pass by again to turn off.

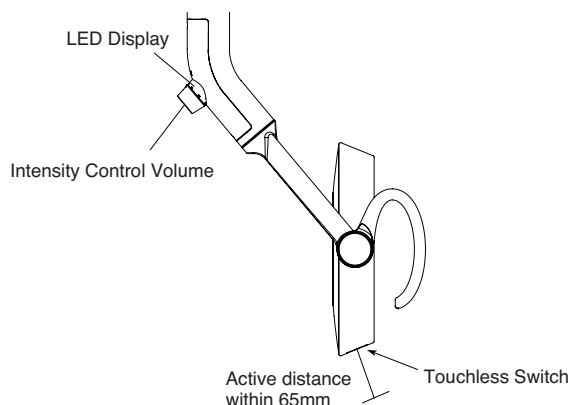
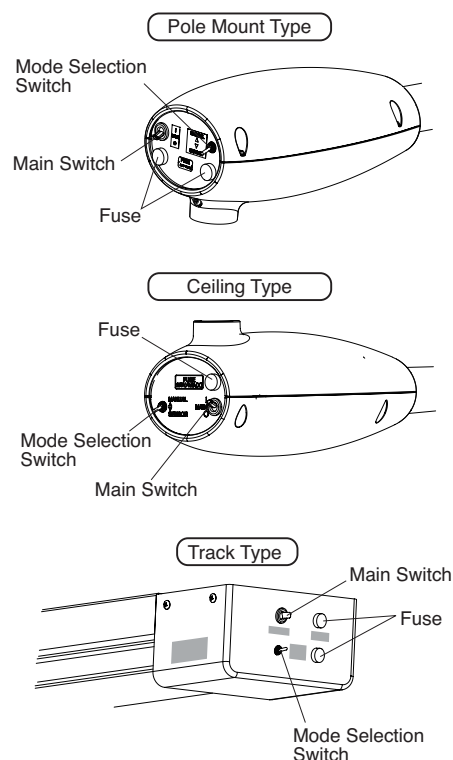
### 8-4-3. Switching to the composite mode

During normal treatment mode, while the light is on, place and hold your hand within 65mm from the touchless sensor for 2 seconds. The light intensity will be automatically reduced to the composite mode which has intensity of 5500 lux.

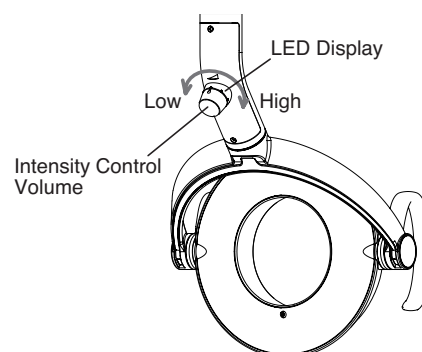
LED display under yoke blinks green on at composite mode.

To switch back to the normal treatment mode, place your hand by the touchless sensor 2 seconds again.

Note: by placing your hand for 2 seconds when the light is off. The light does not lit in the composite mode, but lit in normal treatment mode. Please make sure that the light is on before lighting in composite mode.



	INTENSITY	LED DISPLAY (Green)
NORMAL TREATMENT MODE	4000 ~ 32000Lux	Light ON (Green)
COMPOSITE MODE	5500 Lux	Blinks (Green)



## [9] ADJUSTING TENSION of BALANCE ARM

### 9-1. Adjustment of the tension of the balance arm

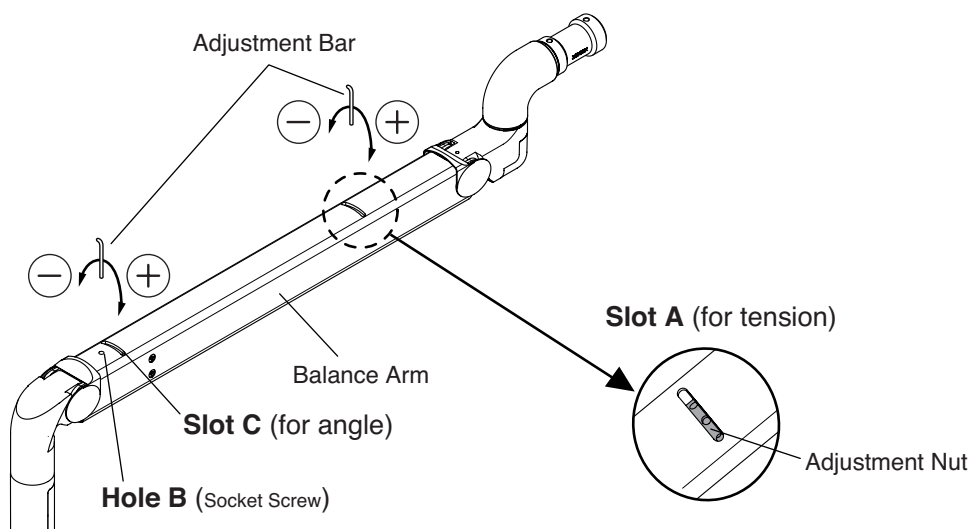
Position the angle of the balance arm so the tension adjustment nut becomes visible just under slot A.

Turn the nut and adjust the tension with the adjustment bar supplied with the light.

Direction of rotation of the nut —————

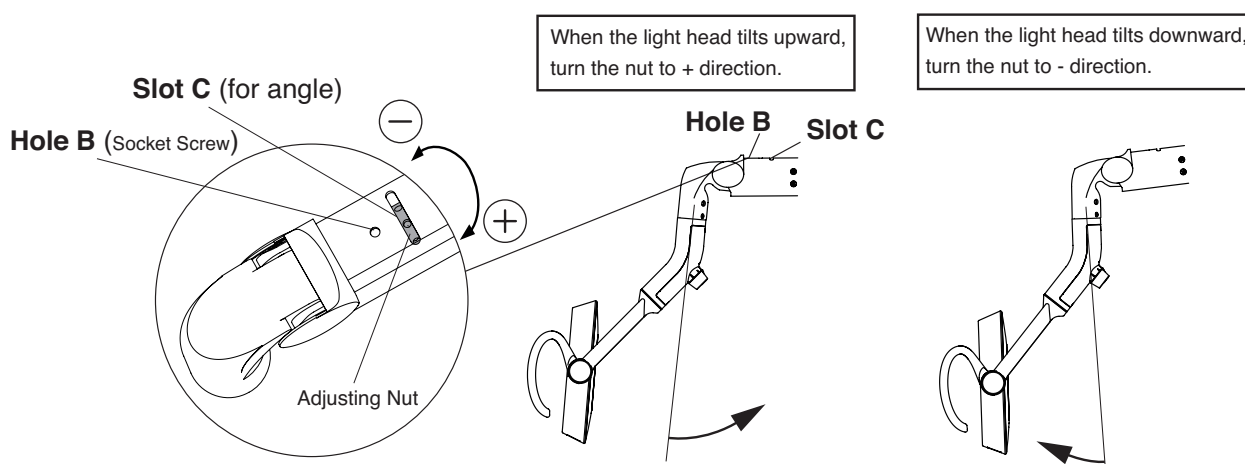
When the light head tends to go up, turn the nut to + direction.

When the light head tends to go down, turn the nut to – direction.



### 9-2 Adjustment of the angle of the light head

- 1) Use a 2mm hex key wrench to loosen socket screw in front of Hole B.
- 2) Position the angle of the balance arm so the head angle adjustment nut becomes visible just under the slot C. Turn the nut and adjust the tension with the adjustment bar supplied with the light.



- 3) After adjustment is done, re-tighten the socket screw.

Note : Unless this socket screw is re-tightened, the angle of the head will be changed during use.

## [10] CLEANING

### **CAUTION**

Allow light to cool prior to cleaning.

All surfaces can be cleaned with DURR FD333 cleaner.

Spray the cleaner (DURR FD333) on cloth and wipe the surfaces with the cloth.

Wipe all surfaces dry after cleaning.

## [11] MAINTENANCE AND INSPECTION

Guide for daily maintenance and inspection (Maintenance and inspection by user)

Management of maintenance and inspection of medical equipment should be implemented by the user (medical inspection). In case the user does not implement such management, it is permitted that such management is outsourced to a qualified entity such as a medical equipment repair company.

For safe use of this product, it is necessary that inspection should be conducted in the specified frequency on the items described below.

No.	Item	Frequency	Inspection Method and diagnosis	Influence if inspection is not conducted	Maintenance required in case of nonconformity
1	Appearance of Lens Cover	Before start	Check deformation, scratches by eyes	Deterioration of optical performance	Change a lens cover.
2	Light switch	Before start	Set Mode Selection switch to Manual. Confirms the light turns on.	Light doesn't function.	Contact your dealer or our office.
3	Touchless sensor	Before start	Set Mode Selection switch to Sensor. Confirms the light turns on.	Light doesn't function.	Clean the sensor surface.
4	Intensity switch	Before start	Change intensity.	It may cause the difficulty at dental practice.	Turn off the light. Contact your dealer or our office.
5	Movement of the trolley (Track light)	Before start	Check the movement of the trolley. Make sure the trolley run smoothly.	Light head doesn't stay at the desired position.	Contact your dealer or our office.
6	Track section (Track light)	Before start	Make sure that no wobble the track section when the product is operated.	There is a possibility that the light falls.	Contact your dealer or our office.
7	Functionality of Balance Arm	Before start	Swing the balance arm up/down. Swing the balance arm right/left. Make sure the balance arm stops and holds its position.	Light head doesn't stay at the desired position.	Adjust the tension of the balance arm. Follow instructions on page 17.
8	Vertical rotation of the Light head	Before start	Rotate the light head up/down. Make sure the light head stops and holds its position.	Light head doesn't stay at the desired position.	Adjust the tension of vertical rotation. Follow instructions on page 17.
9	Light head angle	Before start	Confirms the light head is vertically aligned.	Light head doesn't stay at the desired position.	Adjust the angle of the light head.
10	Light head rotation	Before start	Rotate the light head right/left. Make sure the light rotate 160° to each direction.	Light head rotates freely. This may cause the snapping of a wire.	Contact your dealer or our office.
11	Care exterior	Before start	Chemical and dirt on the product exterior must be cleaned.	Discoloration and deterioration to the exterior, and corrosion and rusting to metallic components may arise.	Executes wiping in accordance with "Cleaning Instructions"
12	Other 1	Once every week	Make sure that no abnormal noise occurs when the product is operated.	Light may not function right.	Turn off the light. Contact your dealer or our office.
13	Other 2	As needed	If the light has not been used for a long time, make sure the light functions correctly and safely.		If the light malfunctions, Contact your dealer.



## [12] ELECTROMAGNETIC COMPATIBILITY (EMC)

Medical electrical equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual.

Portable and mobile RF communications equipment can affect medical electrical equipment.


The equipment or system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the equipment or system should be observed to verify normal operation in the configuration in which it will be used.

Guidance and manufacture's declaration - electromagnetic emissions		
The 900 DENTAL LIGHT is intended for use in the electromagnetic environment specified below. The customer or the user of the 900 DENTAL LIGHT should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The 900 DENTAL LIGHT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The 900 DENTAL LIGHT is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacture's declaration - electromagnetic immunity			
The 900 DENTAL LIGHT is intended for use in the electromagnetic environment specified below. The customer or the user of the 900 DENTAL LIGHT should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm 6$ kV contact $\pm 8$ kV air	$\pm 6$ kV contact $\pm 8$ kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	$\pm 2$ kV for power supply lines $\pm 1$ kV for input/output lines	$\pm 2$ kV for power supply lines $\pm 1$ kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	$\pm 1$ kV differential mode $\pm 2$ kV common mode	$\pm 1$ kV differential mode $\pm 2$ kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	$<5\% U_T$ ( $>95\%$ dip in $U_T$ ) for 0.5 cycle $40\% U_T$ ( $60\%$ dip in $U_T$ ) for 5 cycle $70\% U_T$ ( $30\%$ dip in $U_T$ ) for 25cycle $<5\% U_T$ ( $>95\%$ dip in $U_T$ ) for 5 s	$<5\% U_T$ ( $>95\%$ dip in $U_T$ ) for 0.5 cycle $40\% U_T$ ( $60\%$ dip in $U_T$ ) for 5 cycle $70\% U_T$ ( $30\%$ dip in $U_T$ ) for 25cycle $<5\% U_T$ ( $>95\%$ dip in $U_T$ ) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the 900 DENTAL LIGHT requires continued operation during power mains interruptions, it is recommended that the 900 DENTAL LIGHT be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE $U_T$ is the a.c. mains voltage prior to applications of the test level.			

### Guidance and manufacture's declaration – electromagnetic immunity

The 900 DENTAL LIGHT is intended for use in the electromagnetic environment specified below. The customer or the user of the 900 DENTAL LIGHT should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz outside ISM bands <sup>a</sup>	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the 900 DENTAL LIGHT, including cables, than the recommended separation distance calculated from the equation applications to the Frequency of the transmitter.  <b>Recommended separation distance</b> $d = 1.2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz $d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz  Where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and $d$ is the recommended separation distance in metres (m).  Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, <sup>a</sup> should be less than the compliance level in each frequency range. <sup>b</sup>  Interference may occur in the vicinity of equipment marked with the following symbol:  

NOTE 1 At 80 MHz and 800MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by adsorption and reflection from structures, objects and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the 900 DENTAL LIGHT is used exceeds the applicable RF compliance level above, the 900 DENTAL LIGHT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the 900 DENTAL LIGHT.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.

#### Essential performance (purpose of IMMUNITY testing)

There is no essential performance.

<b>Recommended separation distances between Portable and mobile RF communications equipment and the 900 DENTAL LIGHT</b>			
The 900 DENTAL LIGHT is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the 900 DENTAL LIGHT can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the 900 DENTAL LIGHT as recommended below, according to the maximum output power of the communications equipment.			
<b>Rated maximum output power of transmitter W</b>	<b>Separation distance according to frequency of transmitter m</b>		
	<b>150 kHz to 80 MHz</b> $d = 1.2 \sqrt{P}$	<b>80 MHz to 800 MHz</b> $d = 1.2 \sqrt{P}$	<b>800 MHz to 2.5 GHz</b> $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1 At 80 MHz and 800MHz, the separation distance for the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by adsorption and reflection from structures, objects and people.			

## NOTE



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