

# DENTAL LIGHT 701

## INSTALLATION AND OPERATION INSTRUCTIONS

### IMPORTANT

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



 **Belmont**

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### 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 : -10 ~ 50°C

Humidity : 10 ~ 80%

Pressure : 600 ~ 1060 hpa

### Environmental condition for Transportation

Temperature : -10 ~ 50°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		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".
	Separate collection for electrical and electronic equipment		Refer to instruction manual/booklet				

 **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.
- Lamp bulb cover becomes very hot during use. To avoid burning fingers, do not touch lamp cover.
- Always put a lamp cover on to avoid burning fingers.
- Position a light head by holding light handle(s).
- Precautions in handling the patient mirror (Option).  
Do not give a strong shock etc.. This could cause injury.  
Do not remove the mirror frame from the light head. a patient mirror may fall and it may cause physical injury.
- 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**

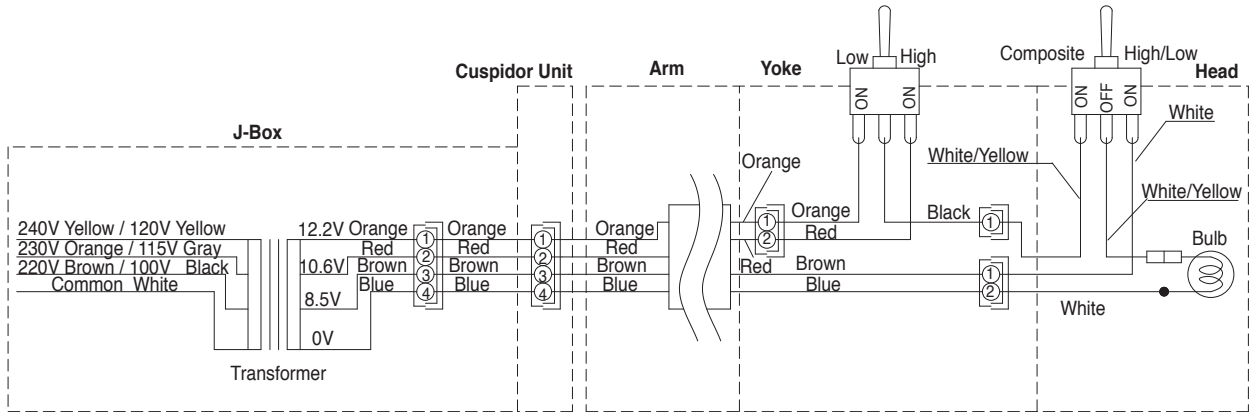
Warranty does not cover damage to equipment caused by disinfectant solutions

### **Replacement of parts (Except the Bulb and Lamp cover)**

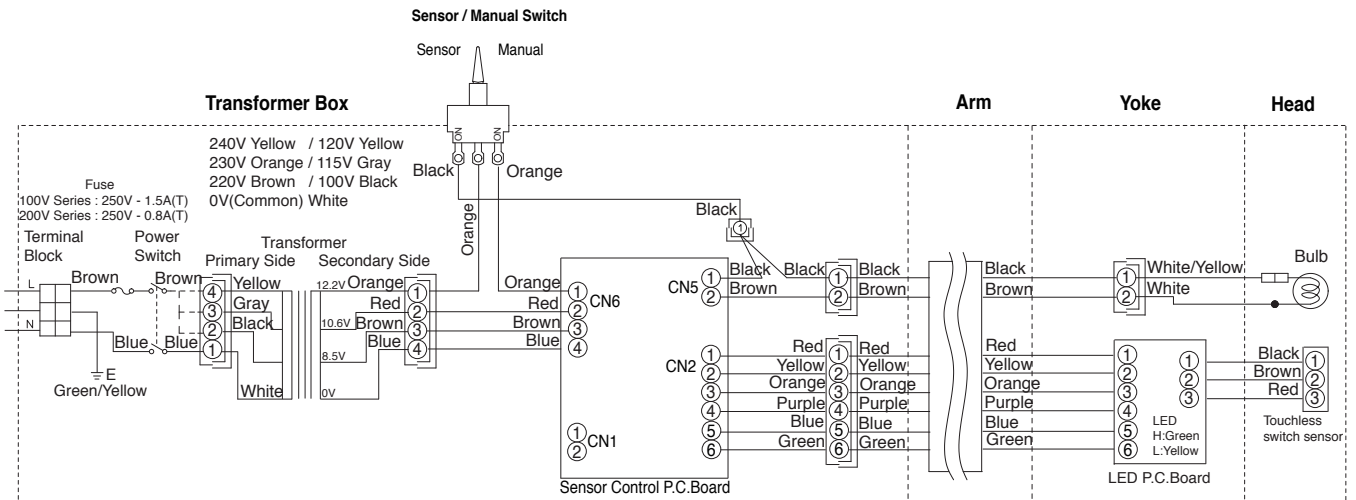
Replacement must be done by an professional technician(s) of our company or a company authorized by us.



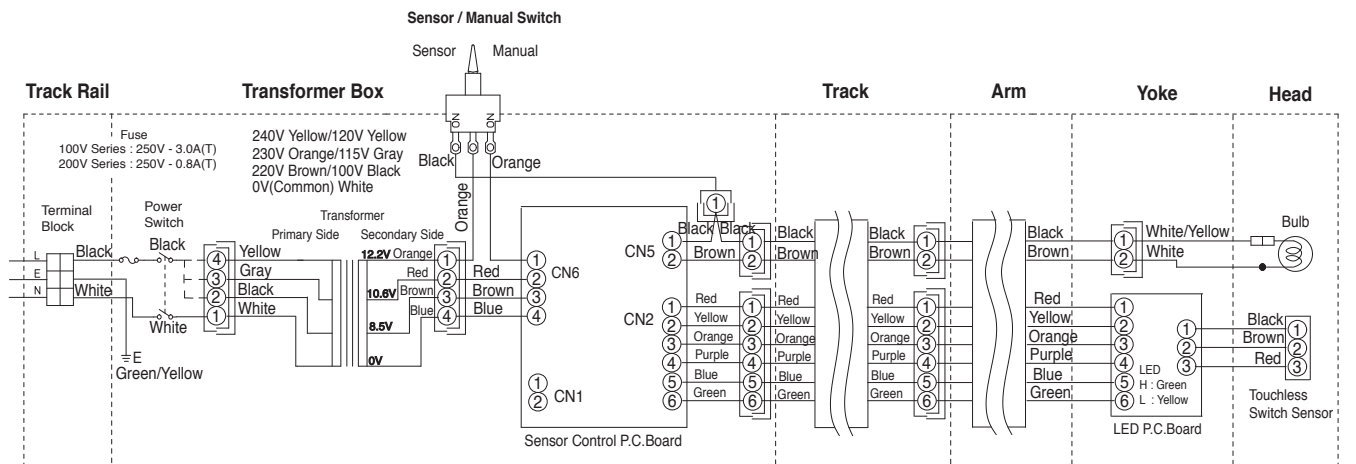
### 3-2. Unit Mount Type (AL-720M)



### 3-3. Ceiling Mount Type (AL-702S)



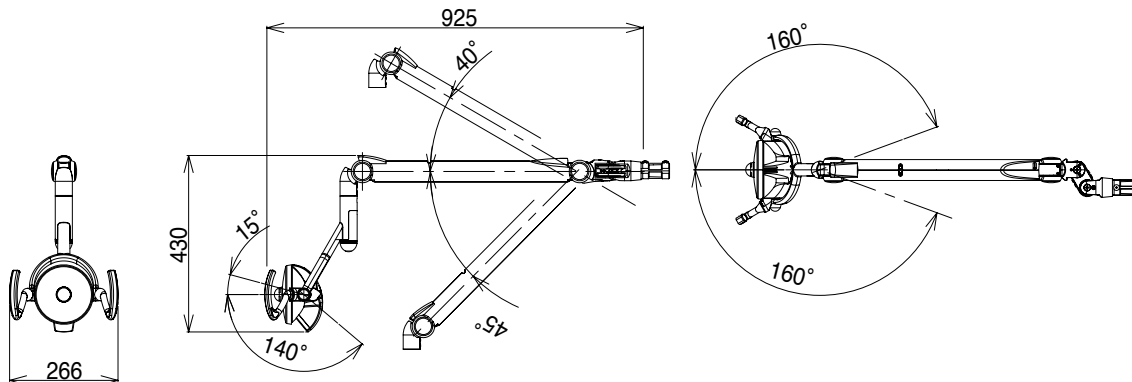
### 3-4. Track Mount Type (AL-705S)



# INSTALLATION INSTRUCTIONS

## [4] UNIT MOUNT TYPE (AL-720S / AL-720M)

### 4-1. Dimensions (mm)



### 4-2. Installation

Pass the light wires through the L-light pole and insert the light spigot into the L-light pole and fix it with 2 x M6 screws.  
(Refer to Fig.4-2)

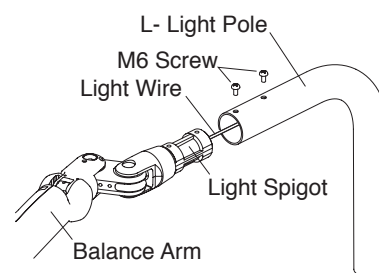


Fig.4-2 Fixing Light to L-Light Pole

## [5] LIGHT HEAD INSTALLATIONS(AL-702S / AL-705S)

Connect the light-head with the balance arm. (This section also applies to [6] Track type)

All necessary parts are included in the carton box.

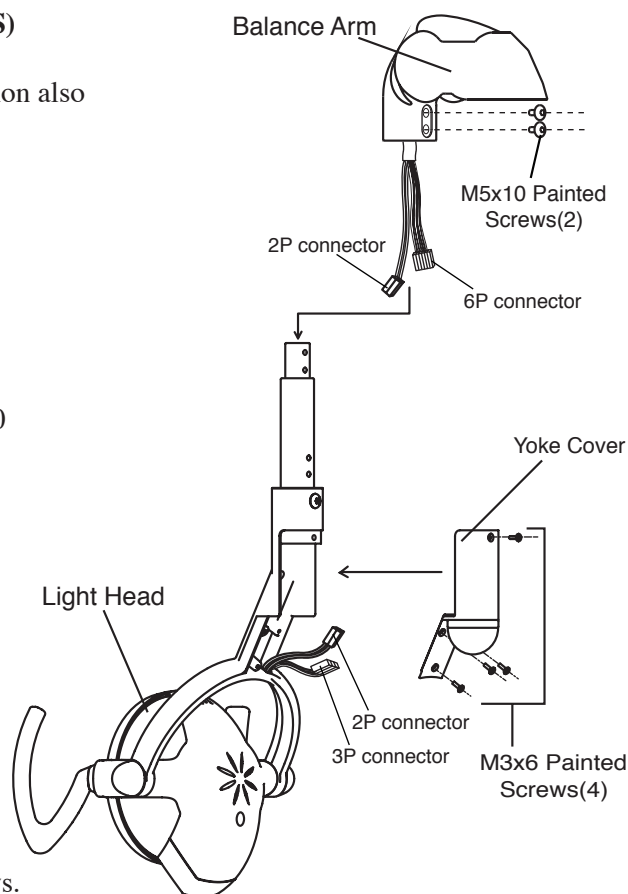
- M3 x 6 Painted Screw..... 4pcs.
- Yoke Cover..... 1pce.
- M5 x 10 Painted Screw..... 2pcs.

1) Install the light head to balance arm with two M5 x 10 painted screws.

2) Connect the wire harness.

- 2P connector : black / brown from balance arm to white / white & yellow from light head.
- 6P connector : red / yellow / orange / purple / blue / green from balance arm to LED P.C.Board in the yoke cover.
- 3P connector : black / brown / red from light head to LED P.C.Board in the yoke cover.

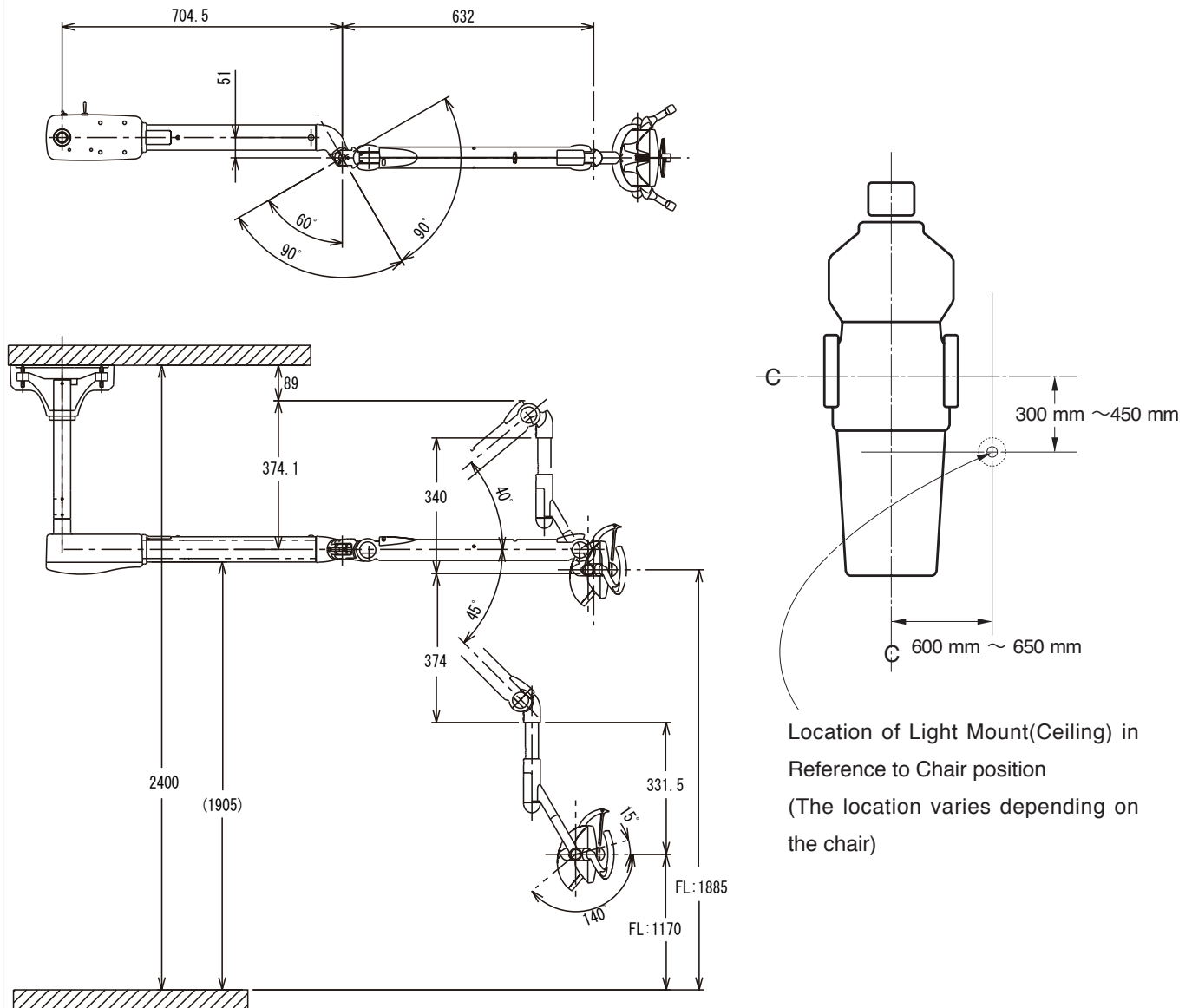
3) Attach the yoke cover with four M3 x 6 painted screws.





## [6] CEILING MOUNT TYPE (AL-702S)

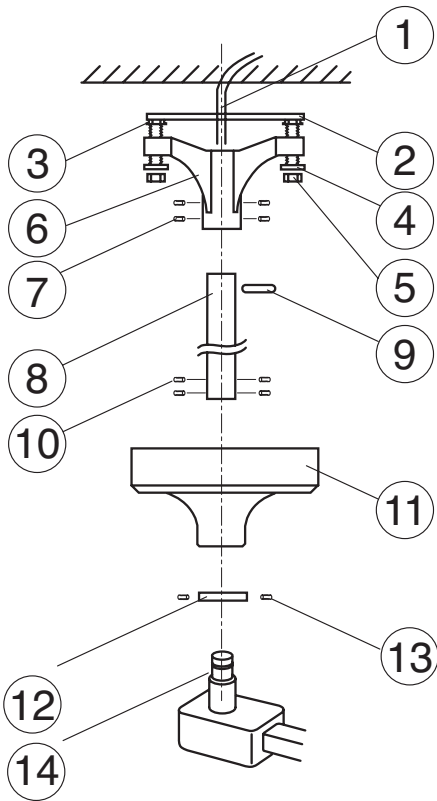
### 6-1. Dimensions (mm)



### 6-2. Installation Instructions

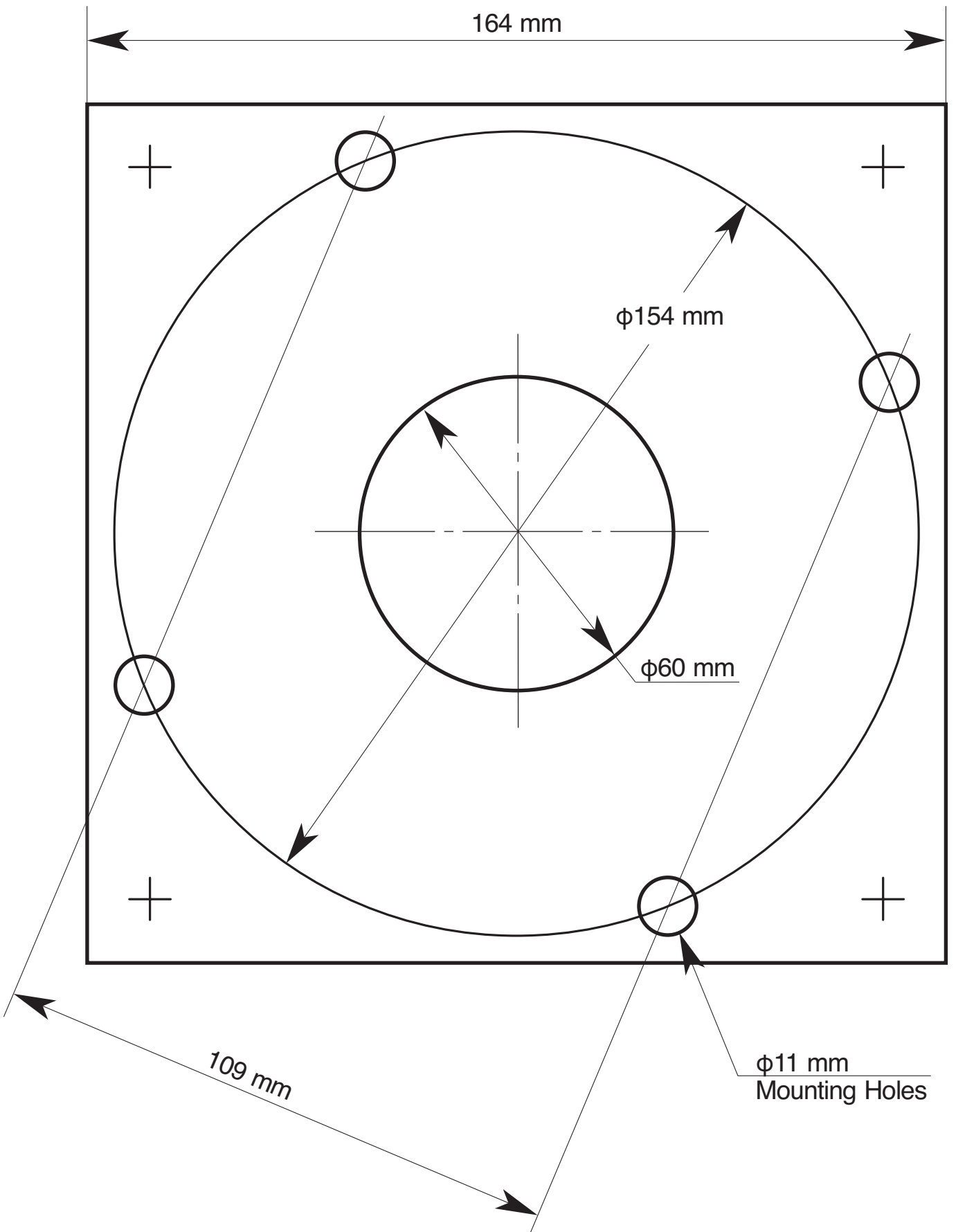
- 1) Secure mounting plate to the ceiling, using the parts which will give the equipment enough structural strength.
- 2) Route the power supply cable (1) through the center of the mounting plate(2).
- 3) Insert the suspension tube(8) into the ceiling flange and secure with roll pin(9) and set screws(7) supplied.
- 4) Use a level to make certain suspension tube is plumb.
- 5) Slide the flange cover(11) and flange cover ring(12) (flat side up) over the suspension tube and secure about half way up the tube. Use only one set screw(13) as you will be moving this on final installation.
- 6) Install the light assembly to the suspension tube by first running the 3 wire cord from the light up through the suspension tube to the ceiling flange.  
Secure light assembly to suspension tube with 4 Allen set screws.

- 7) Connect the power supply cable to the 3 wire cord from the light assembly.
- 8) Test light for proper operation.
- 9) Reposition flange cover and secure with flange cover ring - Secure all set screws.



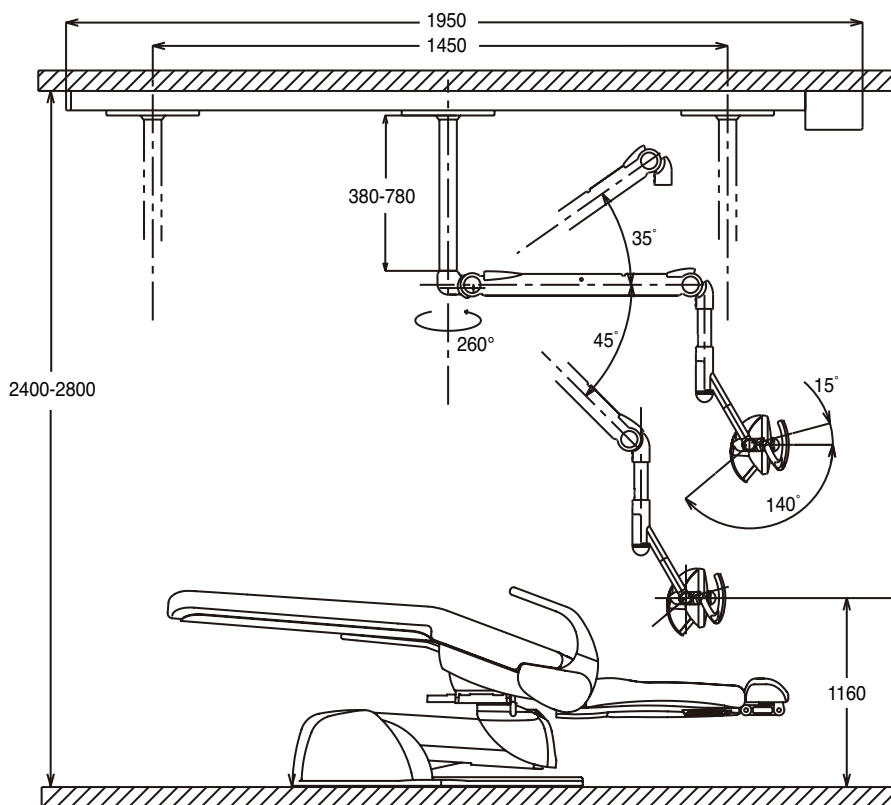
- (1) Power Supply Cable
- (2) Mounting Plate
- (3) Leveling Nut (M8 : 4pcs)
- (4) Washer (M8/Plain Washer / M8/Spring Washer : 4pcs)
- (5) Nut (M8 : 4pcs)
- (6) Ceiling Flange
- (7) Socket Screw for Flange (M6x 8 : 4pcs)
- (8) Suspension Tube
- (9) Roll Pin (6 x 70 : 1pce)
- (10) Socket Screw for Arm (M5 x 8 : 4pcs)
- (11) Flange Cover
- (12) Cover Ring
- (13) Socket Screw for Ring (M5 x 8 : 3pcs))
- (14) Light Assembly

6-3.AL-702S CEILING MOUNTING TEMPLATE



## [7] TRACK MOUNT TYPE (AL-705S)

### 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 can not be overemphasized. In general, a ceiling structure capable of supporting 90kg(200 lbs) dead weight is required.

- 1) In conventional ceilings with joists perpendicular to center line of light, attach pallet by at least 6 (M8 x 76mm)lag screws. Suitable holes are provided in pallet for most installations, utilizing 16"(406 mm) or 12"(305 mm) center to center ceiling joists. For other spacings or locations, additional holes can be drilled in pallet.

(Refer to Fig.7-2-1)

**IMPORTANT:Locate transformer end of track at headrest end of chair only.**

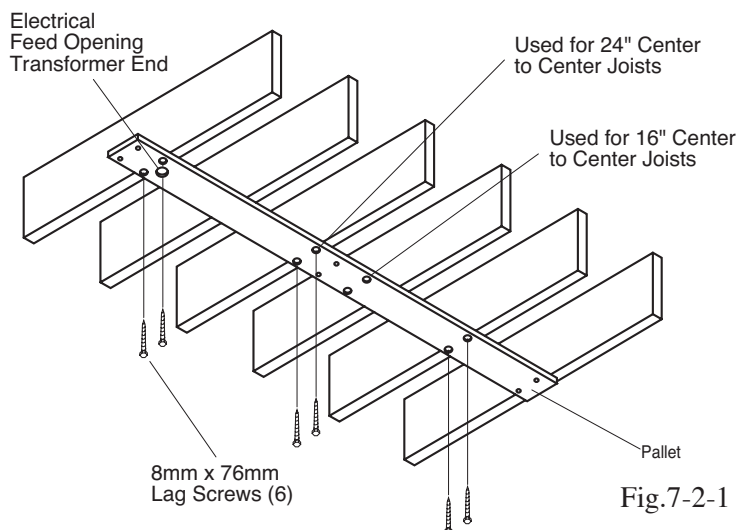
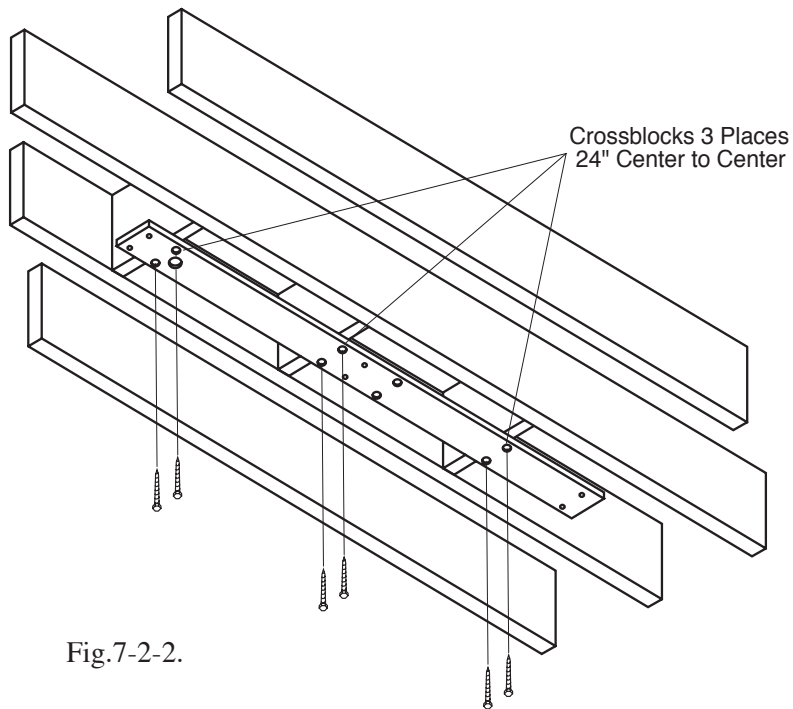
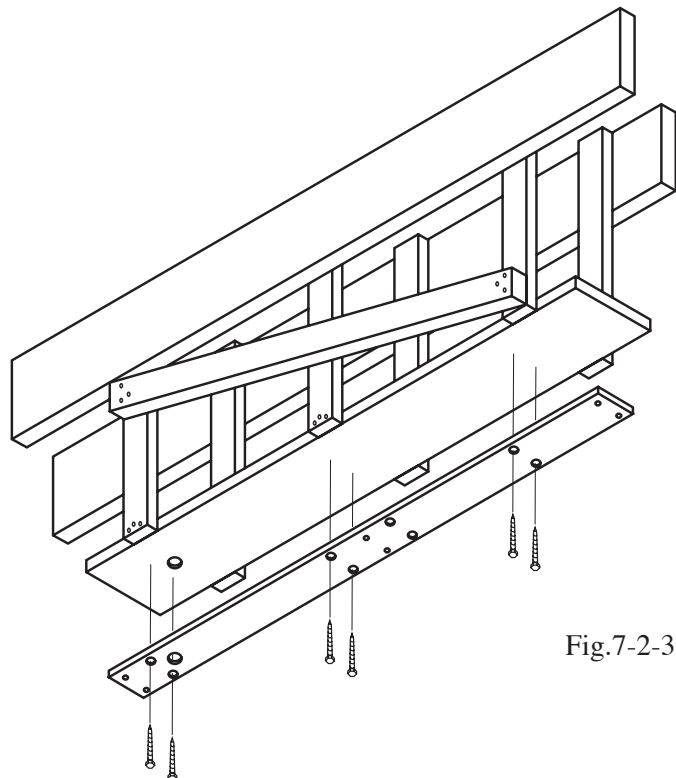


Fig.7-2-1

- 2) For conventional ceilings with joists parallel to center line of light, cross blocks must be installed in 3 places to allow mounting with at least 6 (M8 x 76mm) lag screws.  
(Refer to Fig.7-2-2.)

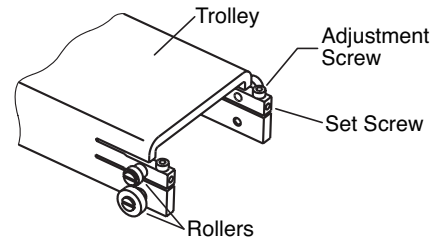


- 3) For suspended ceilings, appropriate rigid structure must be attached to ceiling framework to provide 90kg(200 lbs.) dead weight capacity. (Refer to Fig.7-2-3.)



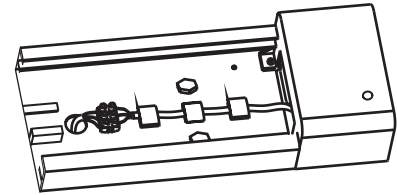


11) Check operation of trolley. It is factory adjusted to provide smooth effortless travel, without play; however rollers can be readjusted if necessary. Loosen set screw and adjust socket cap screw to vary roller clearance.



12) Unpack transformer / housing assembly and mount to track with screws (M4x15 Screw with plain washer & spring washer : 2pcs) provided.

13) Attach pigtail leads to corresponding power line wires at terminal block. Retain wires under plastic clip.



14) Connect plug-in transformer connector to trolley wire harness.

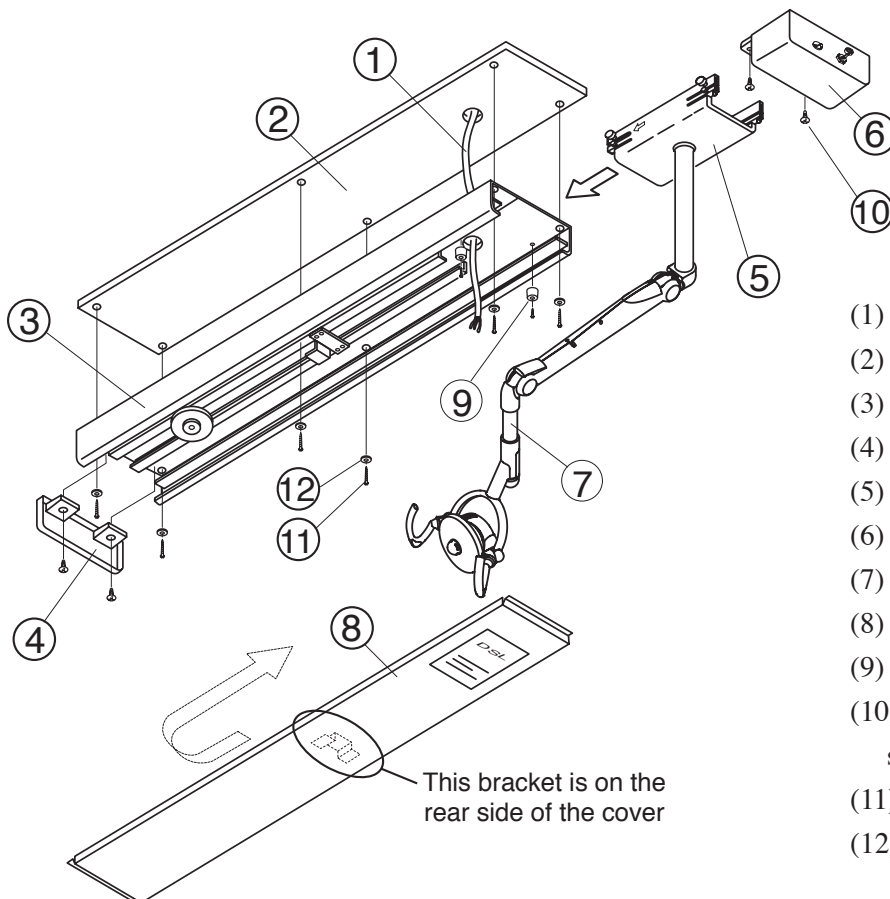
15) Carefully slide bottom cover onto track from the end on the opposite side of the transformer end. Be sure to engage lip inside of the bottom covers onto the Z bracket on the track.

16) Install end-cap with screws (Screw with plain washer & spring washer M4x15 : 2pcs) provided.

17) Slide trolley back and forth checking for binding or rubbing.

18) Confirm that balance arm is properly adjusted to stay where it is placed. If necessary, move head up or down to expose appropriate cross drilled nut and adjust with tool provided. (See Page 13, adjusting tension of balance arm.)

19) Turn on power and check electrical operation of light.



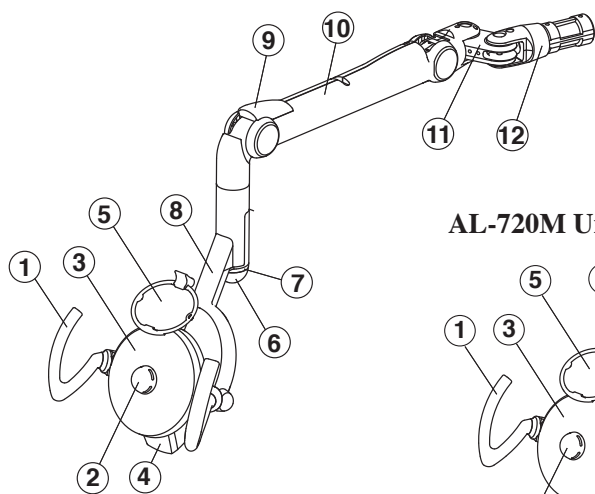
- (1) Power supply cable
- (2) Pallet
- (3) Track
- (4) End-cap
- (5) Trolley
- (6) Transformer Box
- (7) Light Assembly
- (8) Bottom Cover
- (9) Rubber bumper(4pcs)
- (10) Screw with plain washer & spring washer M4x15(2 pcs)
- (11) Hex Head Bolt M8x25(6 pcs)
- (12) Spring Washer M8 (6 pcs)

This bracket is on the rear side of the cover

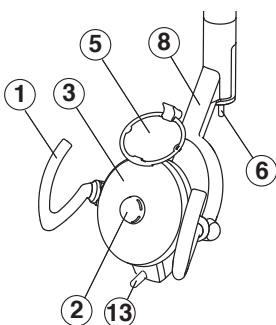
## [8] OPERATING INSTRUCTIONS

### 8-1. Overall View and Major Components

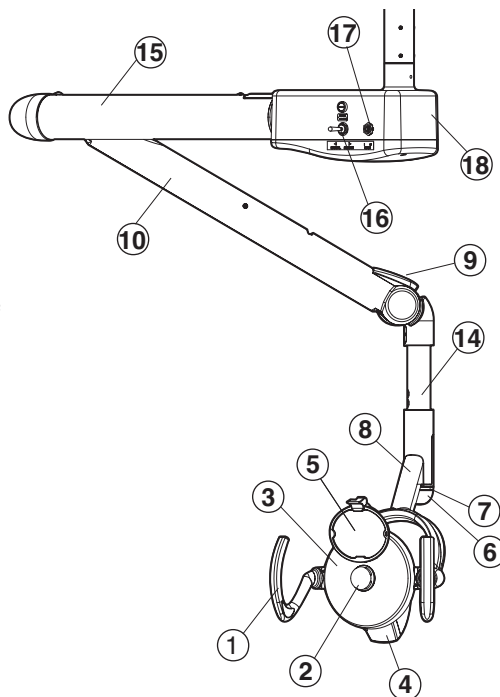
AL-720S Unit Mount Type



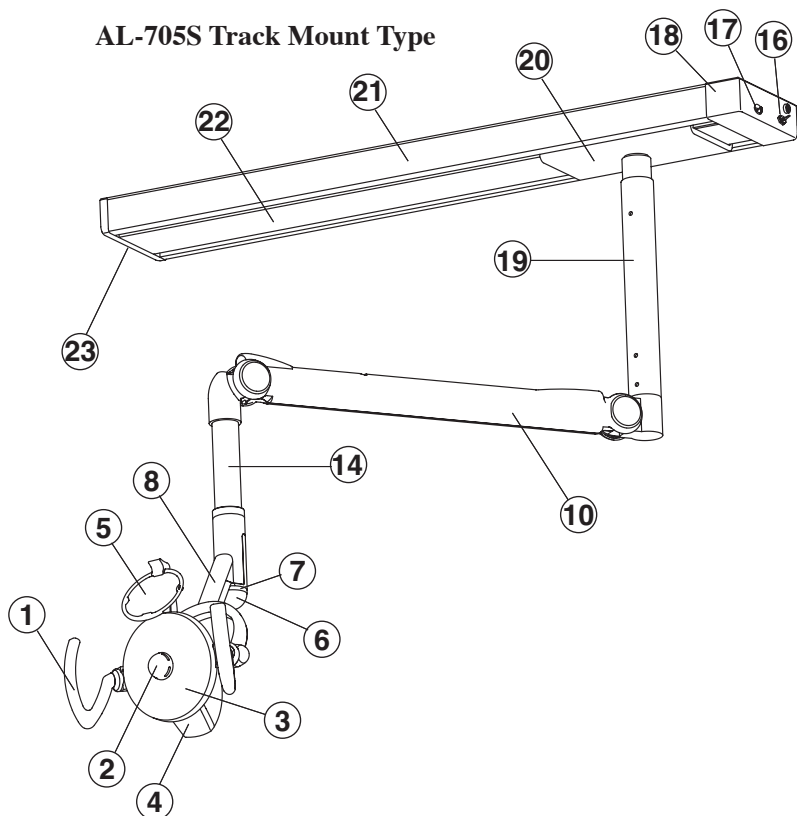
AL-720M Unit Mount Type



AL-702S Ceiling Mount Type



AL-705S Track Mount Type



- (1) Handle
- (2) Bulb Cover
- (3) Front Shield
- (4) Touchless Switch
- (5) Patient Mirror(Optional)
- (6) Intensity Switch
- (7) LED
- (8) Yoke
- (9) Arm Rubber Cover
- (10) Balance Arm
- (11) H-Bracket
- (12) Spigot
- (13) Manual Switch
- (14) Extension
- (15) Swing Arm
- (16) Mode Selection Switch
- (17) Main Switch
- (18) Transformer Box
- (19) Track Pole
- (20) Trolley
- (21) Track
- (22) Bottom Cover
- (23) End Cap

#### **⚠ CAUTION**

CAUTION-Electric shock hazard, do not remove cover. Refer servicing to qualified service personnel



## 8-2 Operation (Sensor Type AL-720S / AL-702S / AL-705S)

### 8-2-1. Main Switch (AL-702S / AL-705S)

Flip the toggle switch to the side marked with ' I ' to turn on the light.

(Refer to Fig.8-2-1)

I - ON / O - OFF

### 8-2-2. Mode Selection Switch (AL-702S / AL-705S)

(Refer to Fig.8-2-1)

Switching modes can be changed by this switch.

Sensor : Touchless mode ON/OFF

Manual : Manual mode ON (only)

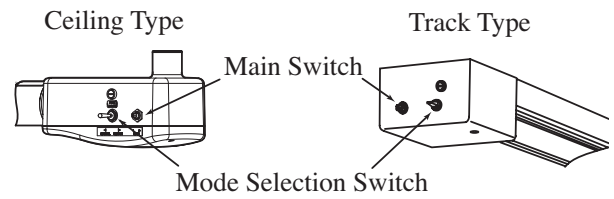


Fig.8-2-1 Main & Mode Selection Switch

### 8-2-3. Touchless Switch (AL-720S / AL-702S / AL-705S)

(Refer to Fig.8-2-2 & 8-2-3)

Approach a hand to touchless switch within the reaction zone to turn on/off for the light.

To change the light intensity into composite mode, approach a hand to touchless switch and stay the hand there for about 2 seconds. Green or Amber LED blinks.

To return to the original light intensity, repeat the same procedure.(Reaction zone : 0 - 85mm)

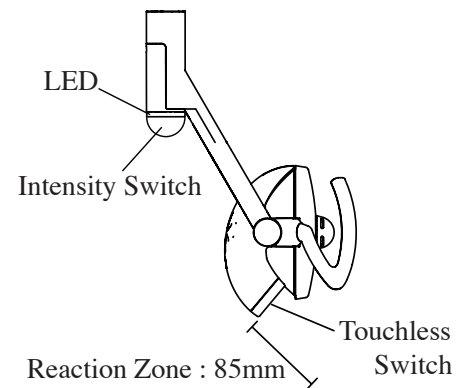


Fig.8-2-2 Model 720S / 702S / 705S

### 8-2-4. Intensity Switch (AL-720S / AL-702S / AL-705S)

(Refer to Fig.8-2-3)

Push intensity switch

High beam : Green LED turns ON.

Low beam : Amber LED turns ON.

	Light Intensity	LED
High	28,000Lux	Green
Low	18,000Lux	Amber
Composite	8,000Lux	Blink

Fig.8-2-3

## 8-3 Operation (Manual Type AL-720M)

### 8-3-1. Intensity Switch (AL-720M)

(Refer to Fig.8-3)

High beam ; Push toggle to left

Low beam ; Push toggle to right

### 8-3-2. Manual Switch (AL-720M)

(Refer to Fig.8-3)

High (Low) beam ; Push toggle to left

Composite Mode beam ; Push toggle to right

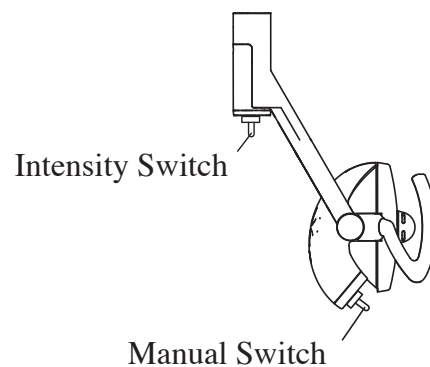


Fig.8-3 Model 720M

## [9] ADJUSTMENTS

### 9-1. Adjusting Tension of Balance Arm

Use slot A when making adjustment for upward / downward drifting of balance arm.

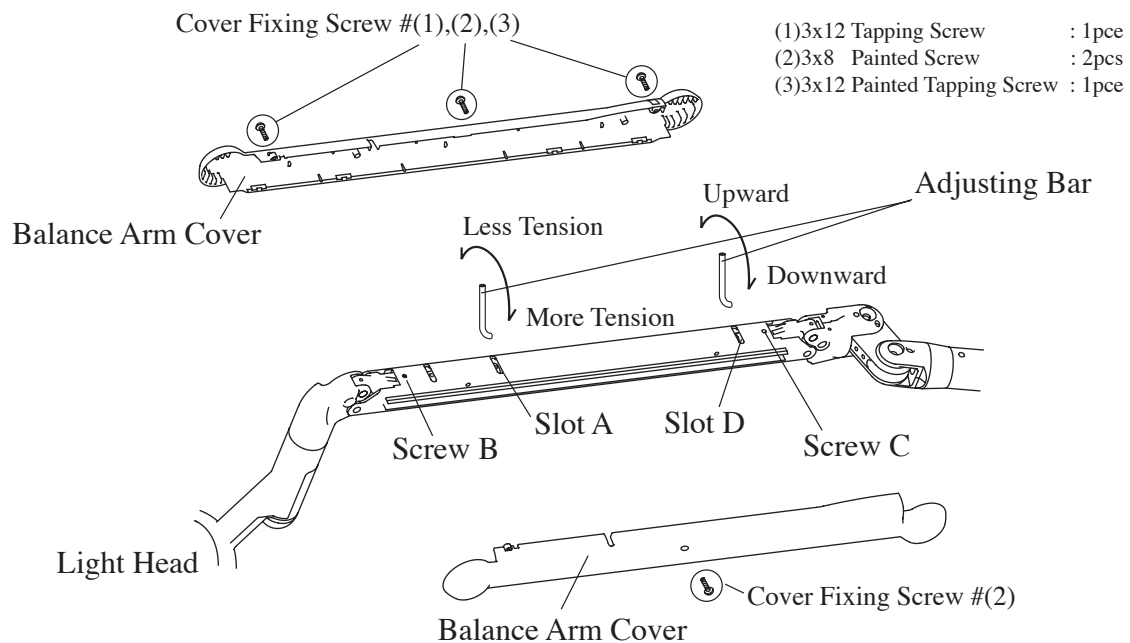
Insert adjusting bar into slot A on top of balance arm, turn spring adjustment nut clockwise for more tension ; counterclockwise for less tension.

### 9-2. Adjusting Angle of Light Head

Use slot D when adjusting light head angle. Remove four cover fixing screws and the balance arm covers. Lift the balance arm to upmost position, and hold it. Loosen screw B and C.

Insert adjusting bar into slot D on top of the balance arm, turn spring adjustment nut clockwise for downward angle ; counterclockwise for upward angle.

After adjustment, tighten the screw B,C and reattach the balance arm cover.



## [10] HALOGEN LAMP REPLACEMENT

### **⚠ CAUTION**

Make sure the power supply is turned off.

Halogen bulb and surrounding parts may be hot immediately after the lamp goes off.

Wait until all parts are cool before changing bulb.

### **IMPORTANT**

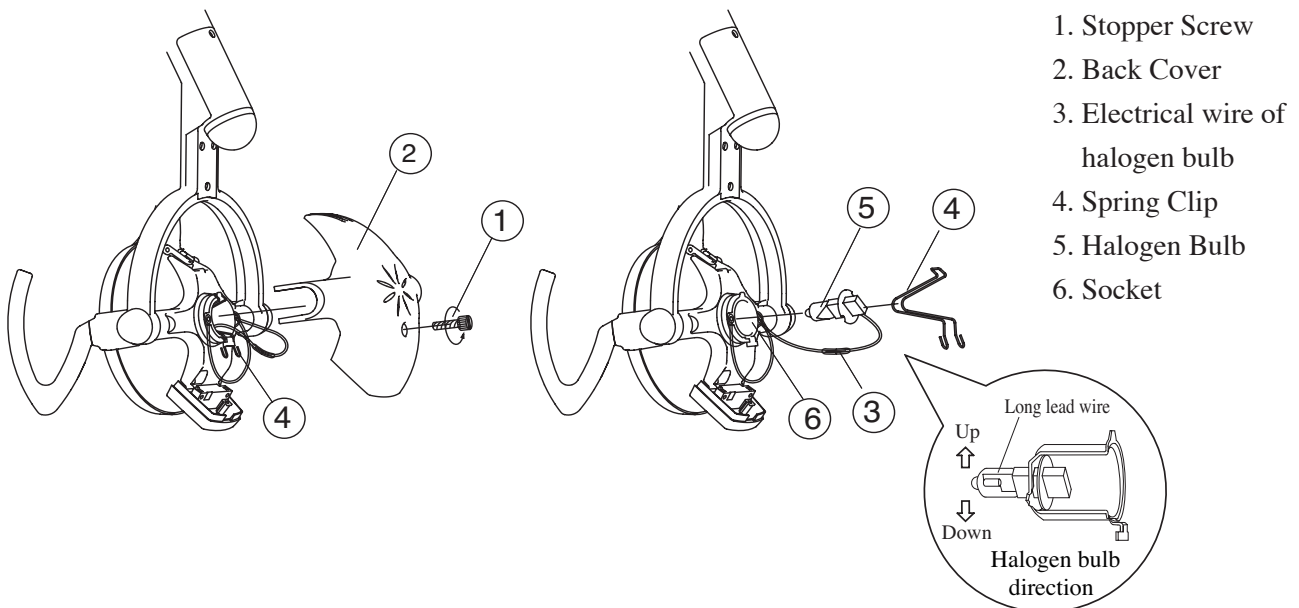
Do not touch light bulb glass with bare hand.

Halogen bulb surface must be clean.

Oil or body moisture will affect bulb life.

If glass surface is touched, clean with it alcohol.

- 1) To install replacement halogen bulb, turn off the light off and remove the back cover by loosening stopper screw.
- 2) Disconnect the electrical connector of halogen lamp.
- 3) Unlock the spring clip and pull the electrical wire of halogen bulb to remove the halogen bulb from socket.
- 4) Attach the electrical wire of new halogen lamp and insert halogen lamp into socket.
- 5) After new halogen lamp is seated in housing, insert and lock the spring clip into position.
- 6) Reattach the back cover.



**⚠ CAUTION**

Replace halogen lamp only with type JA-12V55WD/DL8 obtainable through your local dealer or contact Belmont Equipment.

**[11] CLEANING**

**⚠ CAUTION**

Allow light to cool prior to cleaning.

**⚠ CAUTION**

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.

**REFLECTOR :** Extreme care should be taken to prevent scratching reflector surfaces, as this will degrade the performance of the light.

## [12] INFORMATION FOR YOUR SAFETY

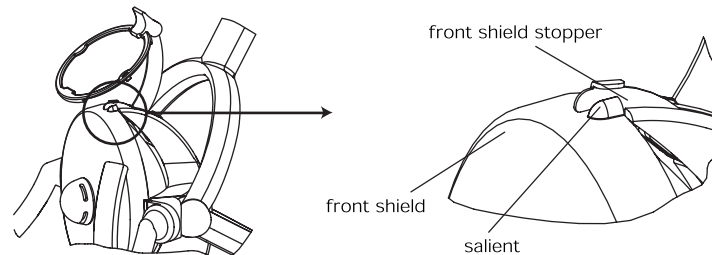
Confirming the proper installation of the front shield to the light head

### ⚠ CAUTION

Before operation, make certain that the front shield is firmly inserted into the slots located at the feet of the both, right and left, handles. Also confirm the front shield is appropriately hooked and held with a front shield stopper. If these conditions are not fulfilled, the shield may become loose and drop.

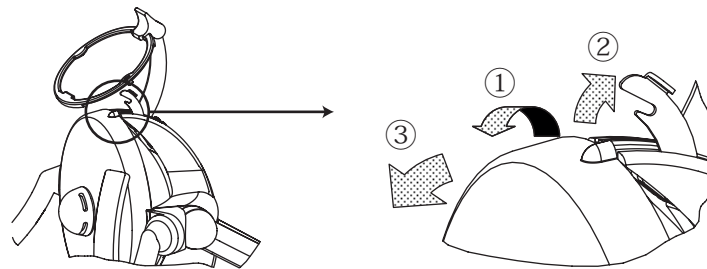
#### 12-1. Front shield properly secured

When a shield is properly secured, a salient on the front shield can be seen at the right of the stopper when viewed from the front. It can also be confirmed that the stopper holds the edge of the shield from up and down.



#### 12-2. Front shield imperfectly attached

If the edge of the shield is pulled back slightly at the point where the stopper holds it ( ① ), then the stopper is raised ( ② ), the shield goes loose. Under this condition, if the front shield is turned counterclockwise ( ③ ), the shield will be detached.

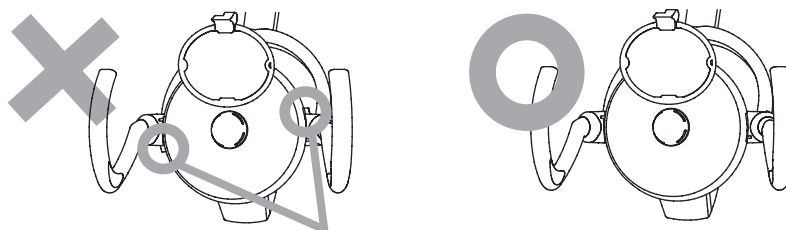


#### 12-3. If this should happen, the shield can be reinstalled to the light head by :

- Inserting the two protruding parts ( not the salients mentioned above ), which are located at right and left edges of the shield, into the designated slot at each foot of the handle, then turning the shield clockwise, and
- Lowering the front shield stopper to hold the edge of the shield from up and down while pulling back the shield slightly.

#### 12-4. Confirming the proper installation of the front shield to the light head

Make certain the front shield is firmly inserted into the slots located at the feet of the both, right and left, handles. Also confirm the front shield is appropriately hooked and held with a front shield stopper from up and down.





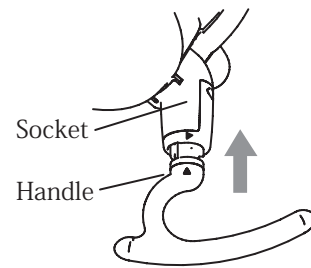
Front shield imperfectly attached to the light head


Front shield securely installed to the light head

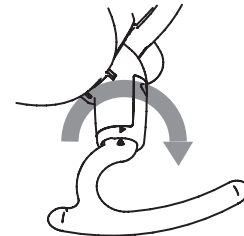
### [13] HOW TO ATTACH AND REMOVE HANDLES (OPTION)

#### 13-1. Attaching a handle

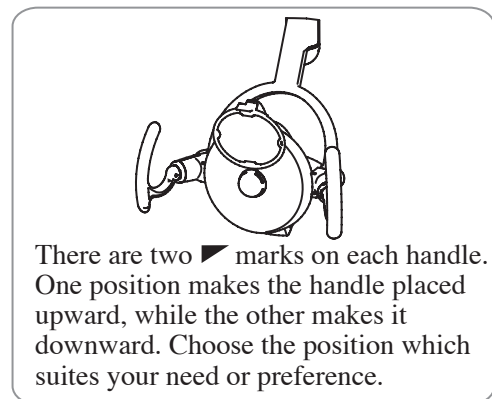
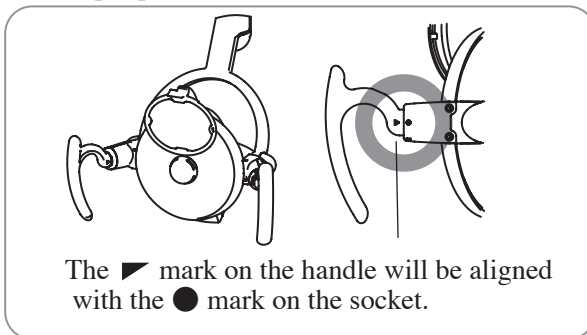
1) Insert a handle into the socket of the light head, aligning the  mark on the handle with the  mark on the socket.



2) Push the handle all the way in (the  mark on the handle should come to the edge of the socket), then turn it clockwise. When the handle reaches its proper position, it clicks. Now the handle is fixed.



Proper position of the handle when inserted





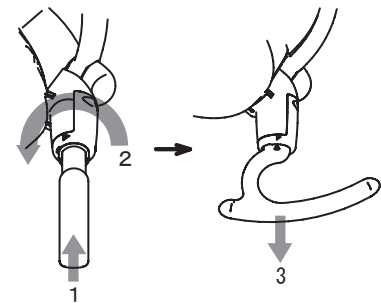
**Make sure that both handles are securely attached to the socket.**

#### **WARNING**

If the handles are not secured properly to the sockets, they may become loose and fall off.

#### 13-2. Detaching a handle

While pushing the handle all the way in, turn it counterclockwise until the mark on the handle () and the one on the socket () meet. Then pull off the handle from the socket.

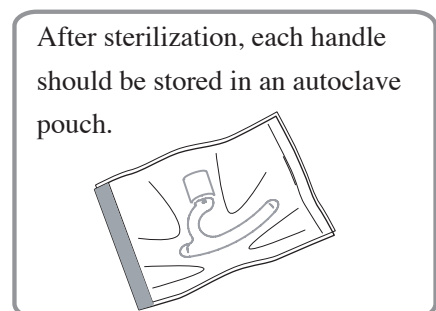


#### 13-3. Proper sterilization and storage

- 1) Handles should be sterilized with high-pressure steam of the autoclave.
- 2) Keeping handles under an ultraviolet germicidal lamp will cause discoloration and deterioration.  
(After sterilization, please store the handle in an autoclave pouch.)

#### **WARNING**

Do not keep the handles under an ultraviolet germicidal lamp. It will cause discoloration and deterioration.



## [14] MAINTENANCE AND INSPECTION

### 14-1. 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 Lamp Cover	Before start	Check deformation, scratches by eyes	Deterioration of optical performance	Change a lamp cover
2	Mirror cover is firmly attached or not	Before start	Pull the lamp cover. Make sure that the Mirror cover doesn't fall	Mirror cover may fall.	Reattach a Mirror cover
3	Light bulb	Before start	Check whether the light brinks or not due to the poor connection.	Light bulb turns very hot. This could shorten bulb life.	Securely insert a light bulb into the bulb holder
4	Light switch	Before start	Set Sensor/Manual switch to Manual. Confirms the light turns on.	Light doesn't function.	Replace a light bulb
5	Touchless sensor	Before start	Set Mode Selection switch to Sensor. Confirms the light turns on.	Light doesn't function.	Clean the sensor surface.
6	Intensity switch	Before start	Change intensity.	It may cause the difficulty at dental practice.	Turn off the light. 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.
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.
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	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.
12	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.
13	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"
14	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
15	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 or our office

## 14-2. Guide for Periodical Check-up

- Some parts and components of the products are degraded or deteriorated depending on the frequency of use. Annual check-up and maintenance, as well as replacement of consumable parts, are required.
- The required parts (including consumable parts) are listed below. It may be different from the following list depending on the option of the light.
- For check-up and repair, call a technician of our authorized dealer.

### Parts and components that require periodical check-up

No.	Parts Description	Standard Lifetime	No.	Parts Description	Standard Lifetime
1	Moving part	7 years	3	Switches	5 years
2	Electric wiring of moving part	5 years	4	Control PCBs.	5 years

### Consumable parts

No.	Parts Description
1	Bulb
2	Lamp Cover
3	Fuse
4	Handle (Option detachable handle)



**WARNING**

Execute the maintenance in accordance with this instruction manual and operating manual attached to each individual equipment ( Dental unit, Handpiece, etc..).  
Failure to maintain this product may lead to physical injury or property damage.

## [15] BEFORE ASKING FOR REPAIRS

If any of phenomena described below has occurred, make the following checks before asking for repairs.

Phenomenon		Check point and result	Action to be taken
The light does not light up.	When an indicator is not displayed.	Unit main switch is not on.	Turn on the unit main switch.
		Dental light main switch is not on.	Turn on the dental light main switch to " I " mark.
	When the indicator is on.	Light bulb had been burned out.	Replace with a new light bulb. Refer to halogen bulb changing section in this manual.
		Wrong light bulb is used.	Use specified light bulb described in specification section in this manual.
		Touchless sensor surface is dirty.	Clean the touchless sensor surface.
		Confirm distance of a touchless switch.	Hand must pass by within 65mm from the touchless sensor.

If the dental light does not normally work even if actions were taken upon checkup stated above, then stop using the unit, turn off the main switch and contact your dealer or our office.

## [16] 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.


<b>Guidance and manufacture's declaration - electromagnetic emissions</b>		
The 701 is intended for use in the electromagnetic environment specified below. The customer or the user of the 701 should assure that it is used in such an environment.		
<b>Emissions test</b>	<b>Compliance</b>	<b>Electromagnetic environment - guidance</b>
RF emissions CISPR 11	Group 1	The 701 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 701 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	

<b>Guidance and manufacture's declaration - electromagnetic immunity</b>			
The 701 is intended for use in the electromagnetic environment specified below. The customer or the user of the 701 should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
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 701 requires continued operation during power mains interruptions, it is recommended that the 701 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 701 is intended for use in the electromagnetic environment specified below. The customer or the user of the 701 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
<p>Conducted RF IEC 61000-4-6</p>	<p>3 Vrms 150 kHz to 80 MHz outside ISM bands<sup>a</sup></p>	<p>3 Vrms</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the 701, including cables, than the recommended separation distance calculated from the equation applications to the Frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> $d = 1.2 \sqrt{P}$
<p>Radiated RF IEC 61000-4-3</p>	<p>3V/m 80 MHz to 2.5 GHz</p>	<p>3 V/m</p>	<p><math>d = 1.2 \sqrt{P}</math> 80 MHz to 800 MHz <math>d = 2.3 \sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>Where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in metres (m).</p> <p>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></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> <div style="text-align: center;">  </div>

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 701 is used exceeds the applicable RF compliance level above, the 701 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the 701.

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.

**Recommended separation distances between  
Portable and mobile RF communications equipment and the 701**

The 701 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the 701 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the 701 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
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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