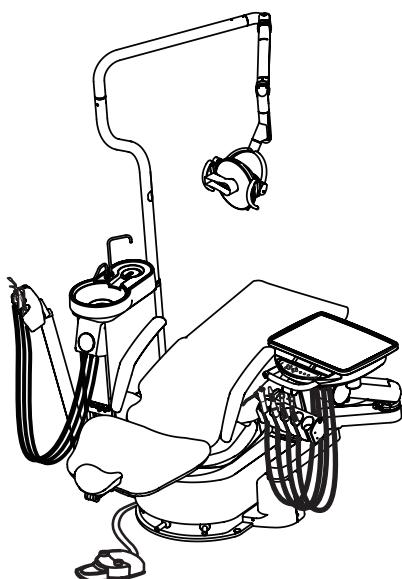


DENTAL UNIT AND CHAIR

SP  
CLEO II

**INSTALLATION INSTRUCTIONS**



**Belmont**

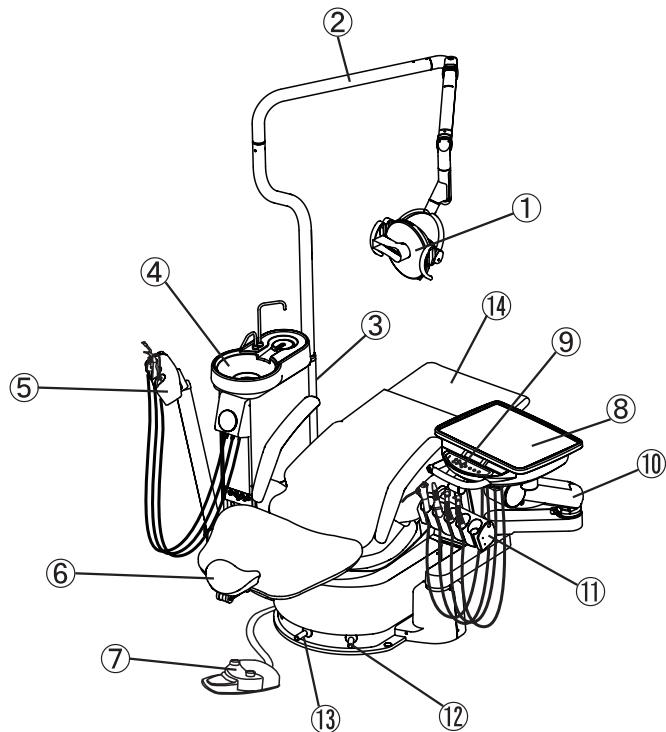
## TABLE OF CONTENTS

Page

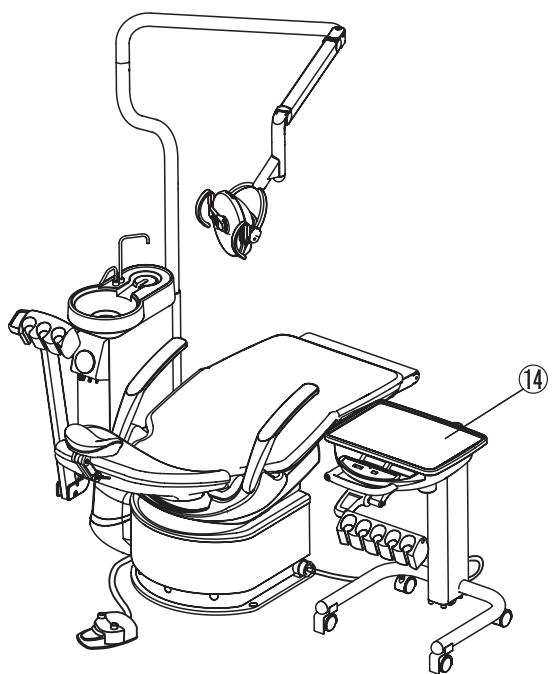
1. Overview and major components-----	1
2. Dimentions and specifications	
2-1. Dimentions -----	2
2-2. Specifications -----	3
3. Installation instructions	
3-1. Pre-installation Requirements -----	4
3-2. Unpacking -----	7
3-3. Installation of Chair Base -----	7
3-4. Installation of J-Box Assembly-----	7
3-5. Installation of Stop Valve and Power Supply Line-----	8
3-6. Installation of Doctor Table -----	9
3-7. Installation of Cuspidor Unit-----	9
3-8. Installation of Utility Section -----	10
3-9. Installation of Dental Light Section -----	12
3-10. Installation of Chair Section -----	14
4. Sensor Cupfiller (Option)-----	16
5. Hydraulic diagram for chair -----	17
6. Electrical diagram for chairr -----	18
7. Flow diagram for unit	
7-1. A Spec.-----	19
7-2. E Spec.-----	20
7-3. Cuspidor -----	21
8. Electrical diagram for unit	
8-1. J-Box (115V)-----	22
8-2. J-Box (220V,230V,240V) -----	23
8-3. Cuspidor -----	24
8-4. Dr Table (A Spec.)-----	25
8-5. Dr Table (E Spec.)-----	26
9. Electrical diagram for Dental Light	
9-1. AL-720S (115V)-----	27
9-2. AL-720S (220V,230V,240V)-----	28
9-3. AL-820S (115V)-----	29
9-4. AL-820S (220V,230V,240V)-----	30
9-5. AL-520S (115V)-----	31
9-6. AL-520S (220V,230V,240V)-----	32
9-7. 900 Dental Light (Type 920)-----	33

## 1. OVERVIEW AND MAJOR COMPONENTS

Base Mount Type



Split Cart Type

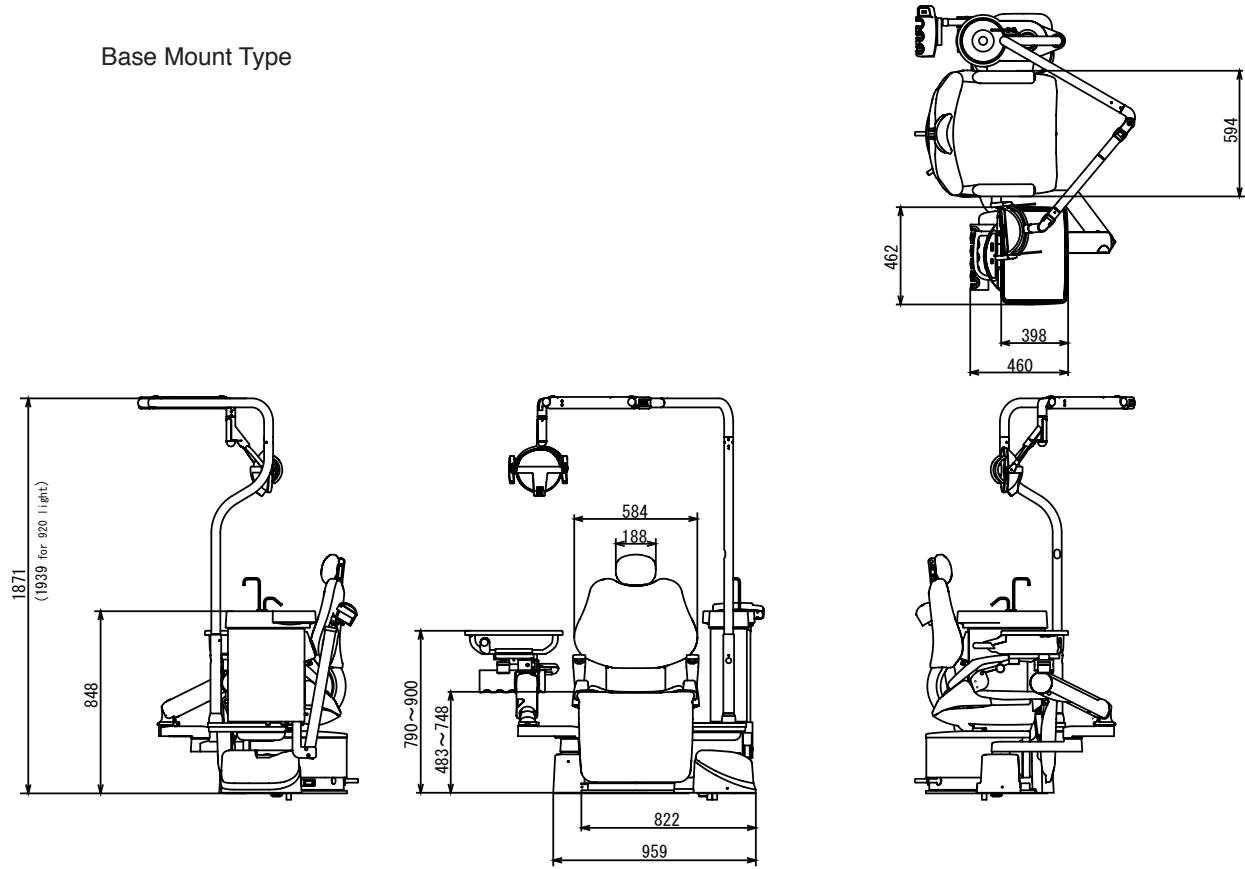


1. Dental Light
2. Horizontal Arm for Dental Light
3. Dental Light Pole
4. Cuspidor Bowl
5. Assistant Holder
6. Twin Axis Headrest
7. Foot Control
8. Doctor Table
9. Main Control Switch
10. Balance Arm
11. Handpiece Holder
12. Stick Switch(Manual Mode)
13. Stick Switch(Auto Mode)
14. Cart Type Doctor Unit

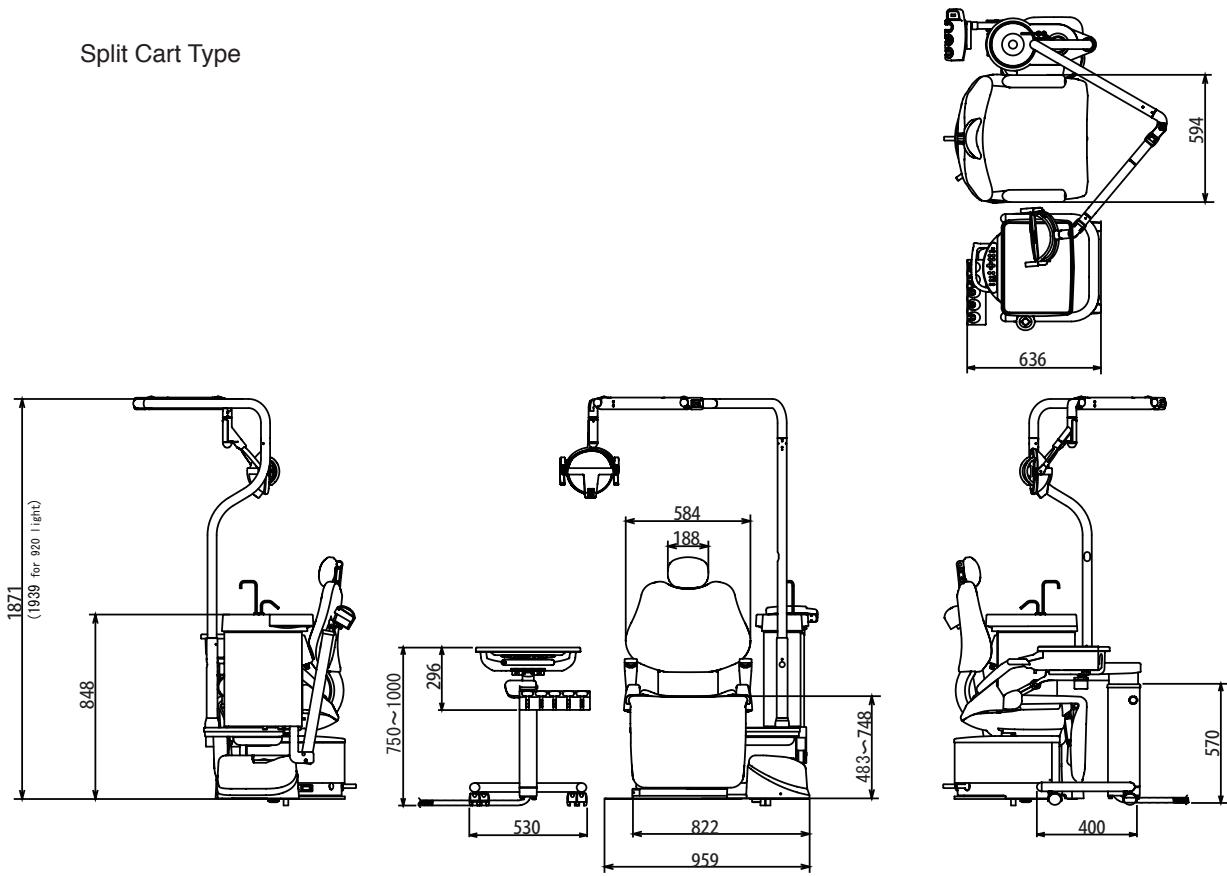
## 2. DIMENSIONS AND SPECIFICATIONS

### 2-1. Dimensions

Base Mount Type



Split Cart Type



## **2-2. Specification**

Power consumption ; AC.115V	7.7A/6.3A	50/60Hz
AC.220V	3.5A/3.5A	50/60Hz
AC.230V	3.4A	50Hz
AC.240V	3.5A	50Hz
Air pressure	: 0.45 - 0.5 MPa	
Water pressure	: 0.1 - 0.2 MPa	
Weight	Cuspidor Unit : 74 Kg Doctor Unit (Base Mount Type) : 40Kg Doctor Unit (Cart Type) : 23Kg Chair : 150 Kg	
Maximum Load	:135Kg	
Protection level against water	: IPX1 (IEC60529)	
Protection level electric shock	: Class I Type B	
Dental Light	: AL-720S / AL-520S / AL820S / 900 Dental Light (Type 920)	
Environmental Requirements	Ambient Temperature	Operating +10 °C - +40 °C Storage -20 °C - +70 °C
	Humidity	Operating 30 % - 75% Storage 10 % - 95%
	Atmospherical Pressure	Operating 700 hPa - 1060 hPa Storage 600 hPa - 1060 hPa

### **3. INSTALLATION INSTRUCTIONS**

#### **3-1. Pre-Installation Requirements**

##### **3-1-1. General requirements**

- 1) The contractor is to supply the necessary service and materials to complete the installation to the satisfaction of the dentists and the installation engineer.
- 2) This includes the supply and installation of the electric power supply cables with main isolating switch and fuses, air supply piping, water supply piping, suction piping including vacuum pump and its control wires and drain piping as noted on the installation diagrams.

##### **3-1-2. Setting requirements**

- 1) The SP CLEO II dental unit comprises of a Chair section, Cuspidor section, Doctor unit section and Light section.
- 2) The chair and unit should be sited taking into consideration the position of the drain pipe.
- 3) The place on which the unit is set must have an endurance force of  $400\text{kg/m}^2$ .
- 4) The setting position of the chair is shown in Fig.3-1 on Page 6 as recommended example.

##### **3-1-3. Piping and plumbing requirements**

- 1) All piping and conduits for cables are to be laid down under the floor and to come out from the floor.
- 2) The installation position and height from the floor of each pipe and cable conduit are shown in Fig.3-1.
- 3) The recommended sizes, materials and end piece are shown in Table-1.  
Air vacuum type does not require suction pipe, vacuum control wire and its conduit.
- 4) Regarding installation of the vacuum pump and its connection to the main suction line, follow the recommendations given by the manufacturer of the vacuum pump system.
- 5) All Piping should be arranged to avoid  $90^\circ$  bends where possible.

##### **3-1-4. Air supply requirements**

- 1) Compressed air to be supplied should be filtered.  
Dirty and moisture contaminated air may cause trouble in unit air system.
- 2) Air Pressure  
Regulate the outlet air pressure of the compressor to the utility section at  $0.54 - 0.59\text{ Mpa}$  ( $5.0-5.5\text{kg/cm}^2$ ) and the air pressure should be kept higher than  $0.49\text{ Mpa}$  ( $5\text{kg/cm}^2$ ) at any time.
- 3) Compressed Air Supply Capacity  
Compressed air supply capacity is at least  $55\text{ l/min}$ . (Central Vacuum type)  
Compressed air supply capacity is at least  $88\text{ l/min}$ . (Air vacuum type)

##### **3-1-5. Water supply requirements**

- 1) The supply water should be clean.  
Dirty water may cause trouble in unit water line.
- 2) Water Pressure  
More than  $0.1\text{ Mpa}$  ( $1\text{kg/cm}^2$ ) water pressure in utility section is required for operating unit efficiently at any time.

### 3-1-6. Electric supply requirements

1) The connection of power supply cable is to be carried out in accordance with the local electrical regulations.

2) Rating of supply voltage and power consumption

AC.115V 7.7 / 6.3A 50/60 Hz

AC.220V 3.5 / 3.5A 50/60 Hz

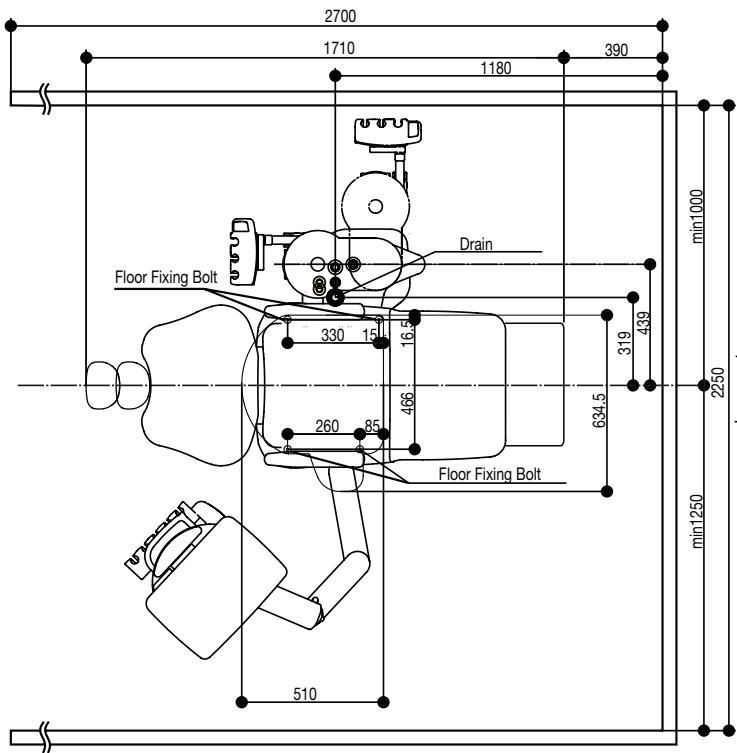
AC.230V 3.4 A 50 Hz

AC.240V 3.6 A 50 Hz

3) Power supply line should be provided with fuses or circuit breaker in accordance with power consumption.

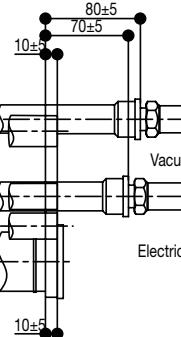
4) The earth wire (ground wire) should be provided in the utility section.

5) All cables should have at least 500mm surplus from the floor so that they are long enough to be connected with the terminals in the utility section.

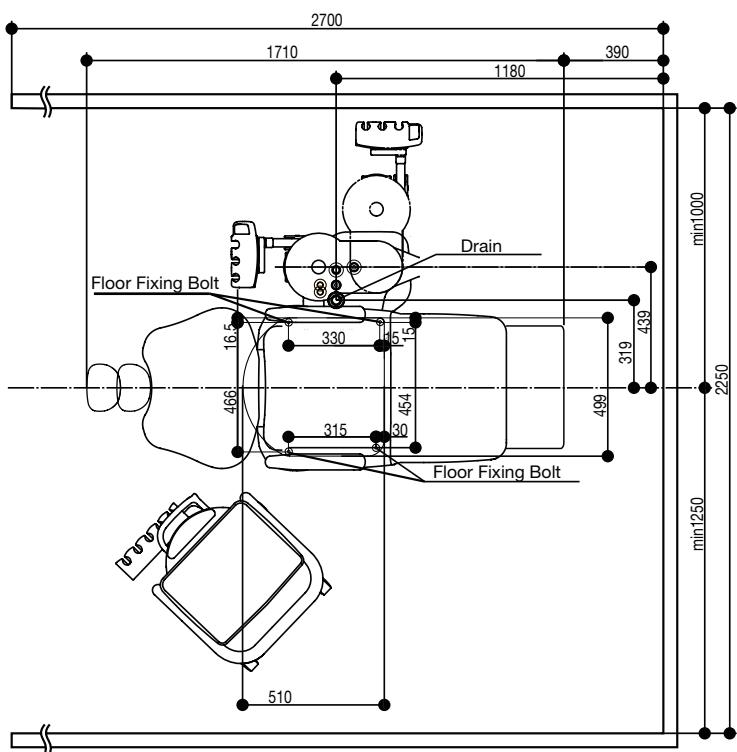
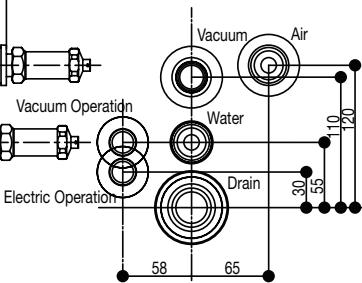


Detail of Piping (Side View)

$\pm 5\text{mm}$



Detail of Piping (Top View)



Item	Pipe	Size	Socket
Compressed air supply pipe	Shock resistance P.V.C. Pipe HI-13	O. D. : 18mm I. D. : 13mm	PT1/2
Water supply pipe	Shock resistance P.V.C. Pipe HI-13	O. D. : 18mm I. D. : 13mm	PT1/2
Suction pipe	P.V.C. Pipe VP-20	O. D. : 26mm I. D. : 20mm	
Drain pipe	P.V.C. Pipe	O. D. : 44mm I. D. : 40mm	
Power supply cable conduit	P.V.C. VE-16	I. D. : 16mm	
Vacuum control wire conduit	P.V.C. VE-16	I. D. : 16mm	

Table - 1 The Recommended sizes, materials and end piece of pipes

Note : The suction pipe and drain pipe should be laid under the floor with an inclination of 1/200 - 1/400.

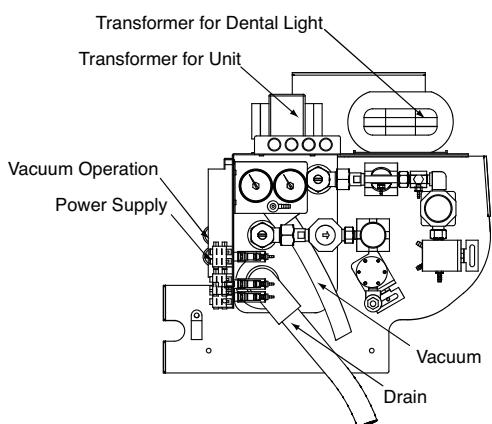


Fig.3-1 Setting position and plumbing layout

### 3-2. Unpacking

1. Checking the packages and unpacking.

The base mount type and the cart type are delivered into three packages.

( Chair section, Unit section and Dental Light )

2. Remove all the staples fixing carton to pallet, or cut the carton just above the stapled line, and remove the carton.

### 3-3. Installation of Chair Base

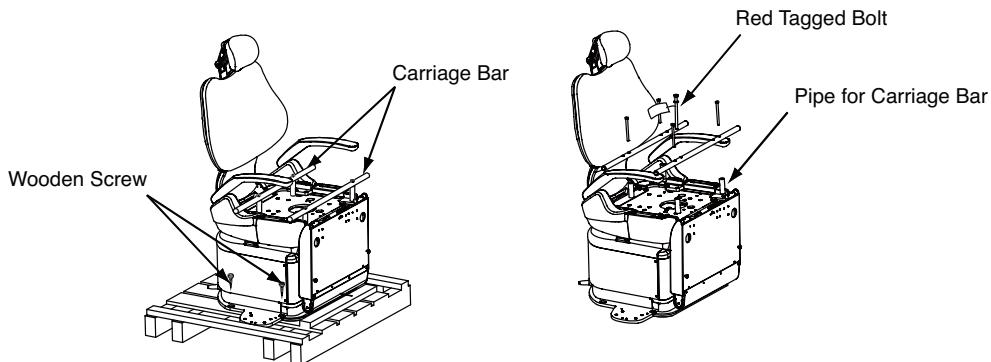
1. Remove four wood screws from the base plate.
2. Confirm that the red tagged bolt is tightened.

Remove the base section from the pallet by holding the carriage bars, place the chair in the planned location. Do not hold the plastic parts.

#### **⚠ CAUTION**

**Do not plug the power supply line before removing Red tagged fixing bolt.**

3. Remove two carriage bars from the chair base.
4. Remove red tagged bolt from the chair base.

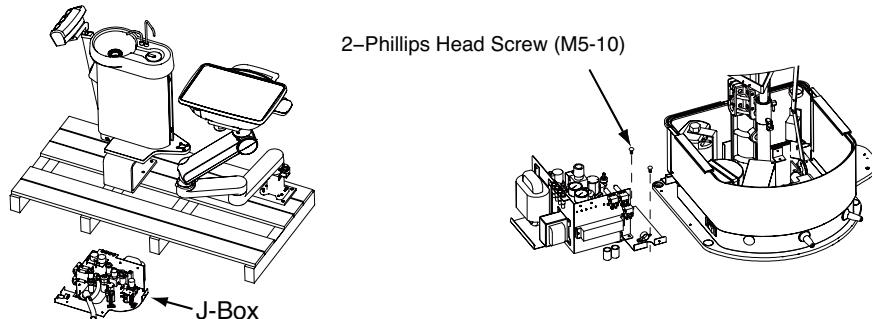


### 3-4. Installation of J-box Assembly

1. Remove the j-box assembly from the pallet.
2. Place the j-box to the planned location. Attach the j-box to the chair with two phillips head screws (M5-10).

#### **⚠ CAUTION**

**Do not damage the piping and wirings by the chair base.**



### 3-5. Installation of Stop Valve and Power Supply Line

1. Install the stop valves for water and air to each supply pipe.  
The directions of stop valves are shown in fig.3-5.
- Note : Stop valves are packed in the unit section carton.
2. After installation of the stop valves, open the valves  
and flush out dust and chips in the piping.
3. Connect the power supply line wires to the electric terminal block  
N,L and Earth.
4. Temporary connect the chair power supply cable to the mains  
via a safe block, then raise the chair upper structure to install  
the unit section.
4. After installing the unit, connect the chair power supply cable to  
the terminal block (terminals 4, 7 & earth)

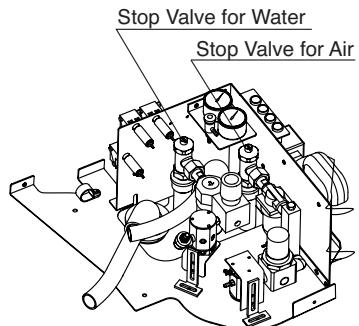
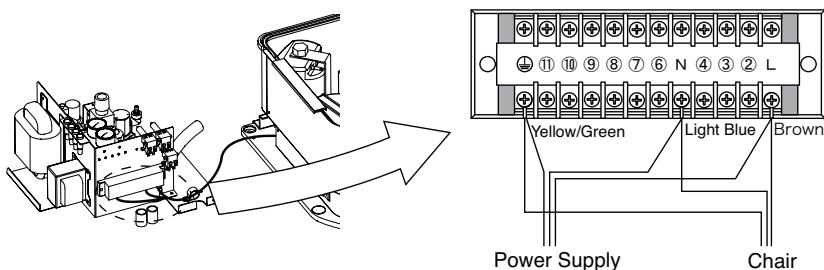
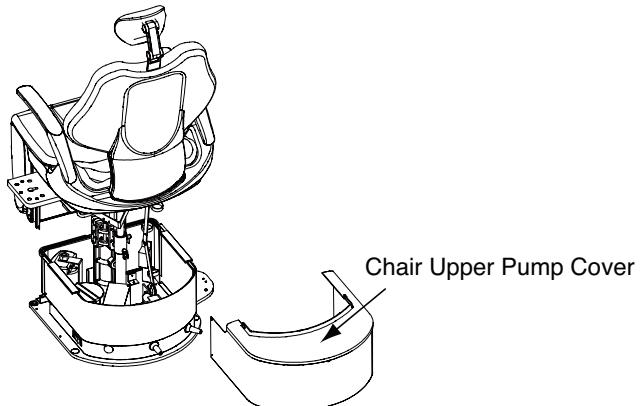


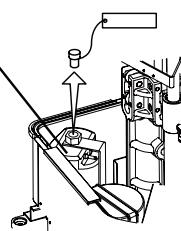
Fig.3-5 Direction of Stop Valve



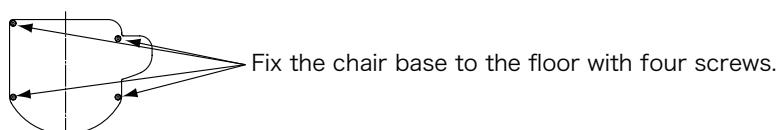
5. Remove the upper and middle pump covers and the front of the bottom cover.



6. Remove the red tagged oil plug from the oil reservoir.



7. Fix the chair base to the floor with 4 screws(Supplied coach bolt).

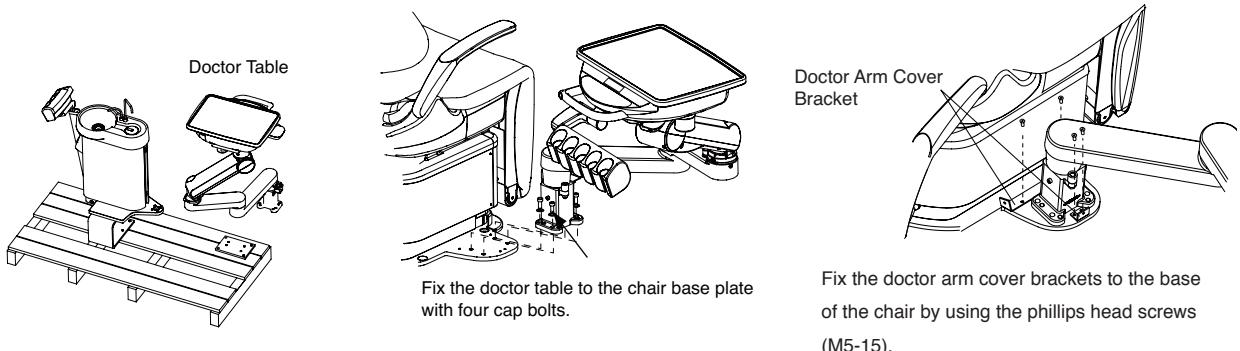


#### **CAUTION**

Chair must be fixed to the floor with screws to prevent from tipping over.

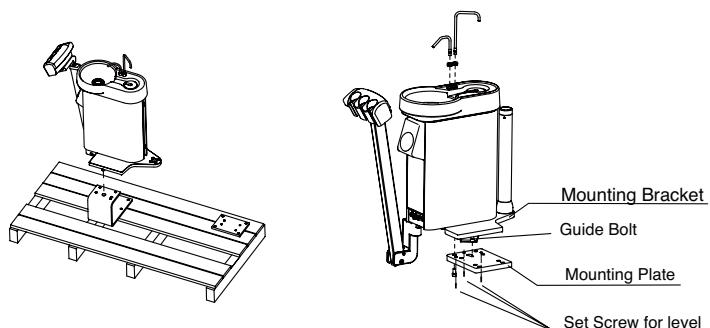
### 3-6. Installation of Doctor Table

1. Remove the doctor table from the pallet.
2. Fix the doctor table to the chair base plate with four cap bolts (M10).
3. Fix the doctor arm cover brackets to the base of the chair



### 3-7. Installation of Cuspidor Unit

1. Remove the cuspidor unit from the pallet.
2. Catch the guide bolt of cuspidor unit on the mounting plate.
3. Fix the cuspidor unit to the mounting plate with four cap bolts (M10-30).
4. Adjust the level with three set screws.



5. Pass the tubings and cables through the hose guide brackets A and bracket B to the j-box.

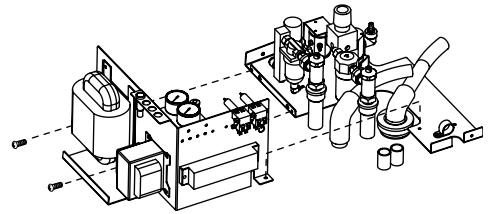
Note : Align the green tape on the tubings and cables with the bracket A.

Adjust the position of the tubings and cables to allow free movement  
and prevent scrapping inside the base covers.



### 3-8. Installation of Utility Section

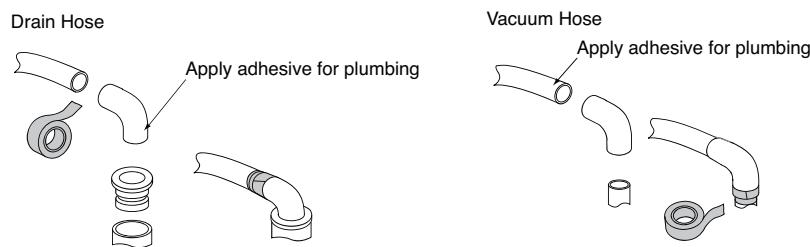
1. Remove the transformer part from the j-box assembly.



2. Drain hose and vacuum hose

- 1) Cut the drain hose and vacuum hose from cuspidor unit at suitable length and connect them to each elbow with plastic glue.
- 2) Insert the drain hose elbow and vacuum hose elbow into each pipe.

**Note :** Drain pipe should be sealed with silicone sealant or taping.

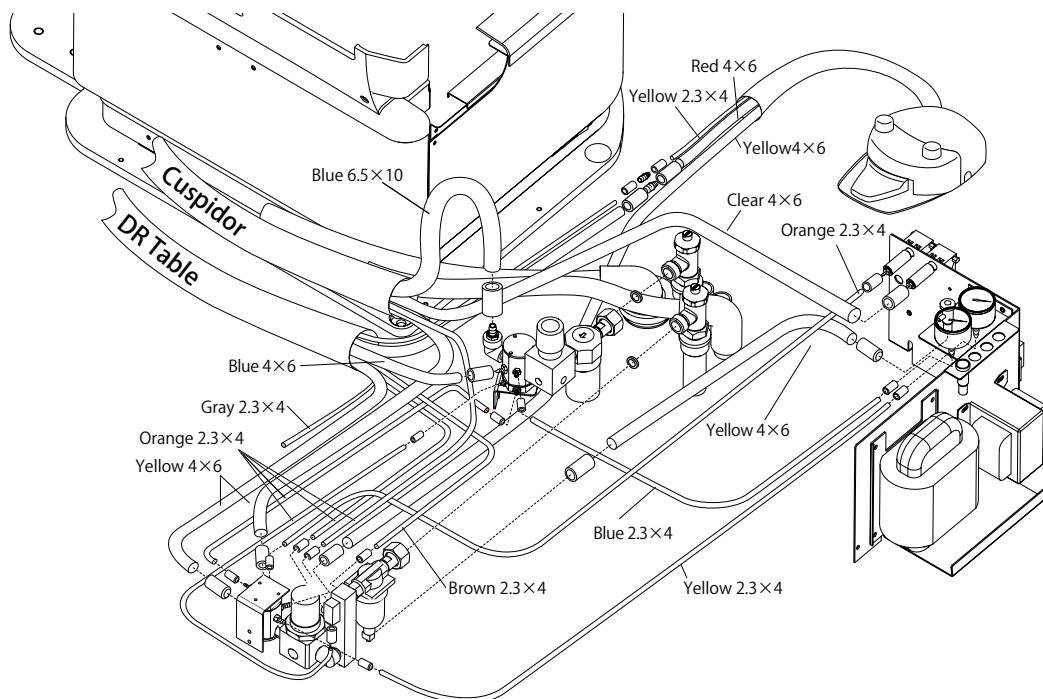


3. Water and air supply lines connection.

- 1) Connect the water supply line to the water stop valve with packing.
- 2) Connect the air supply line to the air stop valve with packing.

4. Tubings connection.

- 1) Connect the tubings from the doctor table and cuspidor unit to utility parts.
- 2) Connect the tubings from the foot control to utility parts.

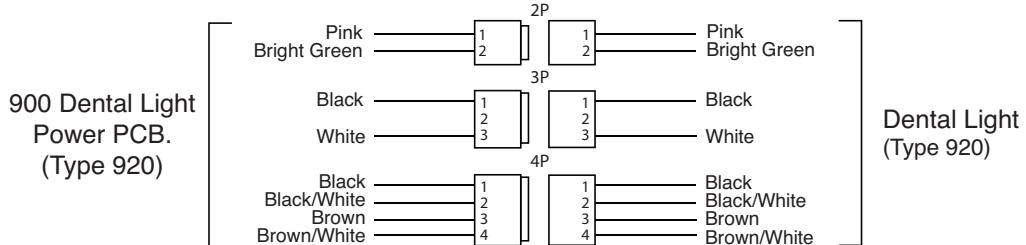
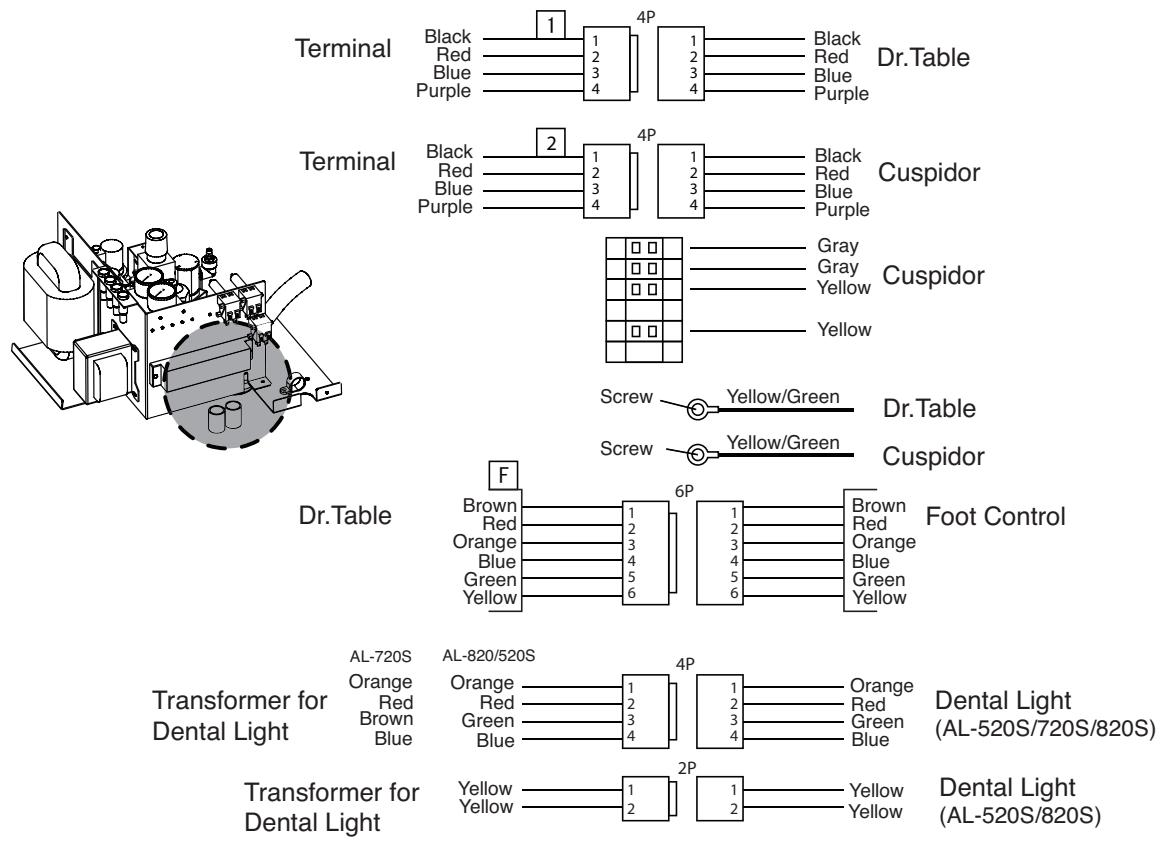


5. Attach the transformer part to the j-box assembly.

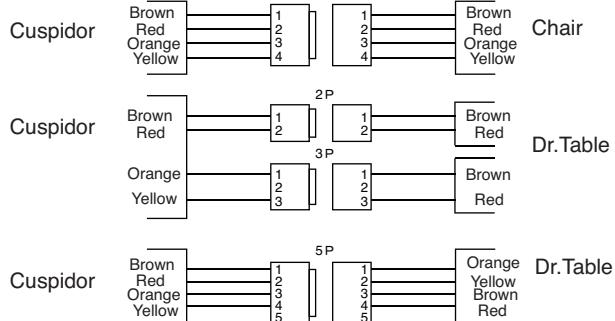
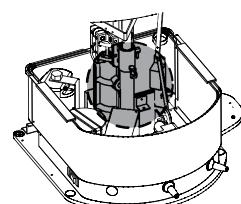
## 6. Electric wires connection.

1) Connect electric wire connectors from chair to electric terminal.

Junction Box Section

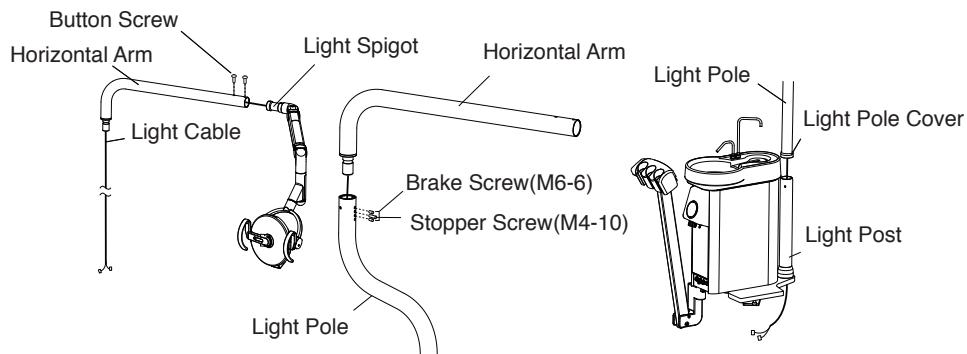


Chair Section



### 3-9. Installation of Dental Light Section

1. Pass the light cable through the horizontal arm and insert the light spigot into the horizontal arm and fix it with two button screws (M6-8).
2. Set the rubber cover to light pole and fix the pole to light post with two hex socket set screws.
3. Pass the light cable through light pole to light post bottom.
4. Set brake screws and stopper screw.



5. Insert light cable pins into each connector in the cuspidor unit.

Wire colours and connectors for connection are shown in Fig.3-9-1, Fig.3-9-2, Fig.3-9-3.

Note : Connectors are packed in the dental light carton box.

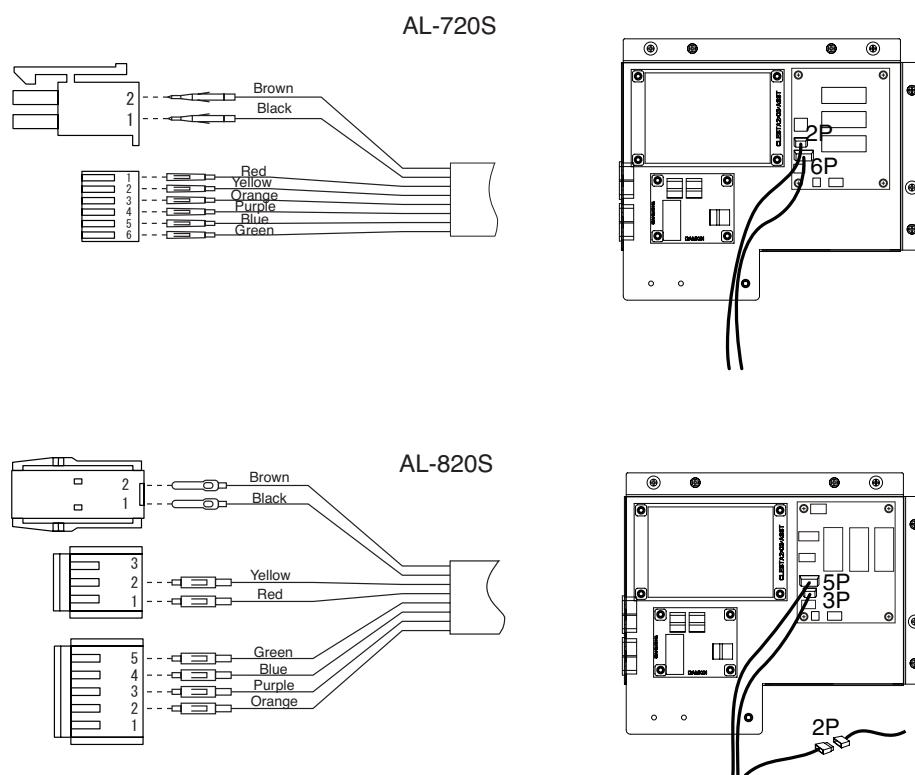


Fig.3-9-1

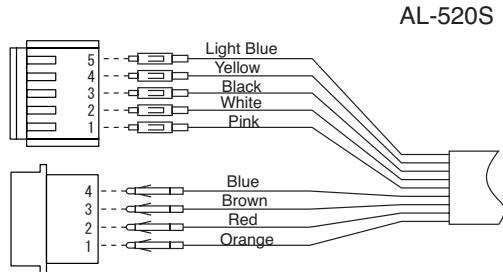
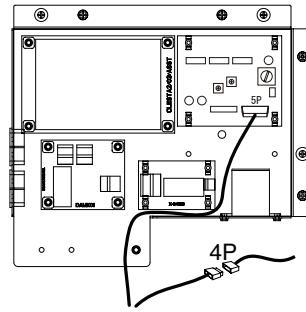


Fig.3-9-2



#### 6. Switching distance adjustment for dental light IO5000

- Dental light PCB. is located in the cuspidor unit.

The switching distance can be adjusted by the potentiometer on the PCB.

- Turning the potentiometer counter clockwise decreases the switching distance.

(Switching point becomes closer to the sensor)

- Turning clockwise increases switching distance.

(Switching point becomes farther from the sensor.)

- The recommended switching distance is about 70mm.

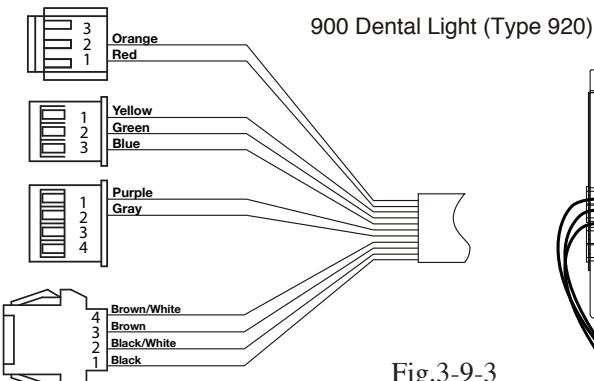
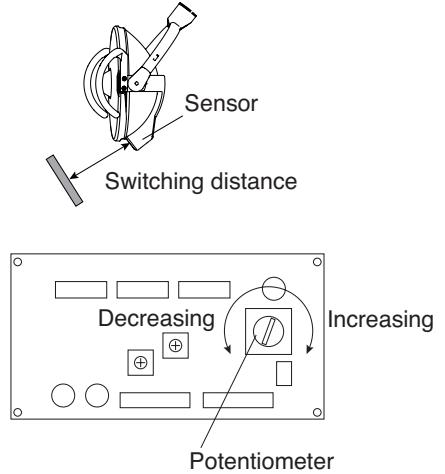
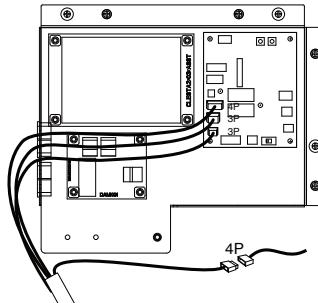
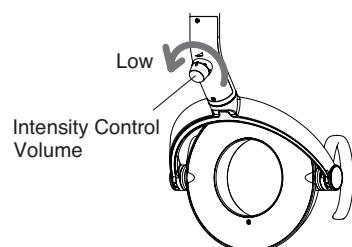


Fig.3-9-3

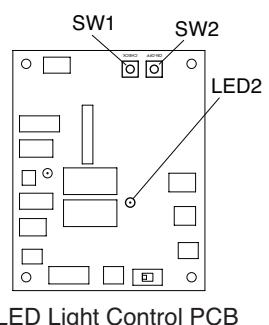


#### 7. Set the lower volume limit (Type 920 only)

Set the lower volume limit for 920 dental light after all installation is completed. LED light control PCB is located in the cuspidor unit.



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



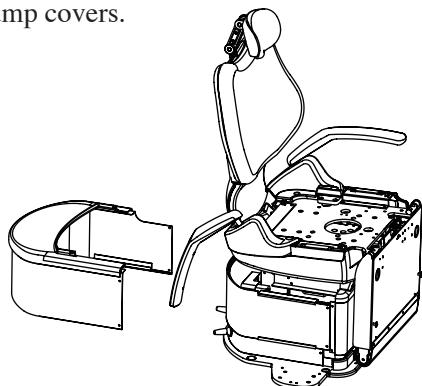
LED Light Control PCB

### **3-10. Installation of Chair Covers**

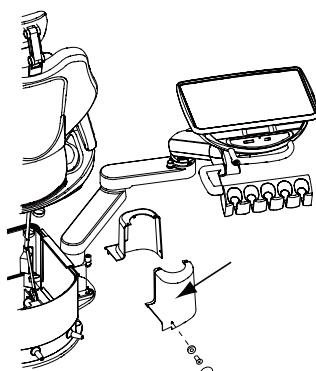
Note : Test the unit thoroughly, check for leaks and ensure that all chair and unit functions are working.

#### 1. Installation of covers.

- 1) Refit the chair pump covers.

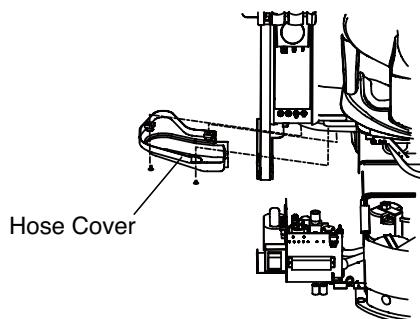


- 2) Attach the doctor table bracket covers by using the csk screws, i.e. 2 x M4-10 and 4 x M5-15, with the white cups and covers.



Attach the table bracket covers  
to the chair base.

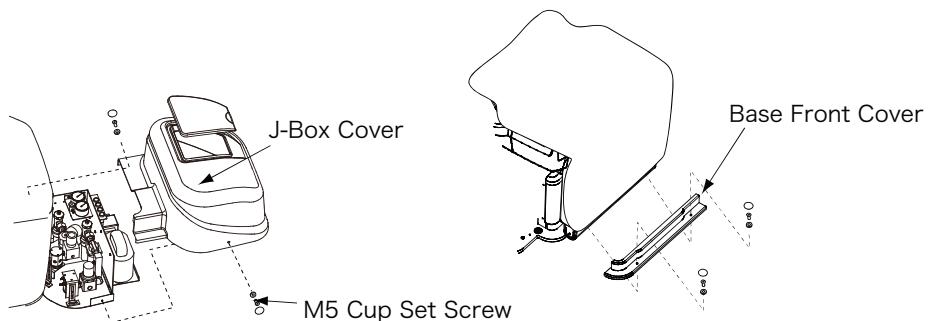
- 3) Fix the cuspidor hose cover by using the dome headrest screws,  
i.e. 2 x M5-18 and 1 x M5-10.



4) Fit the j-box cover by using the csk screws(M4-10) with the white cups and caps.

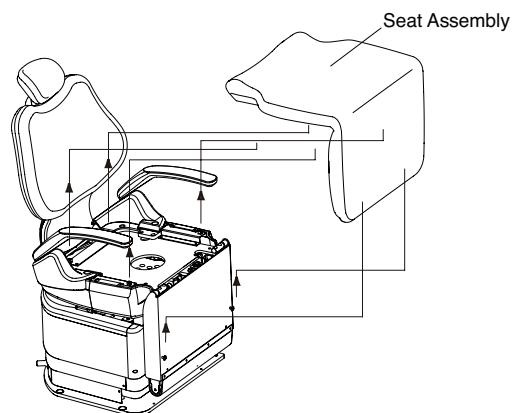
Attach the base front cover to the base plate by using the csk screws(M5-10) with the white cups and caps.

Note : Ensure not to pinch the tubings with the j-box cover.



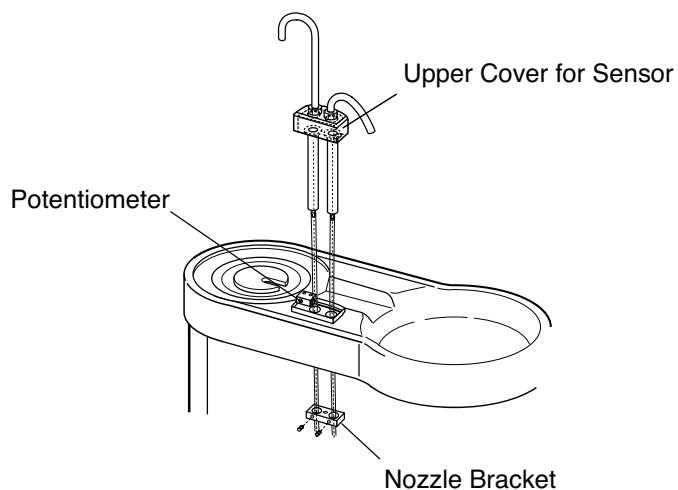
5) Fix the seat assembly.

Locate the seat assembly on to the location lugs of the legrest and push down on the seat until it snaps into the fixings.

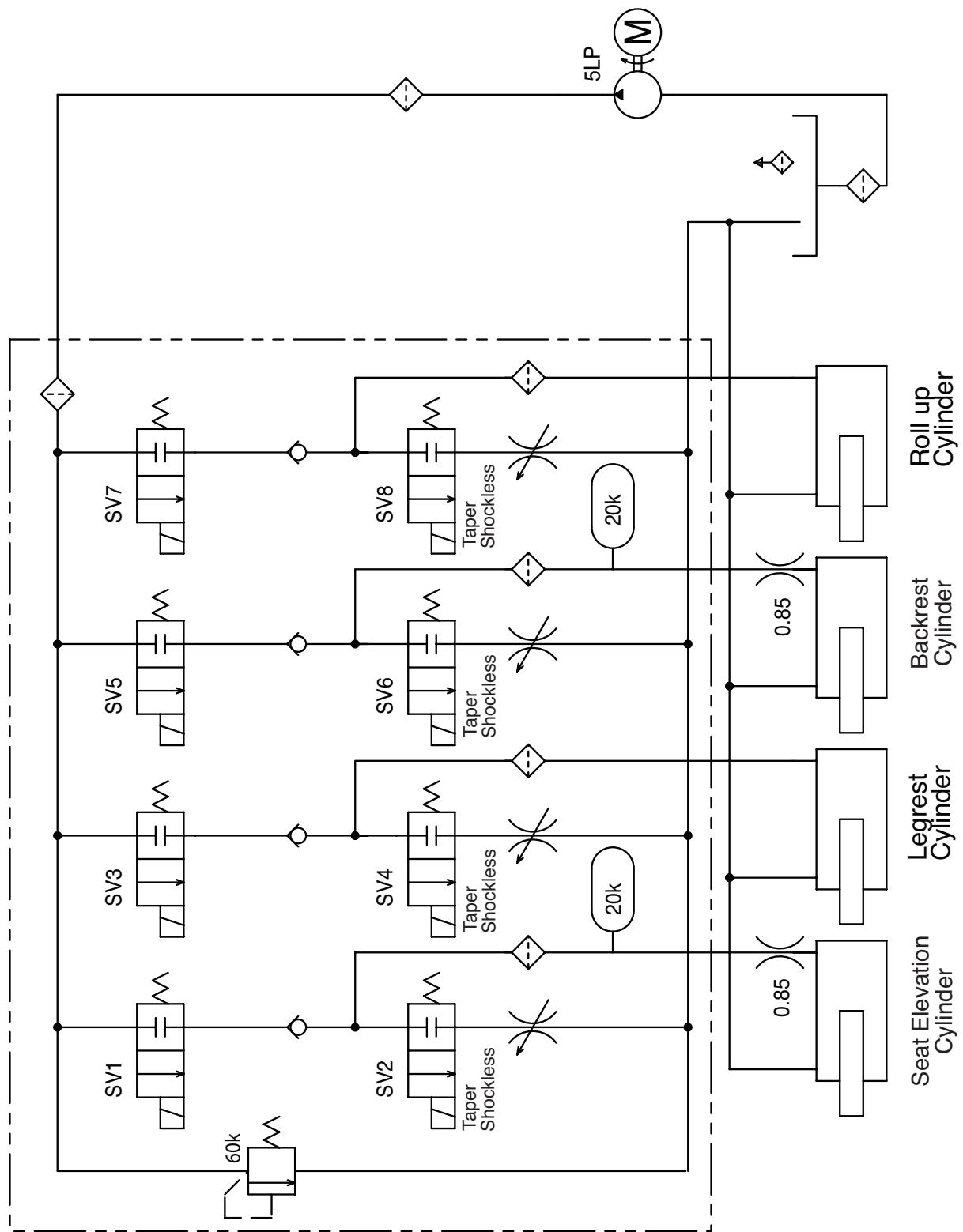


#### **4. SENSOR CUPFILLER (Option)**

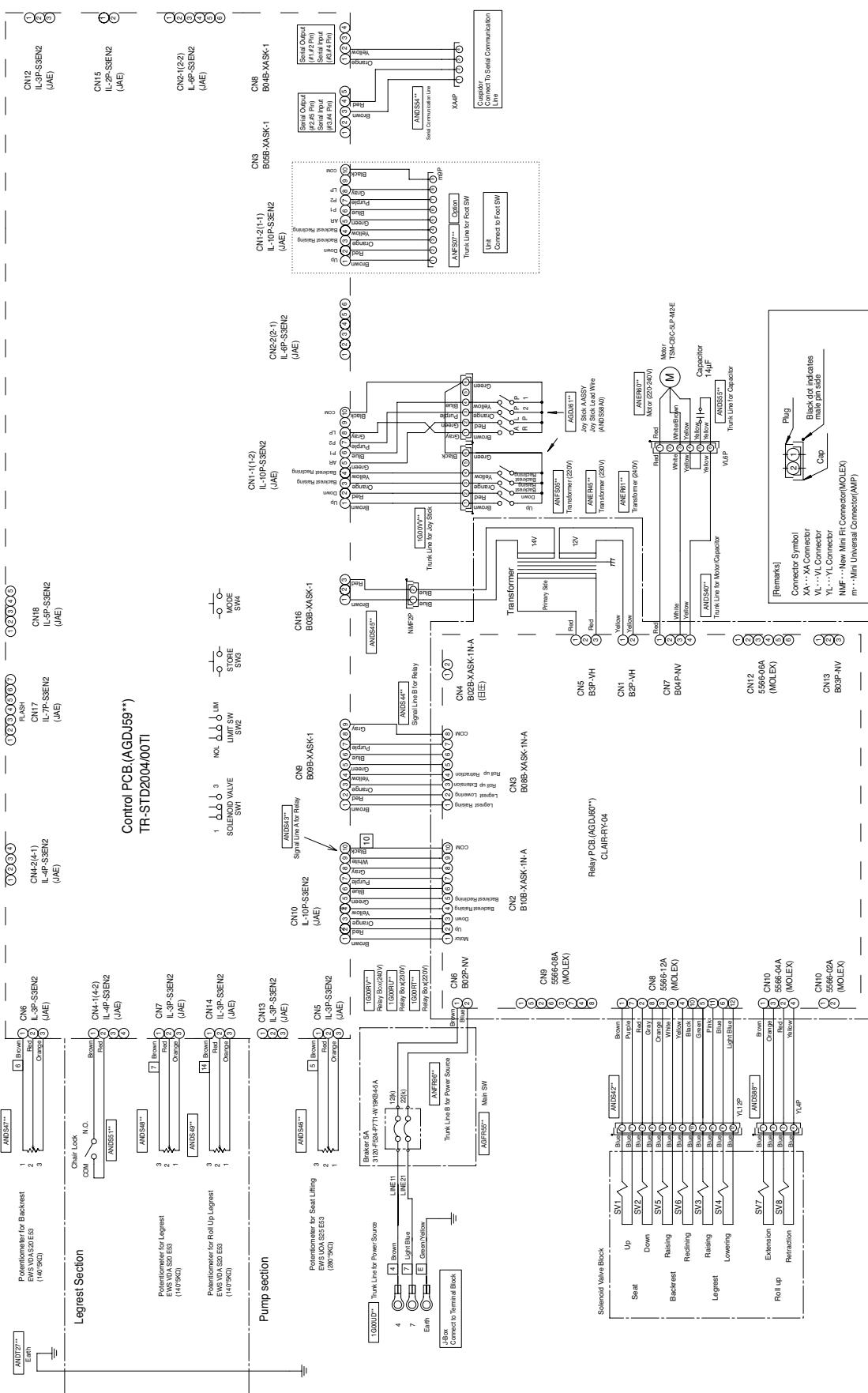
1. Sensor cupfiller Adjustment for Water level.
  - 1) Unscrew the set screw of nozzle bracket and remove the sensor upper cover.
  
2. Sensor cupfiller adjustment for switching distance.
  - 1) Turning the potentiometer clockwise decreases the switching distance.  
(Switching point becomes closer to the sensor)
  - 2) Turning counter clockwise increases switching distance.  
(Switching point becomes farther from the sensor.)



## 5. HYDRAULIC DIAGRAM FOR CHAIR

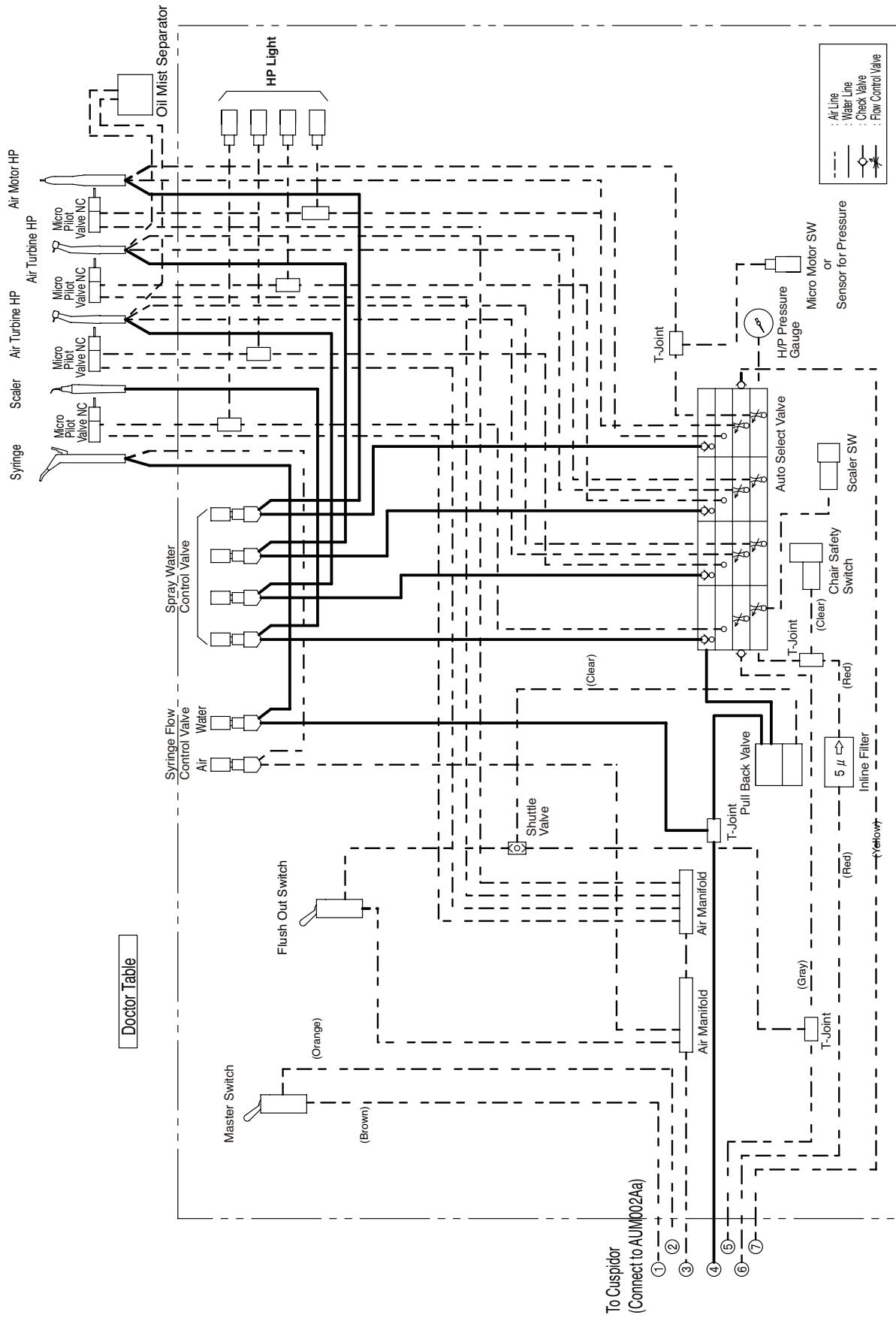


## 6. ELECTRICAL DIAGRAM FOR CHAIR

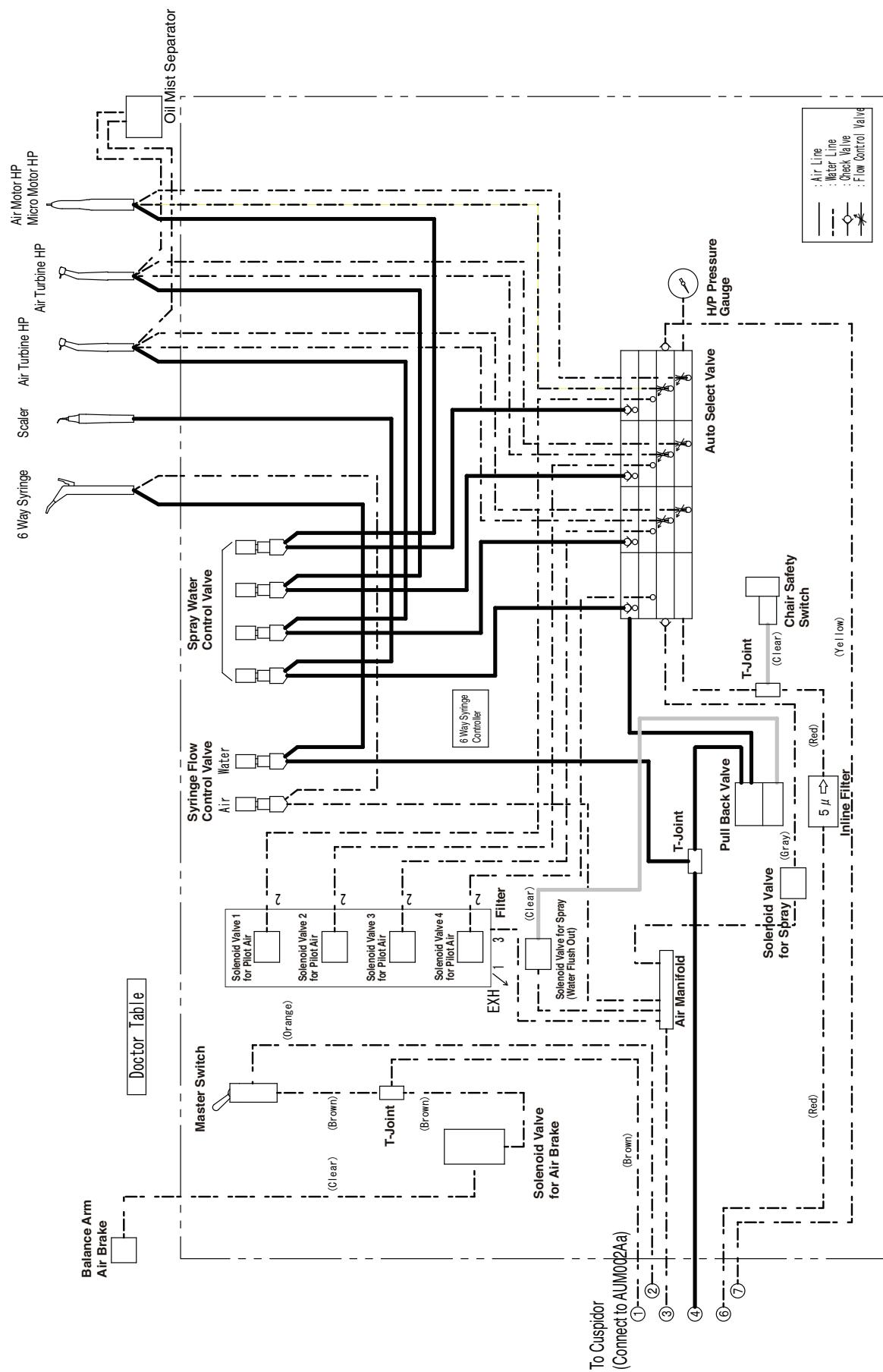


## 7. FLOW DIAGRAM FOR UNIT

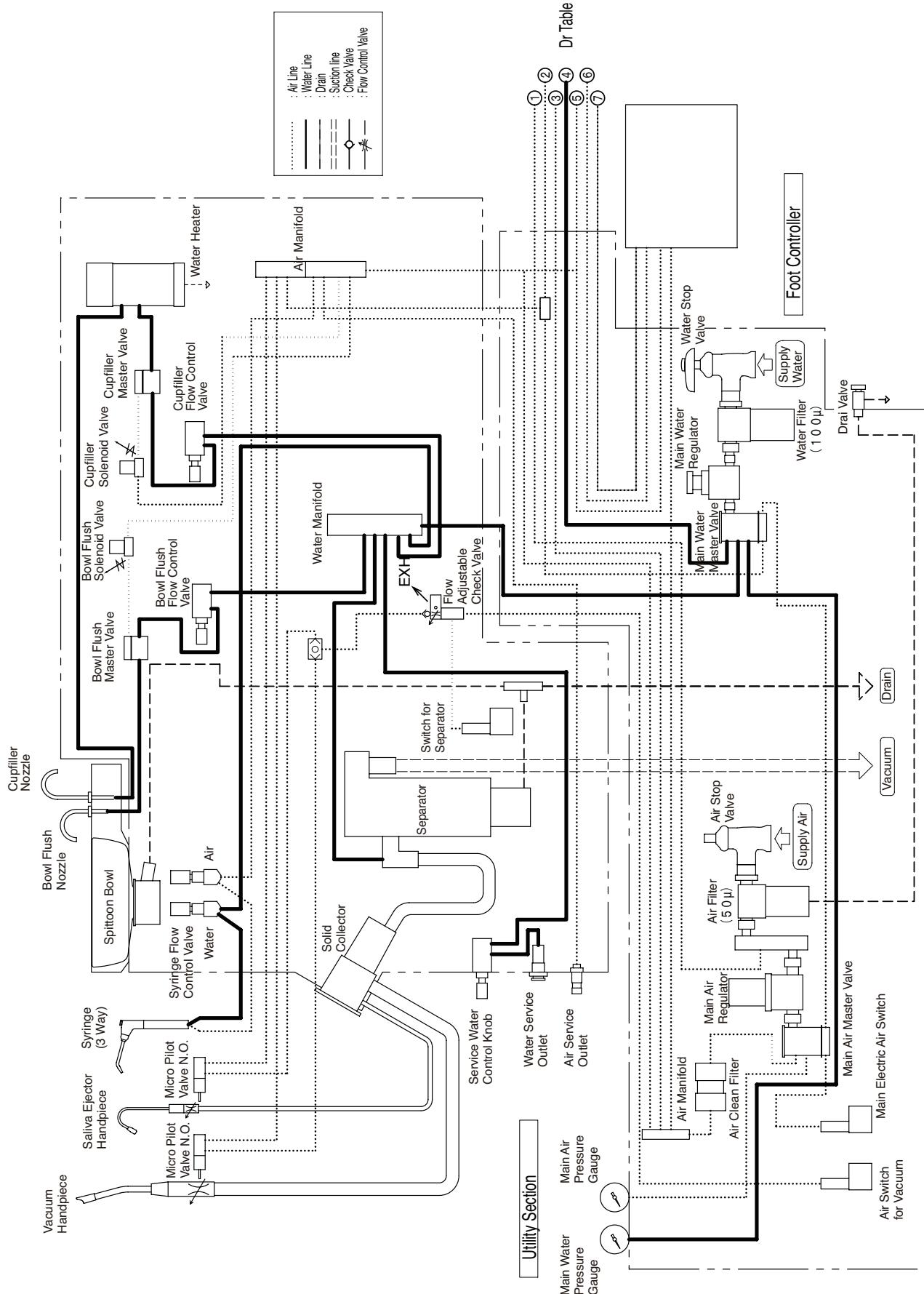
### 7-1. A Spec.



## 7-2. E Spec.

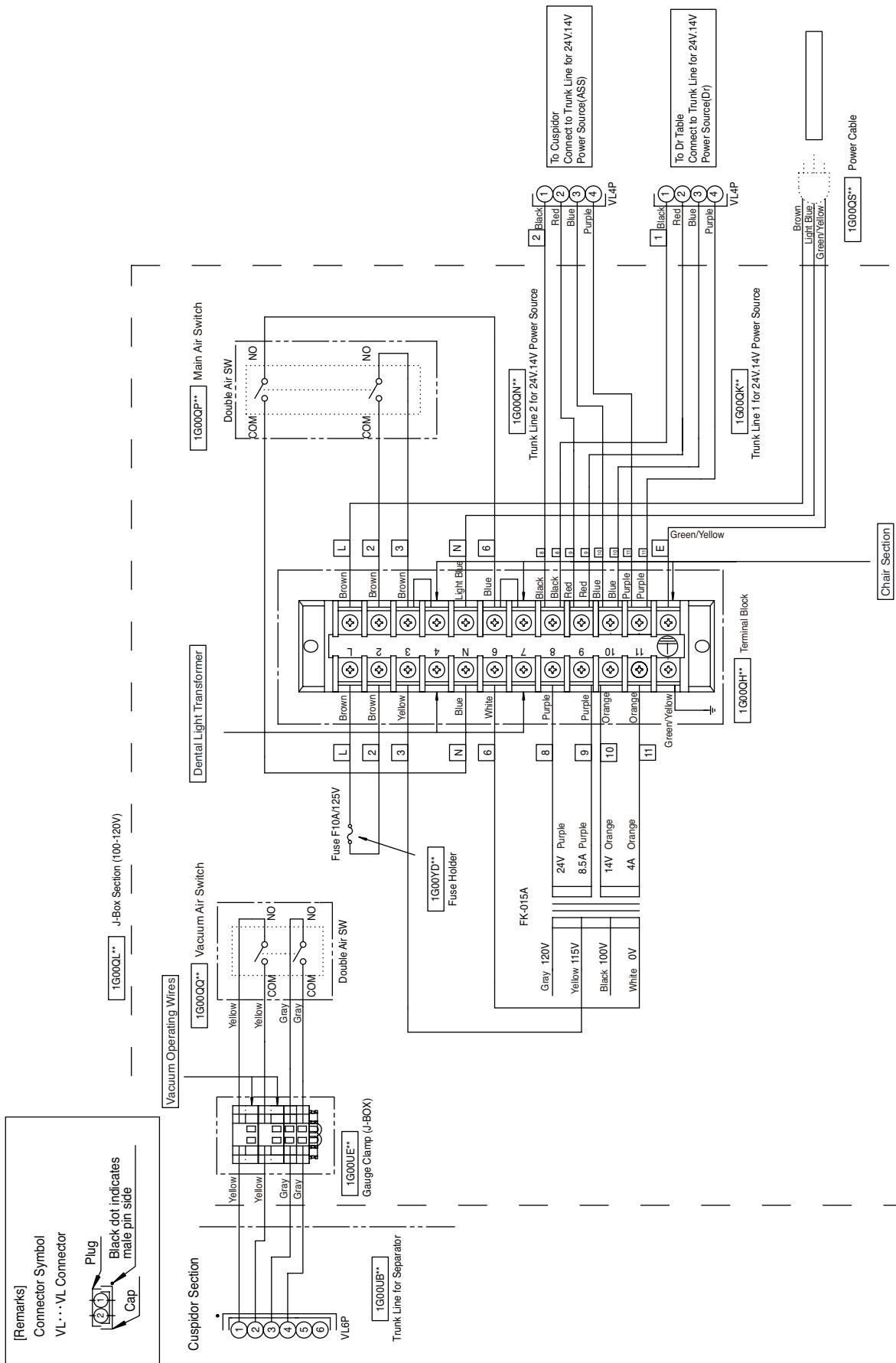


### 7-3. Cuspidor

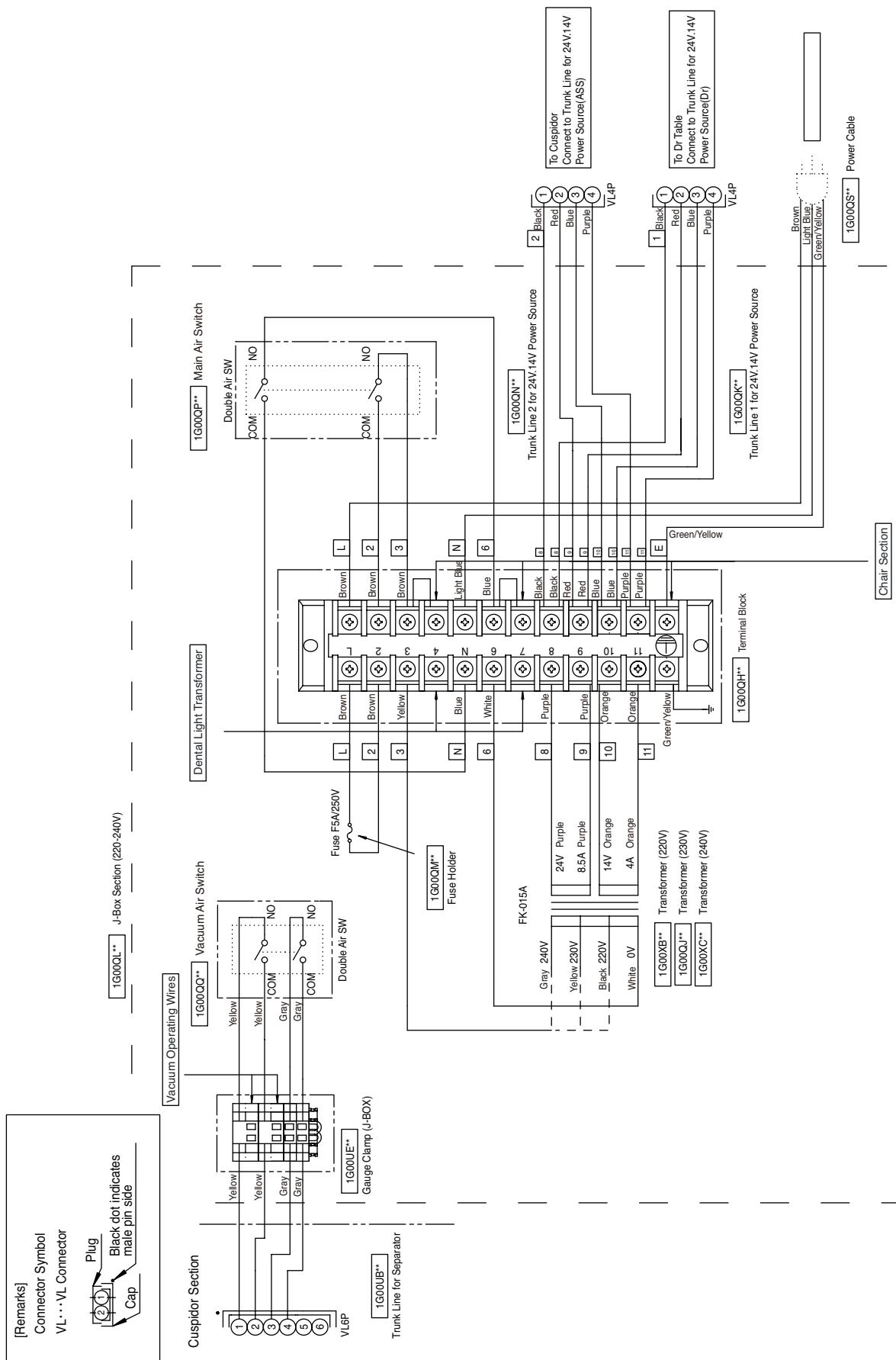


## 8. ELECTRIC DIAGRAM FOR UNIT

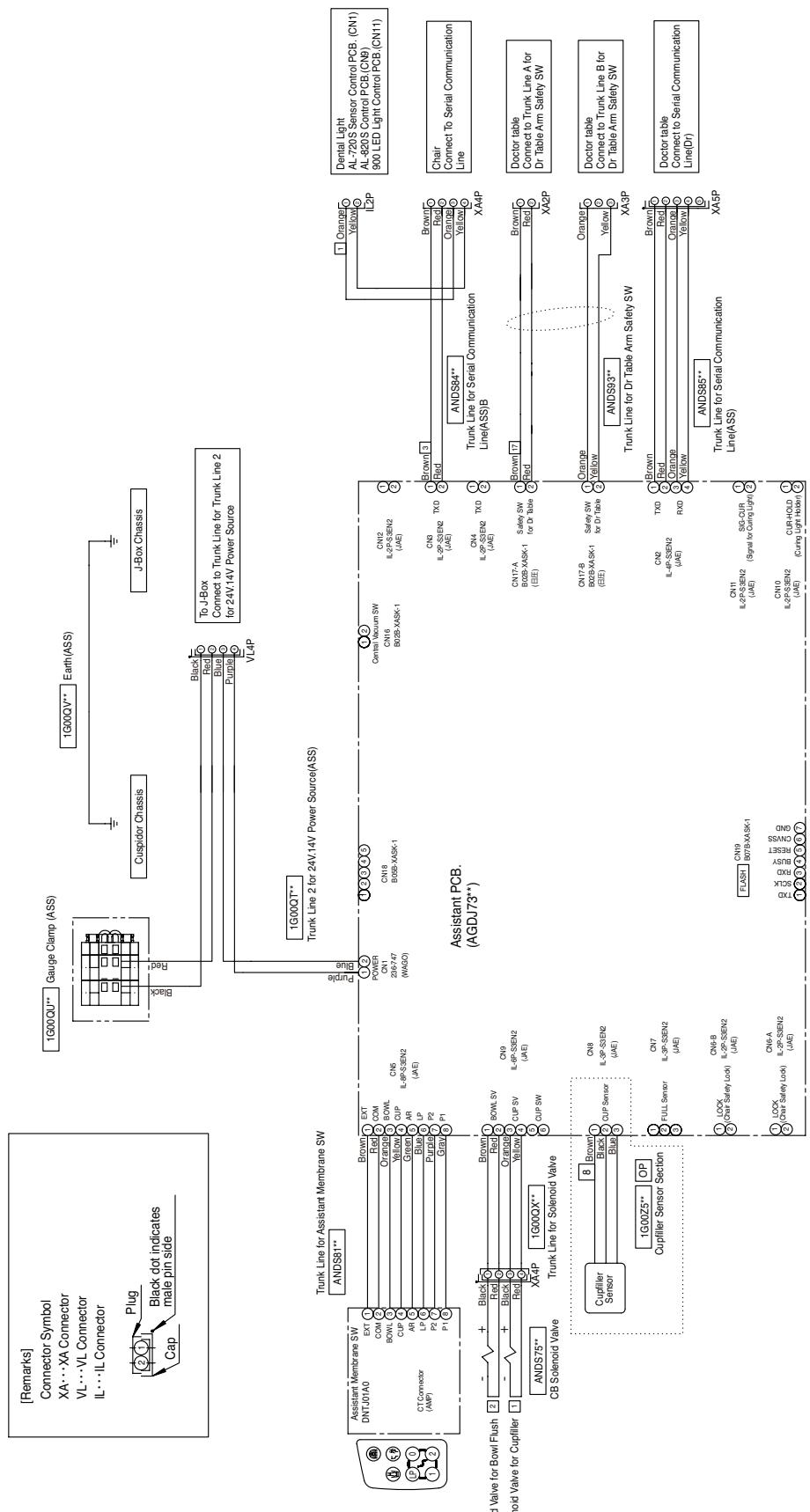
### 8-1. J-BOX(115V)



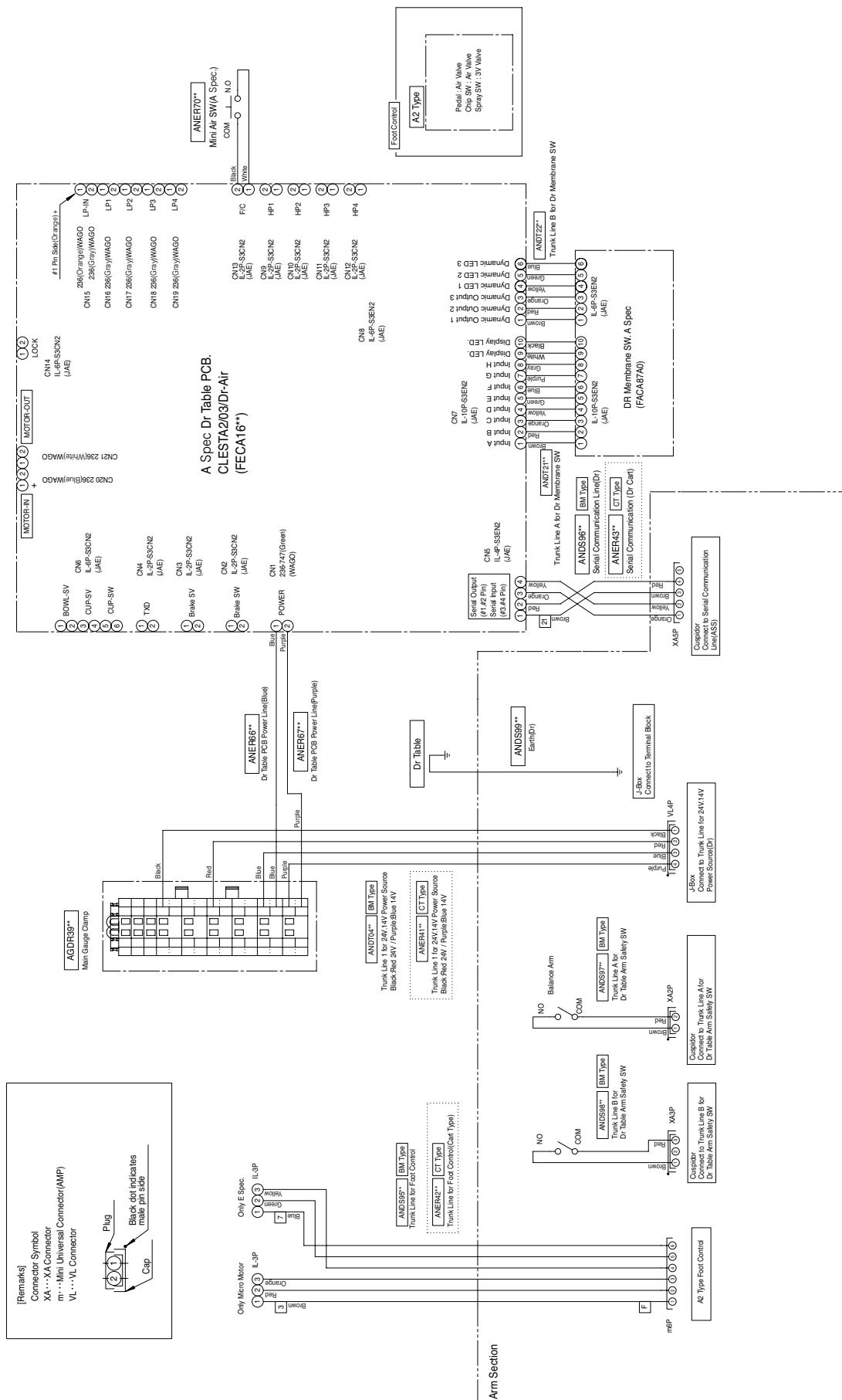
## 8-2. J-BOX (220V, 230V, 240V)



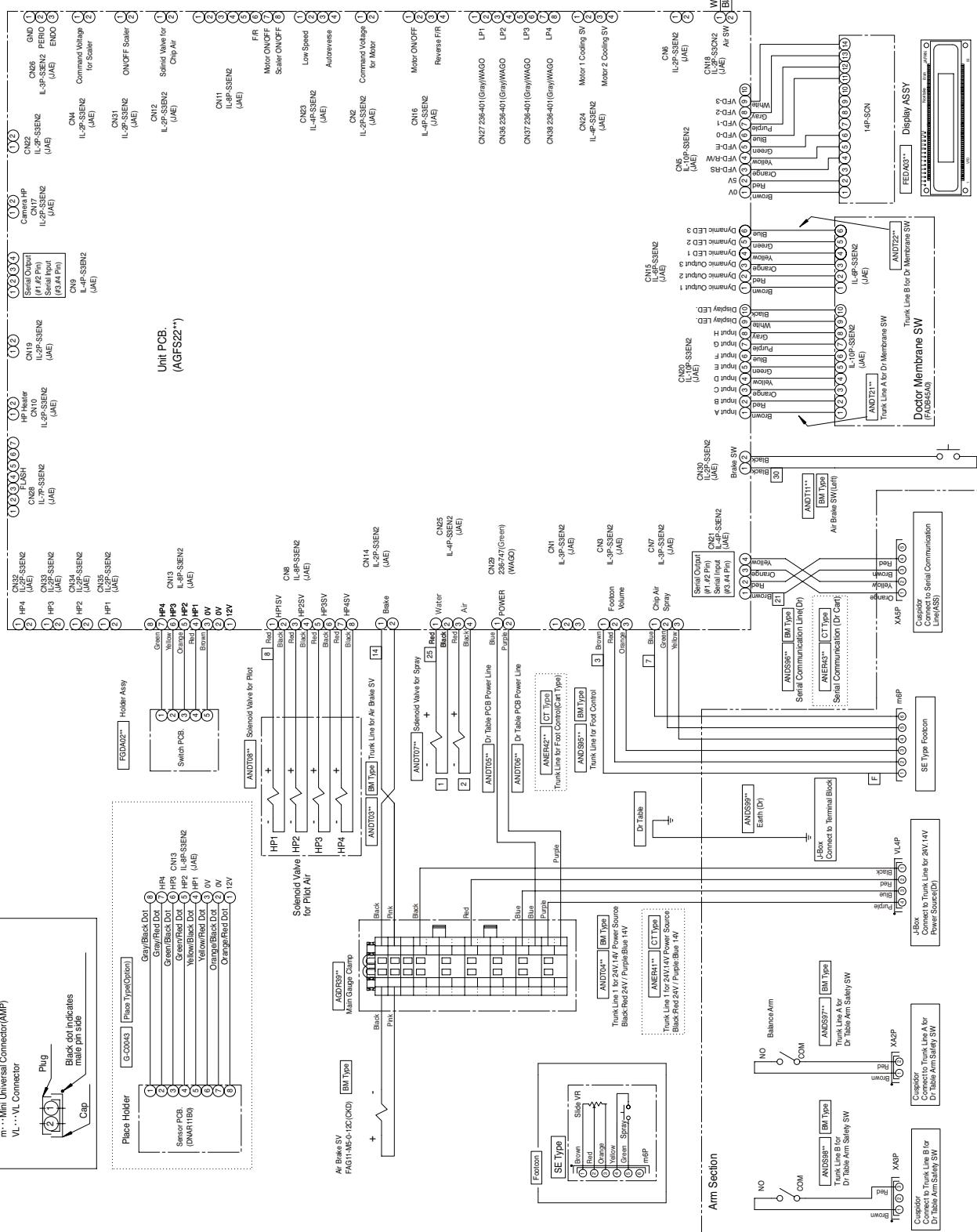
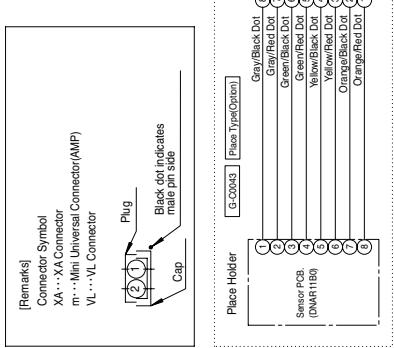
### 8-3. CUSPIDOR



## 8-4. DR TABLE UNIT (A SPEC.)

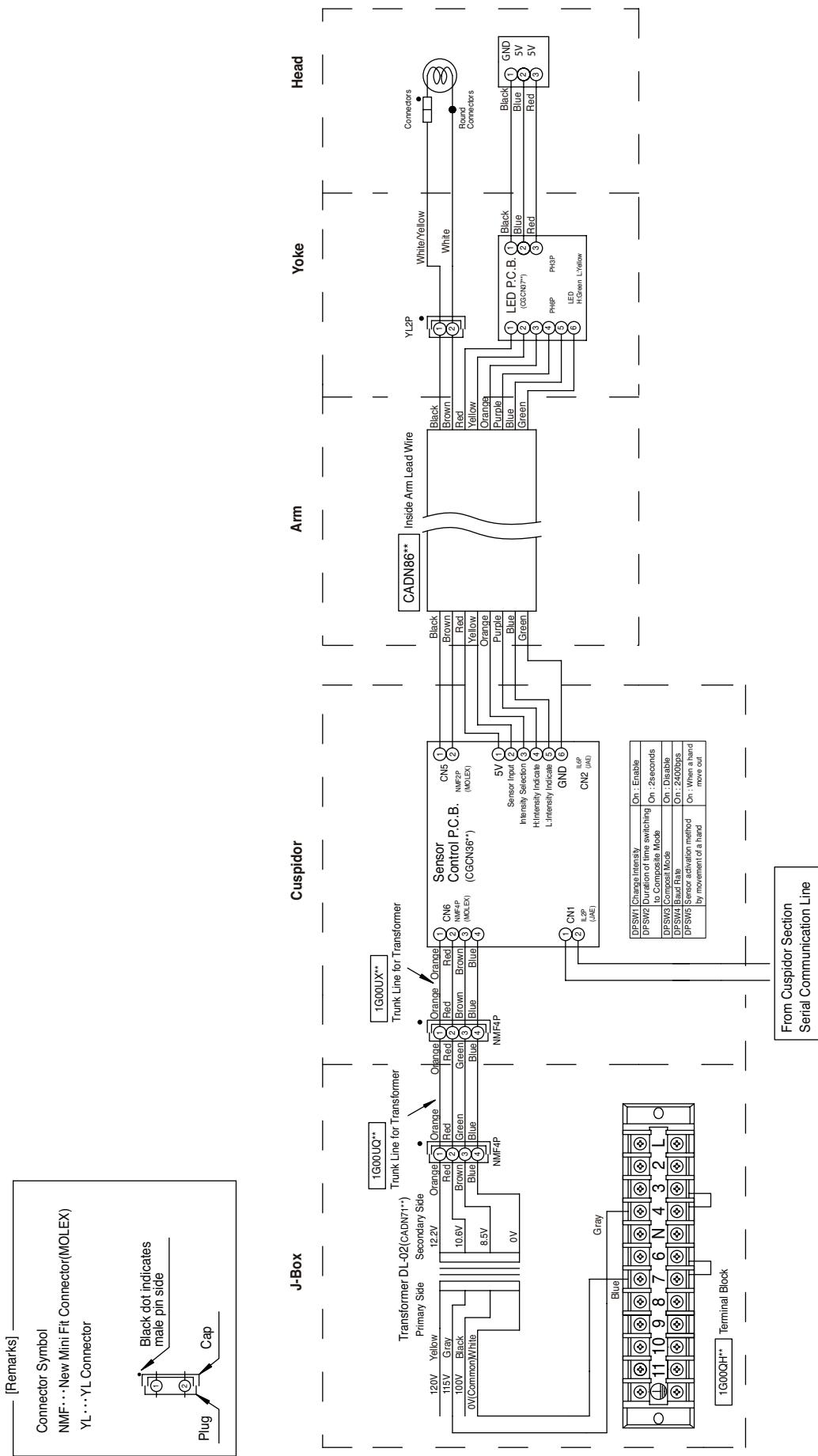


## 8-5. DR TABLE UNIT (E SPEC.)

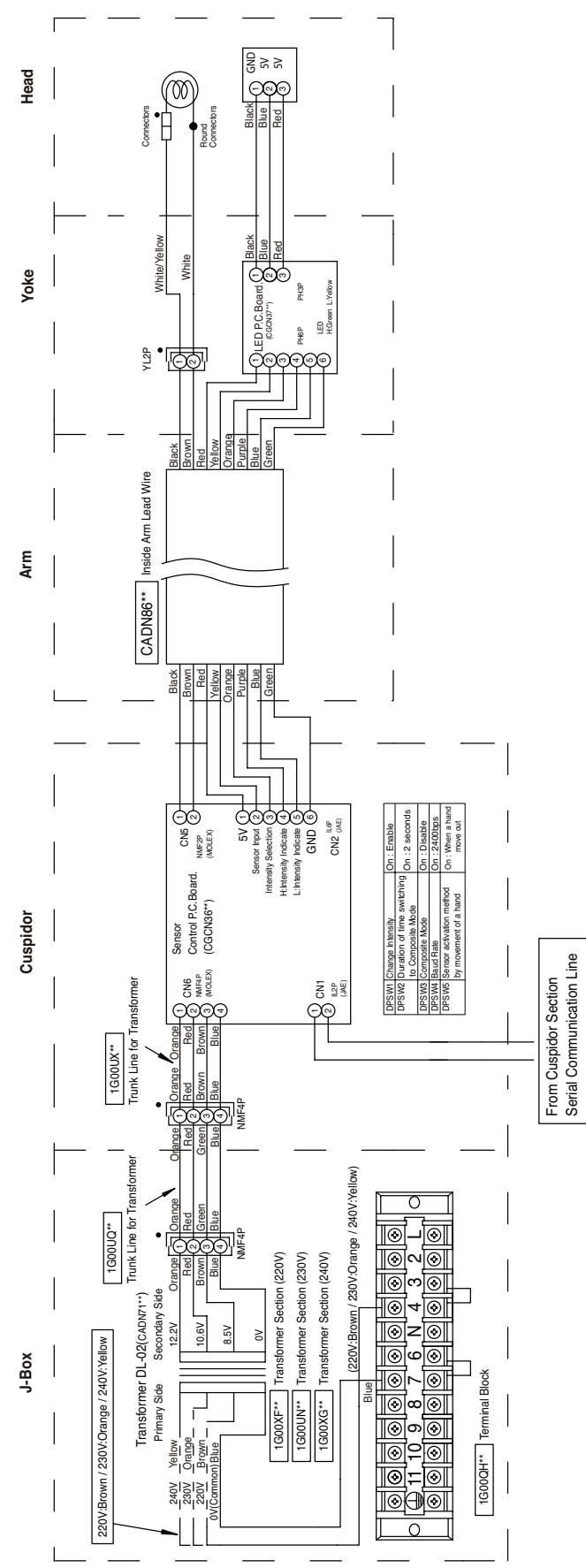
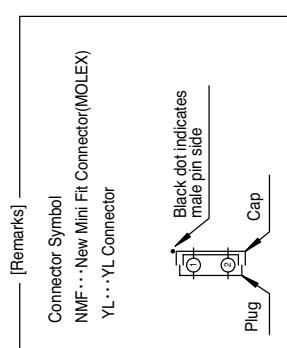


## 9. ELECTRIC DIAGRAM FOR Dental Light

### 9-1. Dental Light AL-720S (115V)



## 9-2. Dental Light AL-720S (220V, 230V, 240V)

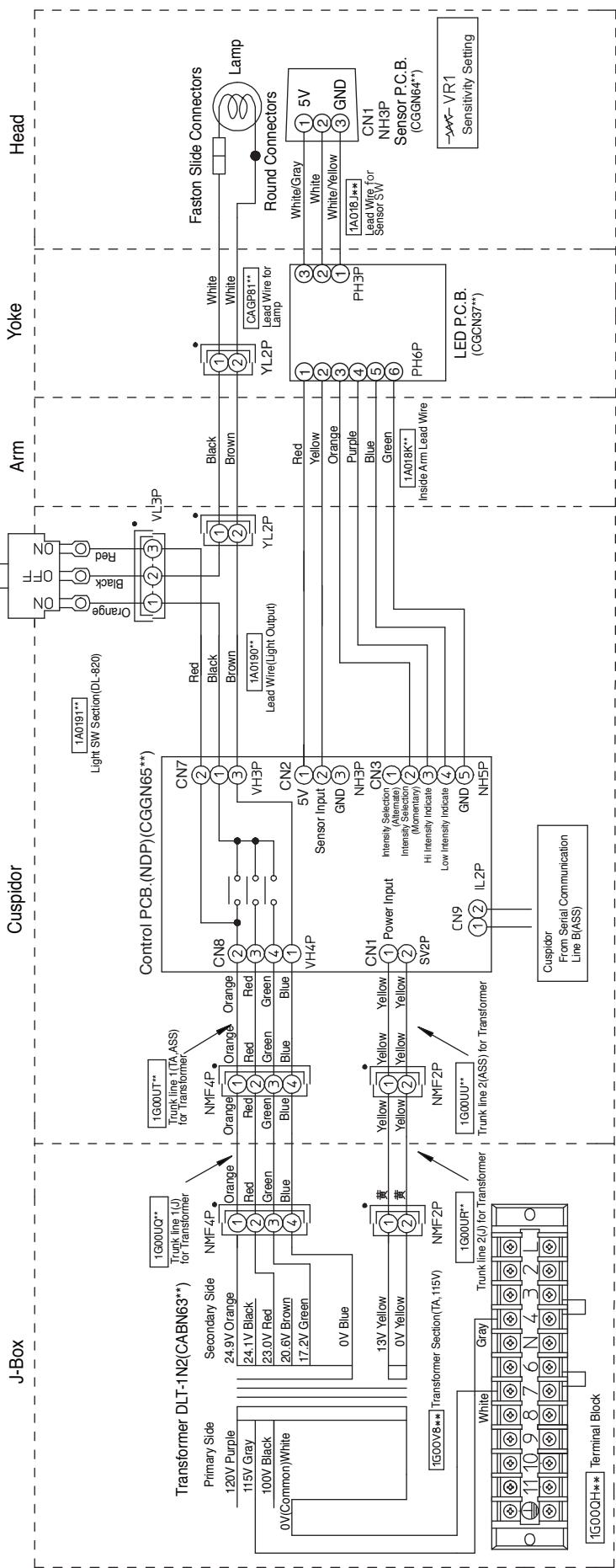


### 9-3. Dental Light AL-820S (115V)

Remark	Connector Symbol	Black dot
	NMF... New Mini Fit Connector	
	VL... VL Connector	Black dot indicates male pin side
	YL... YL Connector	
	SV... SV Connector	
	VH... VH Connector	
	PH... PH Connector	
	NH... NH Connector	

Mode Selection Switch  
OFF

Black dot indicates male pin side  
Cap

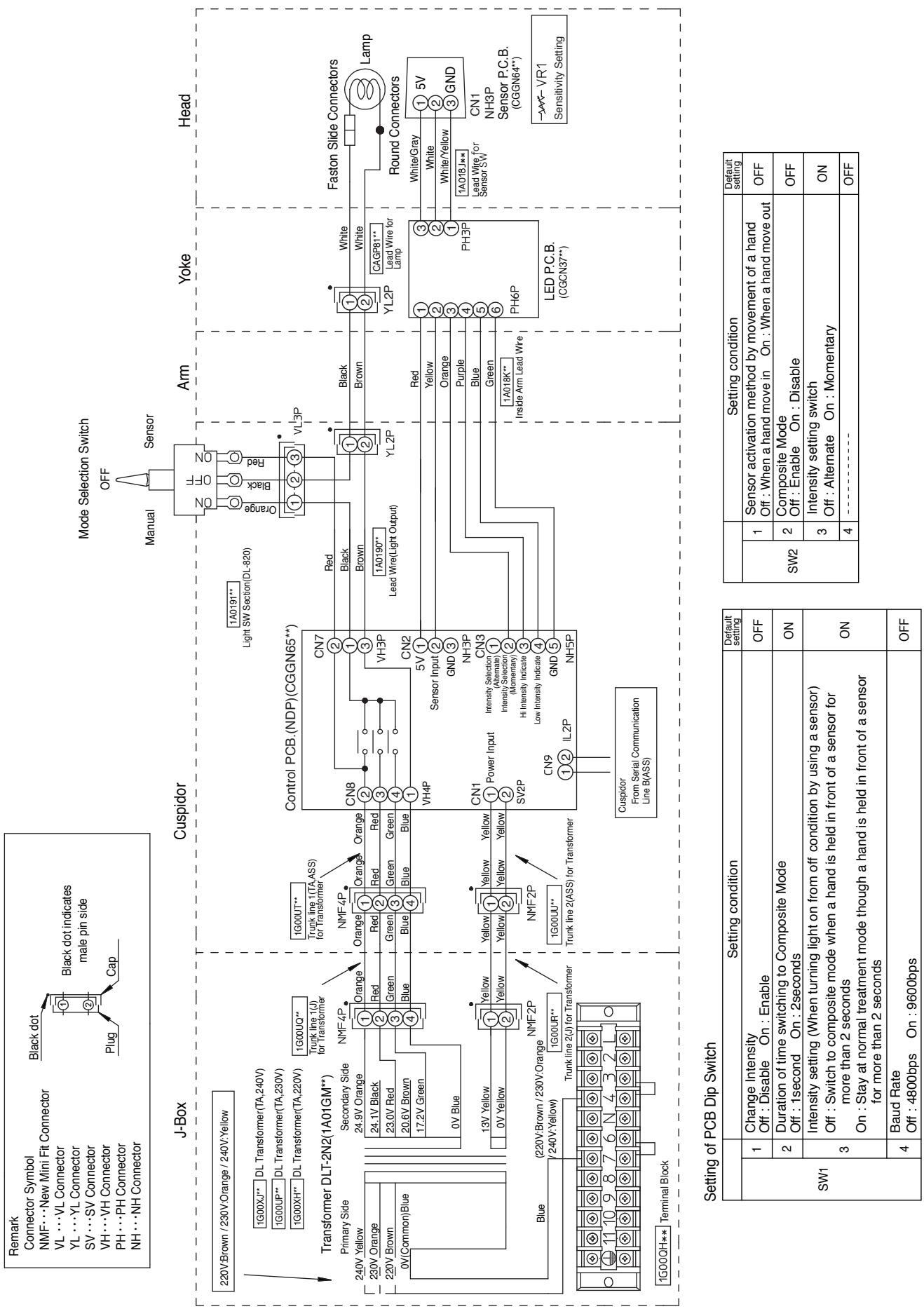


Setting of PCB Dip Switch

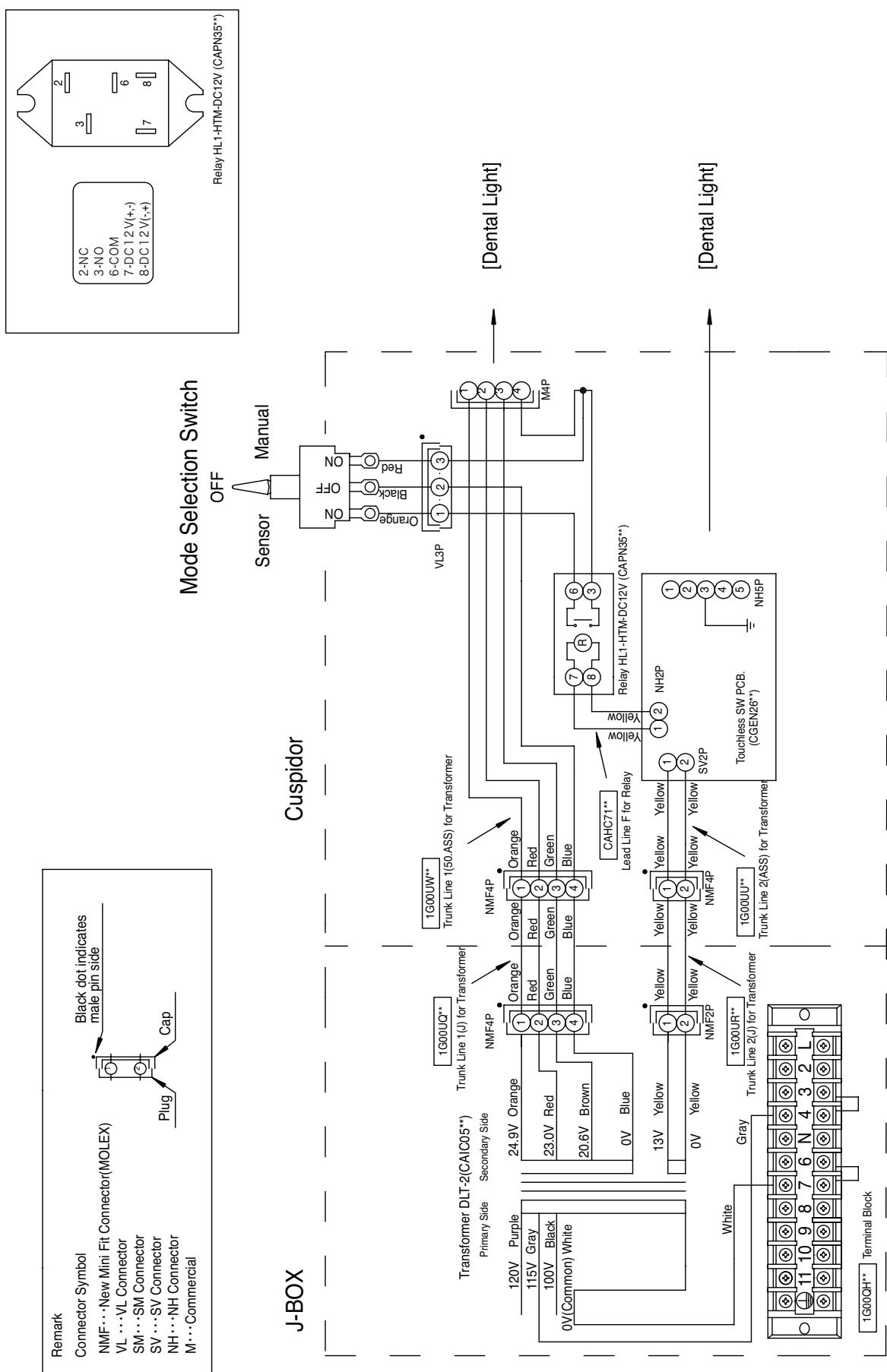
	Setting condition	Default setting	Setting condition	Default setting
1	Change Intensity Off : Disable On : Enable	OFF	1 Sensor activation method by movement of a hand Off : When a hand move in On : When a hand move out	OFF
2	Duration of time switching to Composite Mode Off : 1 second On : 2 seconds	ON	2 Composite Mode Off : Enable On : Disable	OFF
SW1	Intensity setting (When turning light on from off condition by using a sensor) Off : Switch to composite mode when a hand is held in front of a sensor for more than 2 seconds On : Stay at normal treatment mode though a hand is held in front of a sensor for more than 2 seconds	ON	3 Intensity setting switch Off : Alternate On : Momentary	ON
3			4	OFF
4	Baud Rate Off : 4800bps On : 9600bps			

	Setting condition	Default setting
1	Sensor activation method by movement of a hand	OFF
2	Off : When a hand move in On : When a hand move out	OFF
SW2	Composite Mode Off : Enable On : Disable	OFF
3	Intensity setting switch Off : Alternate On : Momentary	ON
4		OFF

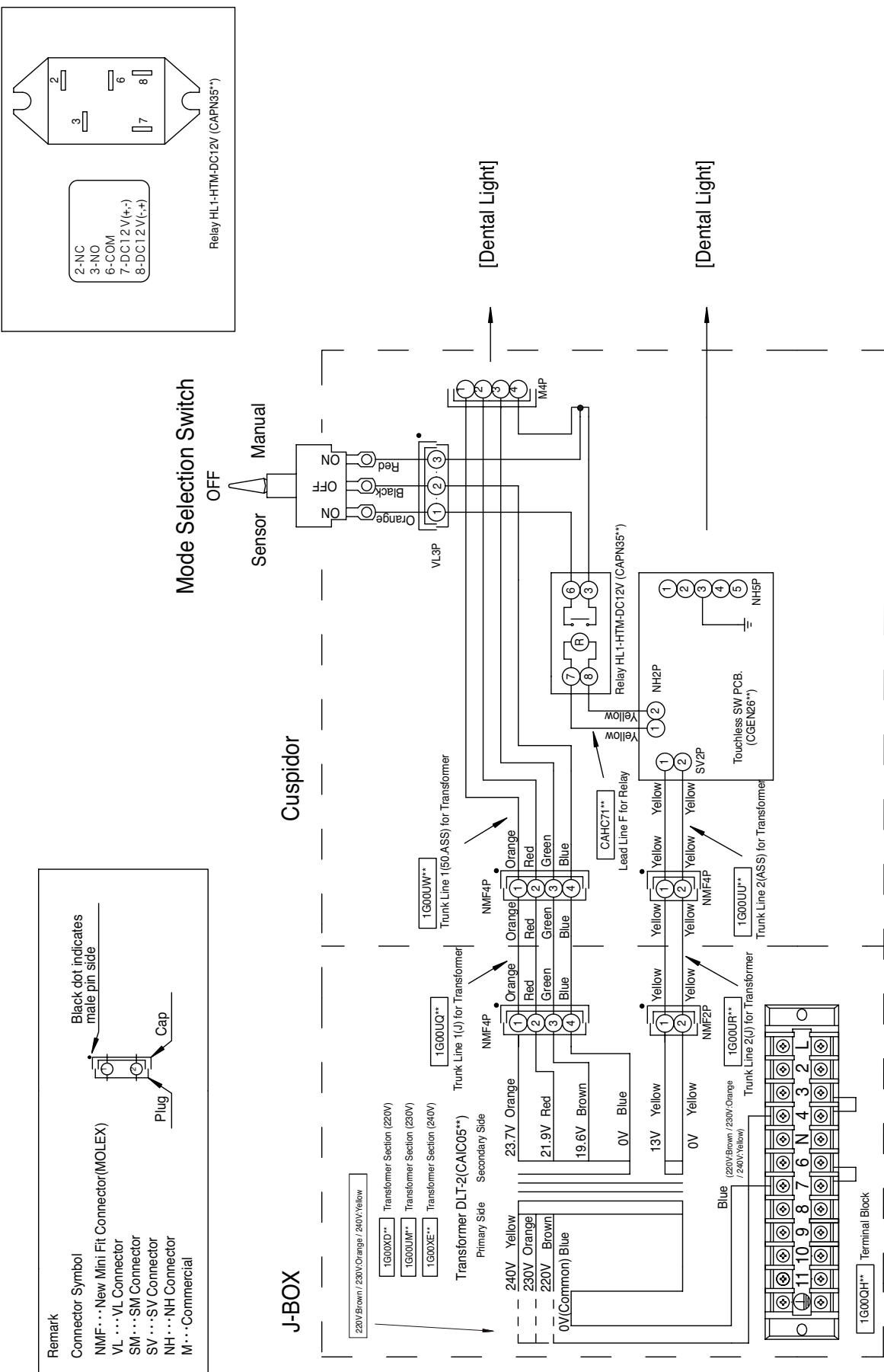
## 9-4. Dental Light AL-820S (220V, 230V, 240V)



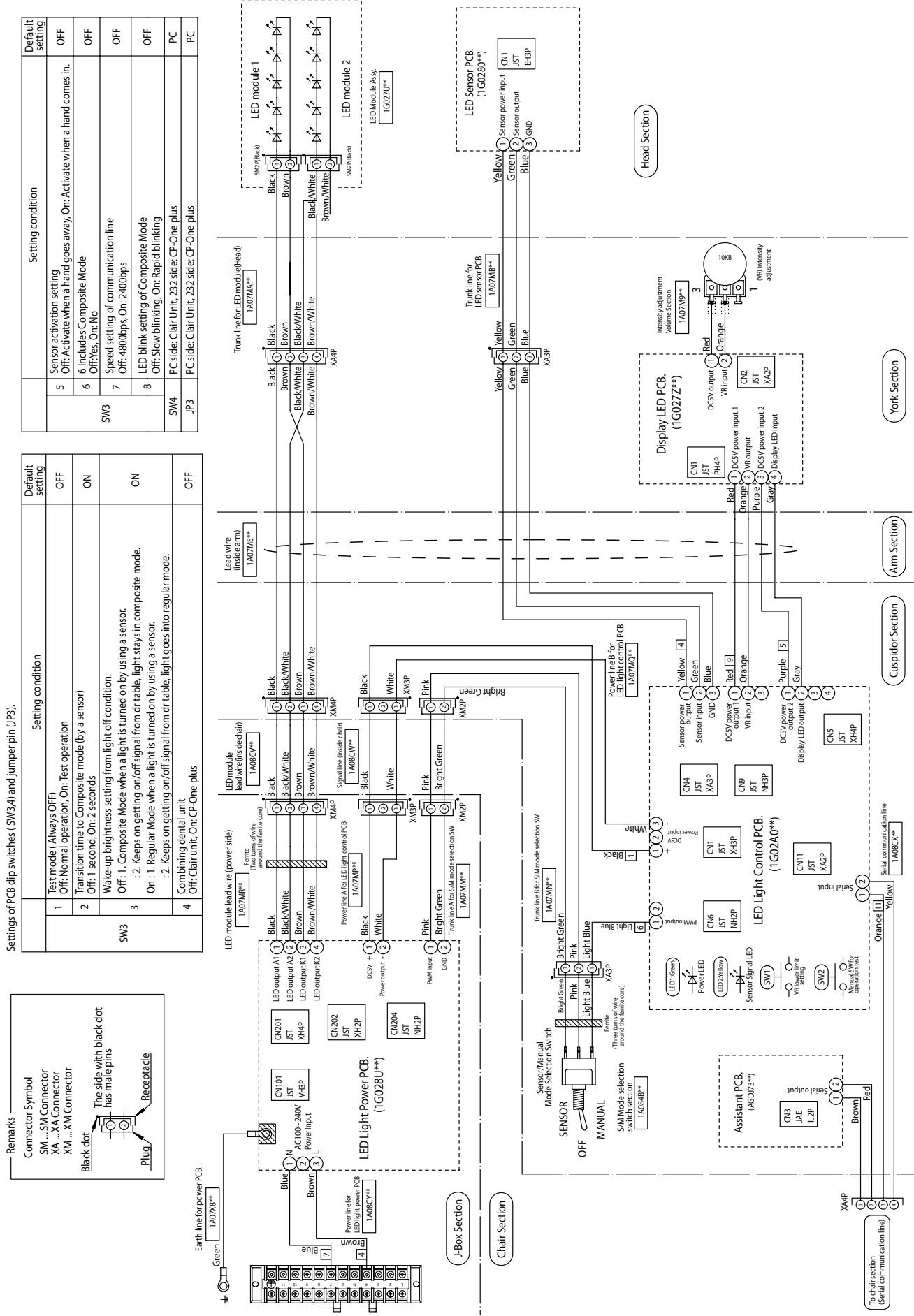
## 9-5. Dental Light AL-520S (115V)



## 9-6. Dental Light AL-520S (220V, 230V, 240V)



## 9-7. 900 Dental Light (Type 920)



# NOTE

 **Belmont**



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