



TU97 (EX), 05-CE. 15.12 TO

# Operation Manual

## Model

Dental Treatment Unit

**S I G N O**  
**T R E F F E R T**

**CE**  
0123

Model TU97

Thank you for purchasing the SIGNO TREFFERT.  
For optimum safety and performance, read this manual thoroughly before using the unit.  
Pay close attention to the warnings and cautions.  
Keep this manual in a handy location for ready reference.

**J.MORITA TOKYO MFG.CORP.**

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\* \* \*

## Attention:

### 1. CE Labeling

CE-Symbol of conformity. This symbol of conformity guarantees that this appliance conforms to the relevant safety guidelines of the European Union.

### 2. Guidelines

This appliance conforms to the following safety guidelines: Medical device guidelines 93/42/EEC, with amendments.

### 3. The manufacturer will not be responsible for accidents, equipment damage, or bodily injury resulting from the conditions and actions specified below:

- (1) Repairs, maintenance, modifications, handling, or installation performed by personnel who have not been authorized by the manufacturer.
- (2) Use of parts or components other than those specified by the manufacturer, or that are not in their original condition, is not permitted.
- (3) Repairs, maintenance, modifications, etc. using supplementary components other than those noted in the operating procedures described in this manual or resulting from a failure to follow the cautionary remarks and warnings in this manual.
- (4) Operating the equipment in ways other than those described in the operating procedures in this manual, or resulting from a failure to follow the cautionary remarks and warnings in this manual.
- (5) Workplace conditions and environment or installation conditions that do not conform to those stated in this manual.
- (6) Fires, earthquakes, floods, lightning, natural disasters, or Acts of God.

### 4. The operation and maintenance of medical devices is the responsibility of the user (hospital, clinic, laboratory etc.). This equipment must not be operated by any individual except doctors and dental technicians who are legally qualified to do so.

### 5. This equipment is accompanied by a warranty. The warranty must be filled out with the date of purchase, purchaser's name (hospital, clinic, laboratory, etc.) address, postal code, telephone number, and the dealer's name and signed by the purchaser. The dealer should receive a copy of the warranty and the purchaser should keep and carefully save the original.











# [1] General Safety and Operating Instructions

## 1.Safety Symbols and Indicators

This manual uses a system of safety symbols to promote and ensure safe operation, and to prevent injuries, accidents and damage.



- (1)Learn to recognize and understand the meanings of the various symbols shown below.
- (2)After reading this manual, keep it in a handy location for ready reference.
- (3)Follow all safety instructions without exception.

Following the above instruction should result in smooth operation of the appliance.



SAFETY SYMBOLS CHART	
 <b>WARNING</b>	This indicates the possibility of serious bodily injury or death and serious damage occurring if the safety instructions are not followed.
 <b>CAUTION</b>	This indicates the possibility of minor bodily injury or damage occurring if the safety instructions are not followed.
<b>Symbols</b>	 This symbol indicates a WARNING or CAUTION instruction.
	 This symbol indicates an operation or procedure that <b>MUST NOT</b> be performed.
	 This symbol indicates an instruction that <b>MUST BE</b> followed.
	 This symbol indicates a warning for high temperatures that <b>MUST BE</b> followed.
	 This symbol indicates an instruction a pay attention to dangerous voltage.
	 This symbol indicates the B type cavity that <b>MUST BE</b> followed.
	 This symbol indicates an instruction Main Switch(ON/OFF).
	 This symbol indicates that reference to the operation manual is needed.

## 2. Operation Advice and Hints

Certain key points concerning operation are indicated by the symbols shown in the chart to the right. These are points to make it easier for the operator to use the equipment.

Advice Hints Symbols Chart	
 <b>ADVICE</b>	Indicates advice concerning operation.
 <b>CHECK</b>	Indicates points that should be checked during operation.

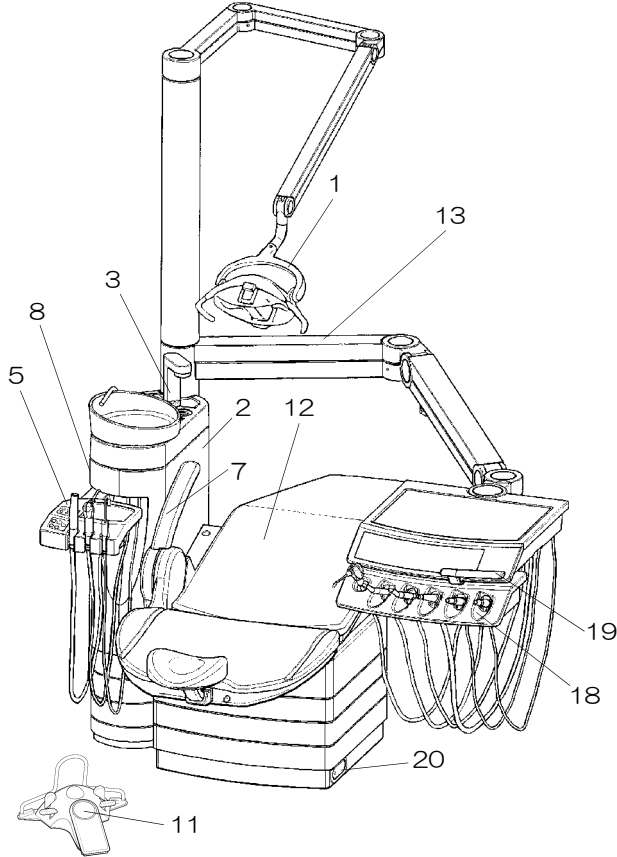
## 3.Operational Purpose of Equipment

 <b>WARNING</b>	
	<b>The SIGNO TREFFERT is a dental treatment unit and must not be used for any other purpose.</b> >>Use for any purpose not designated is dangerous and could result in accidents or damage to equipment.

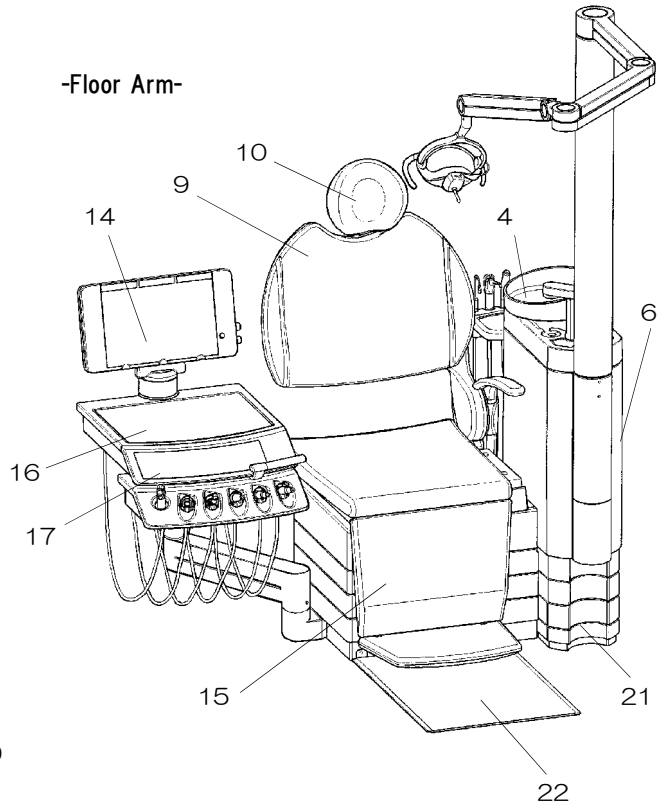
# [2]Parts Identification

## <Main Unit>

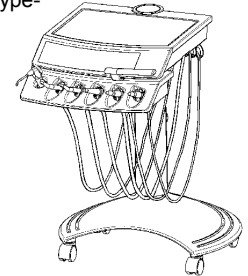
-Over Arm-



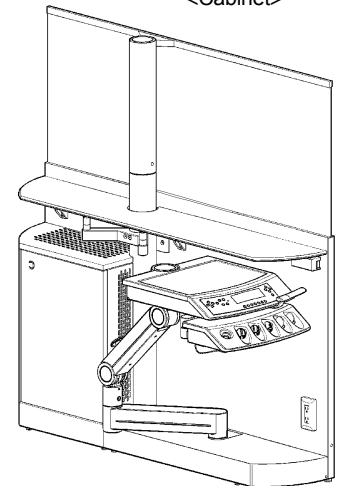
-Floor Arm-



-Cart Type-



-Communication Model-  
<Cabinet>



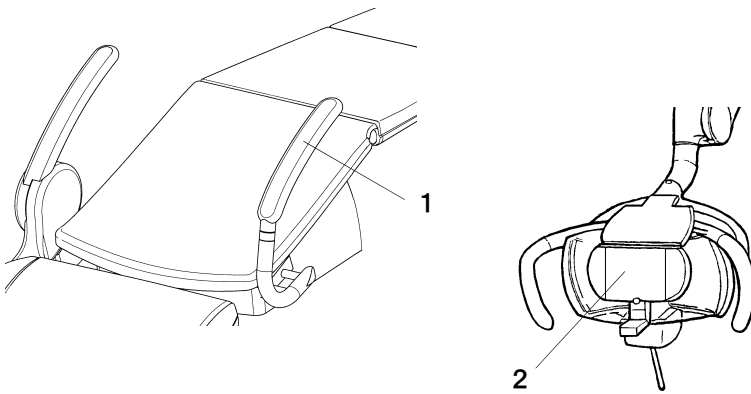
No.	Identification
1	Operating Light
2	Basin Unit
3	Auto Filler
4	Basin
5	Assistant's Instrument Holder
6	Basin Unit Door
7	Assistant's side Arm Rest
8	Water and Air Snap-on Connections
9	Back Rest
10	Head Rest
11	Foot Switch

No.	Identification
12	Seat
13	Tray Arm
14	Film Viewer *
15	Leg Rest **
16	Dentist's Tray
17	Dentist's Switch Panel
18	Dentist's Instrument Holder
19	Tray Handle
20	Main Switch
21	Plumbing Pit and Bacteria Filter
22	Safety Mat **

\* : Option

\*\* : Step Type only

<Options>



No.	Parts Identification
1	Movable Arm Rest on Dentist's side
2	Re-Trak Mirror

<Accessories>

- 1)Tray Paper :1Package
- 2)Paper Cups :1Package
- 3)Star Caps for Paper Cups :1Package
- 4)Silicone Vial Holder :1
- 5)Head Rest Cover :1
- 6) Extra Fuses :1set
- 7)Cleaner Solution "Denta coco" :1

- 8)Operation Manual :1
- 9)Installation Manual :1
- 10)Warranty :1



Also parts and components for the instruments selected.

**CHECK**


Regarding the Communication Model Specification, please refer to the 'Communication Model Operator Manual' beside this manual.

## [3]Installation

### WARNING

	<p><b>The equipment must be installed by a qualified and trained professional specified by J.Morita Corp. according to the conditions specified in the Installation Standards Manual.</b></p> <p>&gt;&gt;Otherwise, there is a risk that an accident or damage to equipment may occur.</p>
	<p><b>The unit must be fastened and fixed to the floor securely as specified in the installation manual.</b></p> <p>&gt;&gt;Otherwise, the chair could fall over resulting in injury or damage.</p>
	<p>The equipment <b>MUST NEVER</b> be connected to an electrical supply source that does not have the specified voltage, current, frequency and power characteristics.</p> <p><b>Each unit must have its own devoted electrical circuit connection and should not share a circuit with other units or other types of equipment.</b></p> <p>&gt;&gt;Otherwise, short-circuiting or overheating may result in injury or damage.</p>
	<p><b>Never splash the equipment with water or place it in an area where it could get wet.</b></p> <p>&gt;&gt;This will create the danger of short-circuiting or overheating, which may result in injury or damage.</p>
	<p><b>Do not install the unit in an area where chemicals are stored or where gas could be released.</b></p> <p>&gt;&gt;This would create the danger of fire or electric shock resulting in injury or damage.</p>
	<p><b>Do not route the power supply cord, the earth lead or the foot control cord through areas such as doorways and halls where they could be damaged.</b></p> <p>&gt;&gt;This would create the danger of short-circuiting and electric shocks, which may result in injury or damage.</p>

### CAUTION

	<p><b>Do not tilt the equipment or place it in an unstable position; do not expose it to excessive vibrations, bumps or shocks.</b></p> <p>&gt;&gt;Doing so could cause it to malfunction or damage it.</p>
	<p><b>Do not install the equipment in areas where it will be exposed to excessive atmospheric pressure, humidity, temperatures, wind, direct sunlight, dust, salts or sulfur compounds.</b></p> <p>&gt;&gt;Any of the above conditions could cause the equipment to malfunction or damage it.</p>
	<p><b>The unit must be installed in a room appropriate for dental treatment.</b></p> <p>&gt;&gt;If the installation location is not suitable, the unit may not only fail to perform optimally, but it could malfunction as well.</p>
	<p><b>Please take note of the following system requirements:</b></p> <ul style="list-style-type: none"> <li>1) Temperature : 10~40°C</li> <li>2) Humidity : 30~75%RH (not be dewy)</li> <li>3) Air pressure: 700~1060hPa</li> </ul> <p>&gt;&gt;Deviation from any of the above conditions could cause the equipment to malfunction or result in damage.</p>

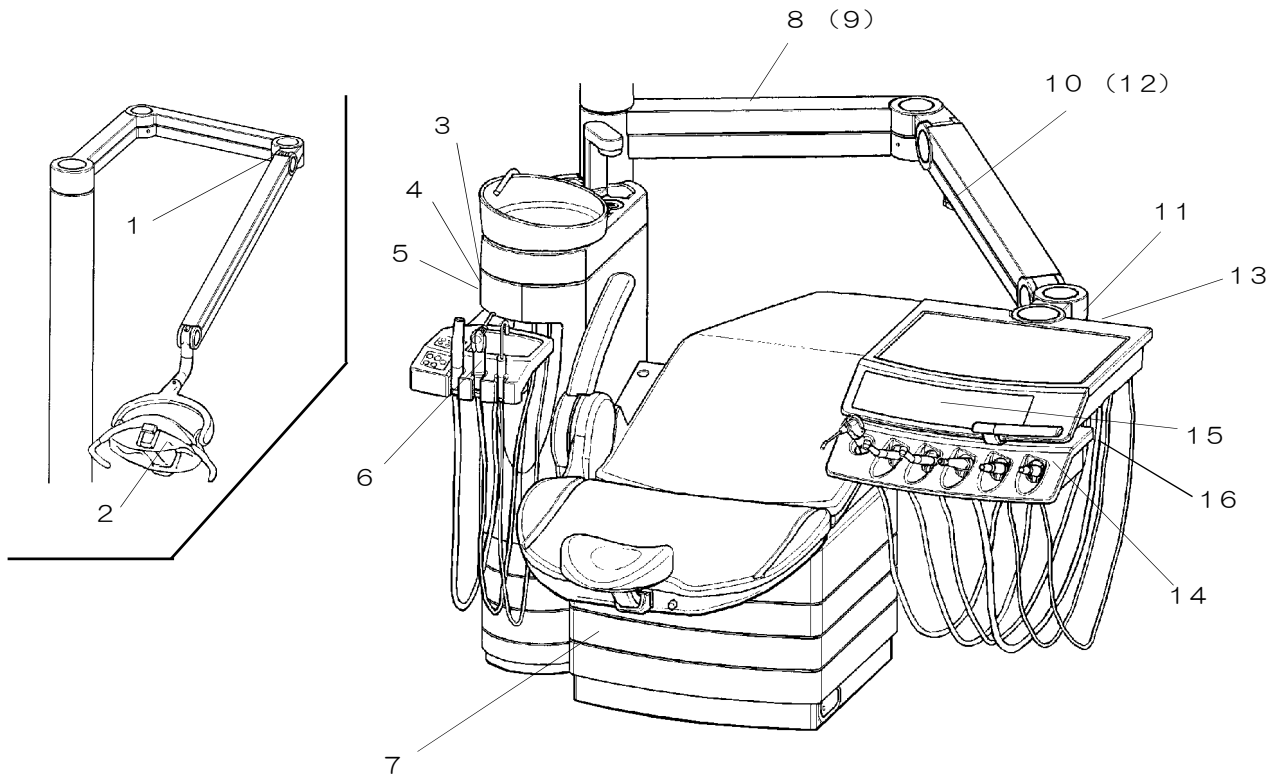
# [4]Preliminary Adjustments and Connections

## 1. Various Adjustments and Settings

The items in the diagrams and chart below can be adjusted in various ways.

To adjust an item, refer to the chart and then consult the part of the Operation section (5.Operation) of this manual noted there or the installation manual.



Contact your local dealer or J.Morita Corp.concerning any points that are not clear, or items not appearing in the diagrams and chart below.



No.	Item	Reference	No.	Item	Reference
1	Light Arm Movement	Installation Manual	10	Tray Arm Motion	9 (1)
2	Light Focal Distance	13 (1)	11	Tray Arm Angle	Installation Manual
3	Water Volume	8 (1)	12	Height for Cart Tray	9 (2)
4	Warmer Temperature	7 (2)	13	Tube Lifter Wire Length	12 (3)
5	Water Volume for Snap On Connection Auto Filler Water Volume	7 (3)	14	Dentist's Instrument Holder Angle	Installation Manual
6	Three-way Syringe Air Temperature	6 (4)	15	Auto Position	3 (1)
7	Chair Movement Speed	3 (1)	16	Instrument Air and Spray Volume	6 (9)
8	Over Arm Brake	Installation Manual	17	Communication Model various setting.	Extra number
9	Floor Arm Brake	Installation Manual			



## 2. Instrument Connections

 CAUTION	
	<p><b>Before using the equipment, connect all the main instrument tubes. The three-way syringes should also be connected</b> (except for the one-touch detachable WS90, option).</p> <p>&gt;&gt;Otherwise, air or water could leak out.</p>
	<p><b>All instruments must be in their specified holders except when in use.</b></p> <p>&gt;&gt;Otherwise, an injury or damage could result from using the vacuum syringe or some other instrument.</p>

Connect the main tubes for the doctor's instruments to their tray and those for the assistant to the assistant's tray.

Then put all the instruments in their specified holders. Refer to the chart at the right and the instructions below.

Main Tube Connections: See section [5]5 of this manual.



>>Three-way Syringe Body and Nozzle Attachment: Section [5] 6. (5) of this manual

>>Vacuum Syringe and Saliva Ejector: Section [5] 6. (6) and (7) of this manual

>>Various Instruments: Individual operator's manuals for each instrument

Main Tube Connections
Blue: Three-way Syringe
Yellow: Air Turbine (with light)
Green: Air Turbine (without light)
Red: Micro motor (with light)
White: Micro motor (without light)
Purple: Ultra Sonic Scaler

## 3. Install the Filters

 CAUTION	
	<p><b>All the filters must be installed before the equipment is used.</b></p> <p>&gt;&gt;If the filters and their covers are not correctly installed, the equipment may not perform satisfactorily or could be damaged. Also water, air or vacuum lines could become blocked.</p>


The chart shows the various filters that are required and supplied with the equipment.


Refer to Section [6] Maintenance in this manual for installation instructions.

Filters	
1	Vacuum Cut Filter
2	Basin Filter
3	Drain Trap Filter
4	Oil Drain Filter
5	Water Bacteria Filter
6	Air Bacteria Filter


[5] Operation

 **WARNING**

	<p><b>Do not place any objects below or near moving parts such as the seat and back rest or within the range of their movement. Keep hands, fingers and feet clear of all moving parts.</b>(See “Illustrated Guide to Cautionary Points”)</p> <p>&gt;&gt;Otherwise, fingers or other body parts could be pinched resulting in injury or damage.</p>
	<p><b>Do not place heavy objects, sit or exert excessive force on the edges of the seat,back rest, head rest, light or tray. Never stand on, climb on or jump on or off the equipment.</b></p> <p>&gt;&gt;These actions could cause the equipment to fall over resulting in injury or damage.</p>
	<p><b>Do not spill fluids or place flammable or metal objects inside the equipment.</b></p> <p>&gt;&gt;This could result in injury or damage due to fire, electric shock or other accidents.</p>

	<p><b>Avoid accidents that could result in bodily injury or equipment damage by paying attention to the points listed below:</b></p> <p>1)Ensure the equipment is only used by specified and qualified operators. Do not allow anyone to operate the equipment randomly or play with it.</p> <p>2)Keep an eye on the patient at all times.</p> <p>3)Do not let patients assume risky positions (legs sticking out, standing on seat, sitting with their legs folded under them etc.)</p> <p>4)Do not require patients to sit or move in stressful ways. (E.g., sudden head rest movement if patient has a sore neck or lying face up if patient has a sore lower back etc.)</p> <p>5)Keep fingers and other parts of the body, bags and other personal belongings clear of moving parts and the areas in which these parts move (e.g., joints in tray arm, back rest etc.)</p> <p>6)Only one person at a time should occupy the seat; do not allow children to sit with their mother or father during treatment.</p> <p>7)Do not allow people especially children to loiter or play near the chair.</p> <p>8)Do not allow the light, tray, or other parts of the equipment to lean on or make contact with walls, windows, cabinets or other equipment and objects. (Avoid hitting things,etc.)</p> <p>9)Avoid any other actions that seem dangerous.</p> <p>10)Avoid any other conditions that seem dangerous.</p> <p>&gt;&gt;Not paying sufficient attention to the above points could result in injury or damage.</p>
	<p><b>If the danger of an injury or accident occurring suddenly arises while auto-positioning is being carried out, stop the chair immediately using any one of the emergency stop procedures listed below:</b></p> <p>A)Step on the foot panel</p> <p>B)Operate any of the manual positioning levers on the foot control. (Operating the levers for the seat or back rest, up or down, will all stop the chair.)</p> <p>C)Turn the main switch off.</p> <p>&gt;&gt;Not taking timely action to stop the chair could result in injury or damage.</p>

 **CAUTION**

	<p><b>Do not use pointed tools to push the various panel switches or scratch the surface covering of the switches.</b></p> <p>&gt;&gt;Doing so could cause a malfunction or lead to abnormal operation.</p>
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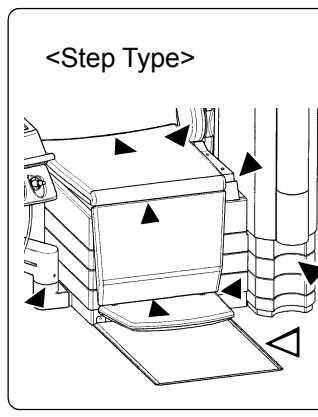
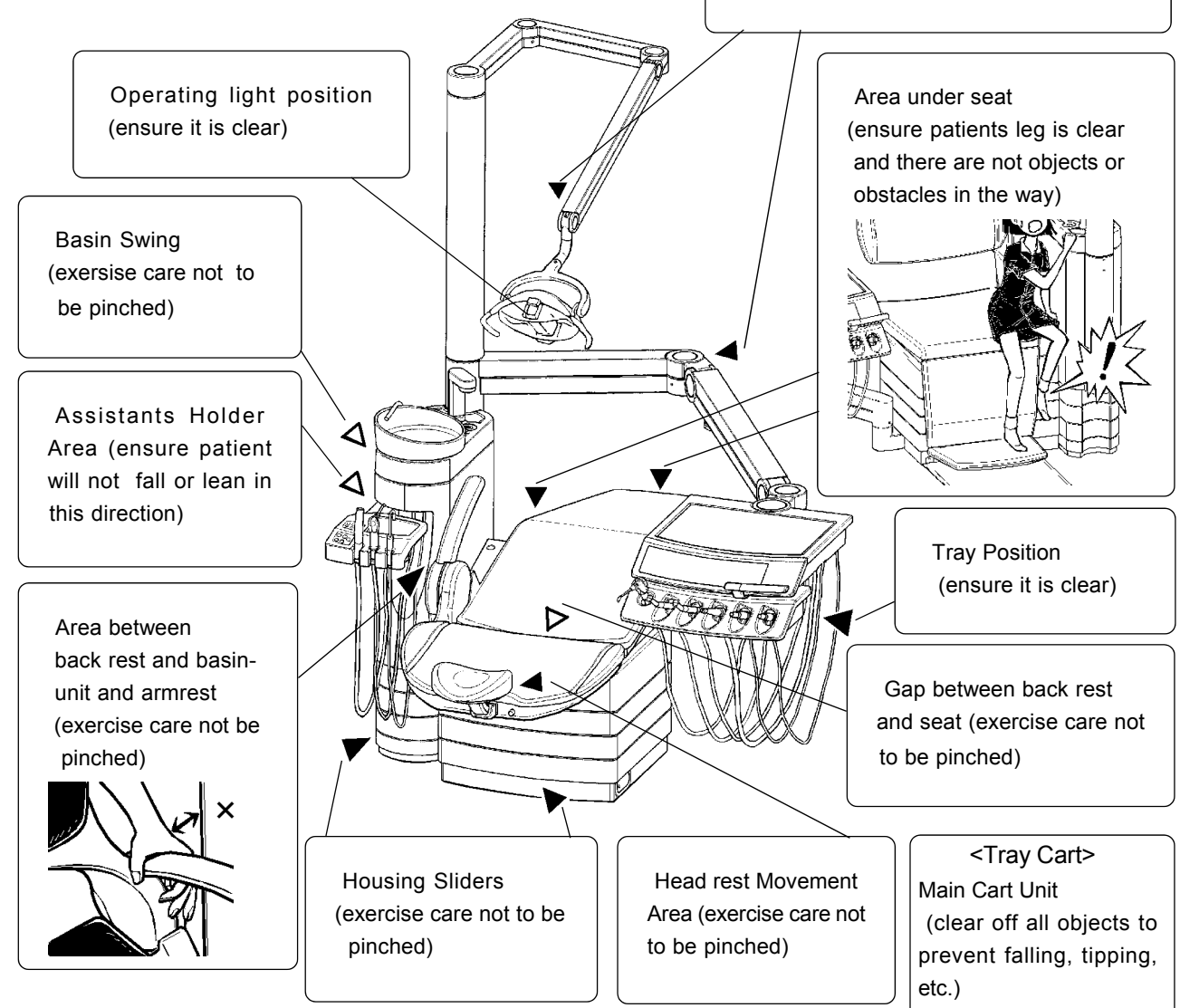
◆ Illustrated Guide to Cautionary Points

(During chair movement)

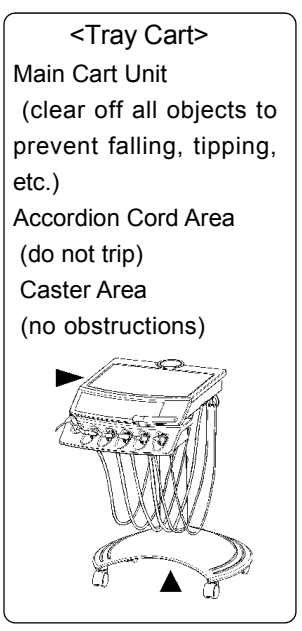
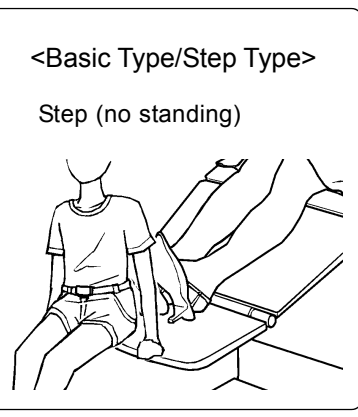
Always check for safety before moving the chair manually or with auto-positioning.

In particular, pay attention to the points noted in the illustration below so that the patient or other equipment is not hit or pinched, etc.




▲: Watch out for moving or rotating parts etc.  
△: Indicates an emergency stop is required



Between step and safety mat (clear off all objects)  
Seat Movement Joints (exercise care not to be pinched)

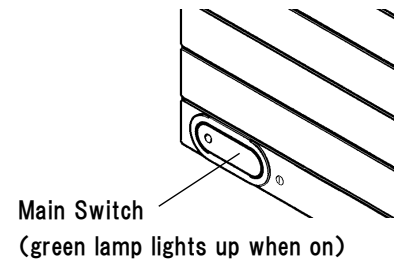


# 1. Main Switch

 CAUTION	
	<p><b>Never bump or bang the equipment or expose it to excessive vibration while the main switch is on.</b></p> <p>&gt;&gt;Doing so could cause an accident resulting in injury or damage.</p>
	<p><b>Always turn the main switch off after treatment, during breaks in treatment or whenever the unit is not in actual use.</b></p> <p>&gt;&gt;Otherwise, an accident could occur resulting in injury or damage.</p>
	<p><b>Turn the main switch off before using an electric scalpel in the immediate vicinity of the equipment.</b></p> <p>&gt;&gt;Otherwise, electromagnetic waves emitted by the electric scalpel could cause the equipment to operate in a sporadic or abnormal way resulting in an accident causing injury or damage.</p>

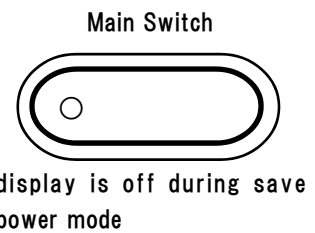
## (1)Operation

The main switch is located on the lower part of the housing.  
Press it to turn the unit on. It lights up when it is turned on and all the instruments etc. can then be operated. Press it again to turn the unit off.



## (2)Save Power Function

For both safety and economy, the unit automatically enters the save power mode if it has not been used for the set period of time.  
In the save power mode,  
>>The operating light goes out.\*\*  
>>The operating light and its indicator go out.  
>>The power for chair operation and the gas burner is turned off.  
>>The water is turned off.




When in save power mode, normal operation can be restored by pressing any of the doctor or assistant's operation switches, stepping of the foot pedal, or picking up an instrument.

\*\* : The save power mode can be turned off, or it can be set to activate after 60 or 120 minutes. See section [5]5 3. (7)User Settings" of this manual.

\* : Ootion

## 2. Foot Control

### ⚠ CAUTION

	<p><b>Please do not assume any dangerous positions when riding on the foot control, foot pedal or operation levers.</b></p> <p>&gt;&gt;Not paying sufficient attention to the above points could result in injury or damage. Once the foot control gets wet, do not use the same place again while it is still wet.</p>
	<p><b>Please restart use after moisture has been wiped off with the main switch turned off, and after it has dried naturally.</b></p> <p>&gt;&gt;Not observing the above could result in injury, damage, electric shock or other accidents.</p>
	<p><b>Never place a load greater than 10N (1kgf) on the foot control, foot pedal or operation levers.</b></p> <p>&gt;&gt;Doing so could cause a malfunction or load to abnormal operation.</p>
	<p><b>Please do not place the foot control on an incline or upside down.</b></p> <p>&gt;&gt;Doing so could cause a malfunction or load to abnormal operation.</p>

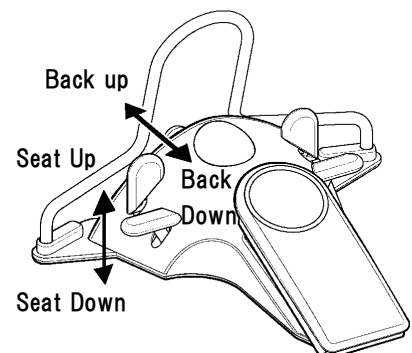
### (1)Manual Chair Operation Levers

#### 1)Operation

Use these levers to raise or lower the back rest and seat.

The chair moves only while one of the levers is actually being pressed.

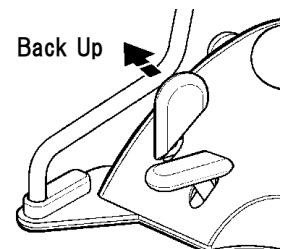
The seat and back rest will stop automatically if they reach their upper or lower limits. Release the lever when this happens.



#### 2)Maximum Back rest Angle

The back rest normally goes up to a 70° angle, but it can be raised up to 78° in the following way:

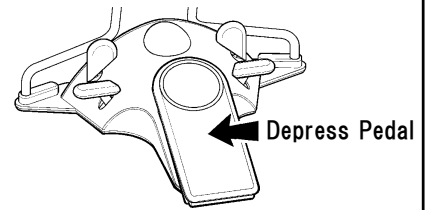
- Hold the back rest lever until the backrest automatically stops at 70°.
- Release the lever and then press it again to raise it up to 70°.



**(2)Foot Pedal**

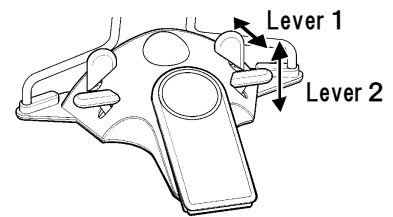
**1)Instrument Operation**

Use this pedal to operate the doctor's instruments.  
 Step on the pedal to operate whichever instrument has been selected.  
 A safety circuit prevents the chair from moving whenever the foot pedal is being used.



**(3)Extended Function Levers(FC97NA)\***

The functions of these levers depend on whether an instrument has been picked up or not. Each lever has 4 possible functions.

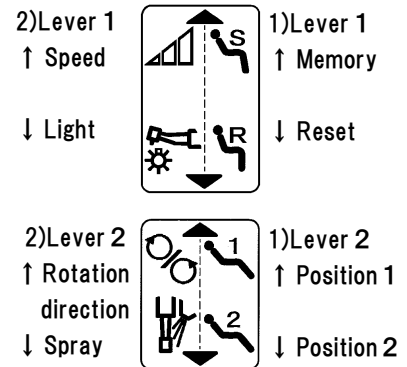


**1) Auto-positionig Switches\*\***

Chair Auto-Positioning (Some functions may not be possible depending on the combination of various options.) If all instruments are put away, the levers can be used for auto-positioning. (See illustration to the right.) For details,see section [5] 3. (1) of this manual.

**ADVICE**

The lever must be held for at least 1 second before the chair starts to move. This is to prevent accidental activation.



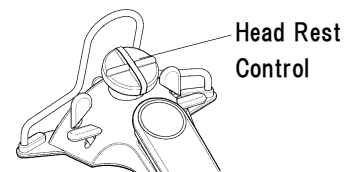
**2)Instrument Settings\*\***

Instrument Control (Some functions may not be possible depending on the combination of various options.) If an instrument has been picked up, these levers can be used to make various adjustments. (See illustration to the right.) For details, see section[5] 3. (5) of this manual.

\*\*: Some functions may not be possible depending on the combination of various options.)

**(4)Head Rest Motor Control(FC97ND/DA)\***

Use this to control the head rest motor. For details, see section [5] 14 of this manual.



\*: Option

### 3. Dentist's Switch Panel

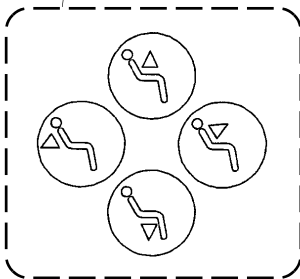
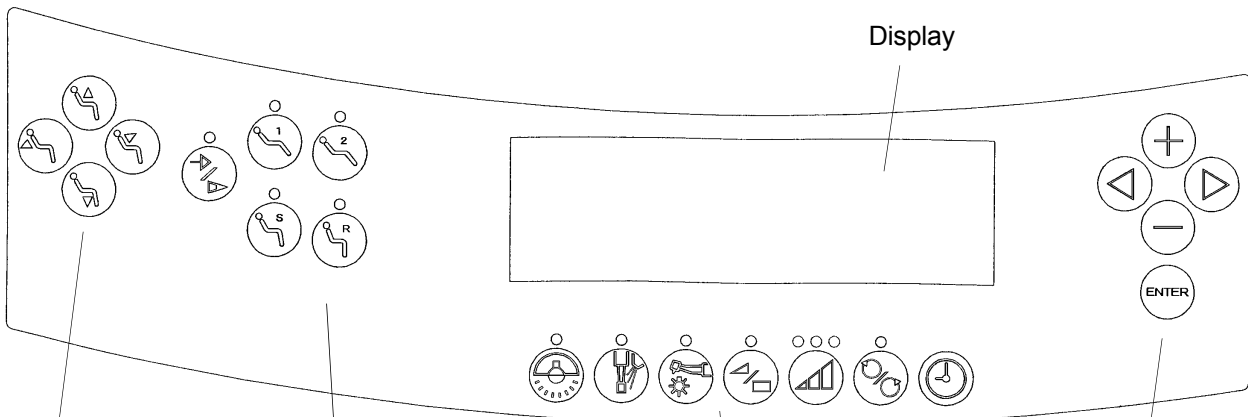
 CAUTION



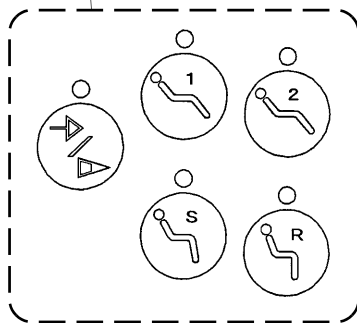
**Do not use pointed tools to push the various panel switches or scratch the surface covering of the switches.**

>>Doing so could cause a malfunction or load to abnormal operation.

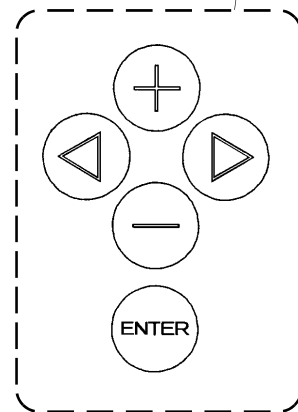
<Dentist's Switch Panel>



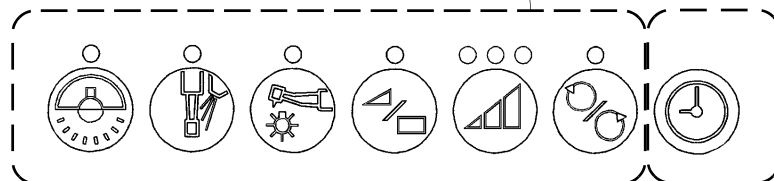
(3)Manual Positioning  
Switches



(1)Auto-positioning Switches



(4)Set Switches

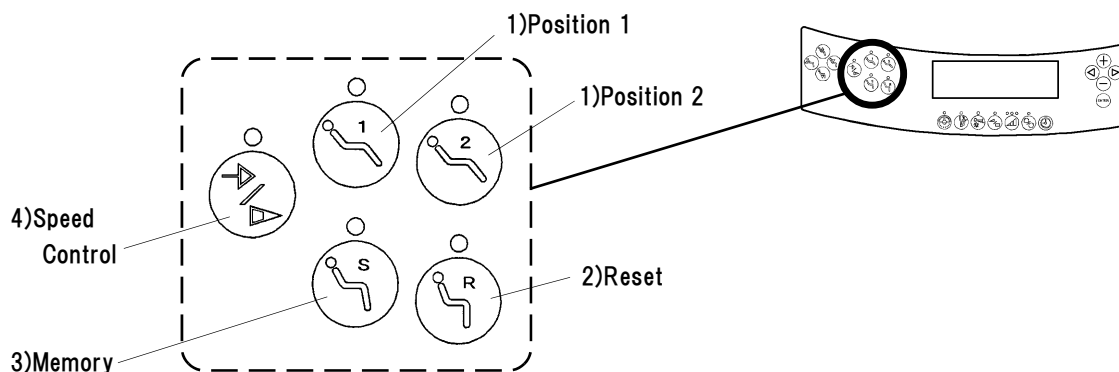


(5)Instrument Settings

(6)Timer Switch



## (1)Auto-positioning Switches



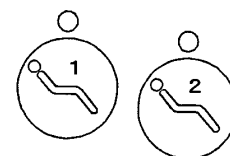
These switches are used to raise and lower the seat and back rest.  
The seat and back rest automatically move into one of the preset positions when one these switches is pressed once.

### 1)Treatment Positions 1 and 2

These are usually used for treatment.

The chair moves into the preset position when the switch is pressed.

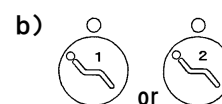
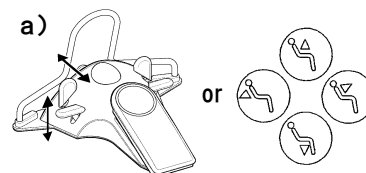
These positions can be adjusted. (See below.)



Green lamp flashes while moving, stays on when stopped

#### <Setting the Treatment Positions>

- Use the levers on the foot control or the manual switches to position the chair at the desired angle. [Section (3) below]
- Hold down the switch that corresponds to this position (1, 2 or reset) for 5 seconds.
- Keep holding the switch down until a beep sounds to indicate that the position has been stored in memory.



### 2)Reset

Used before and after treatment.

Seat goes down to its lowest position and back rest goes up to about 70°. (Factory settings.)

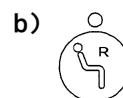
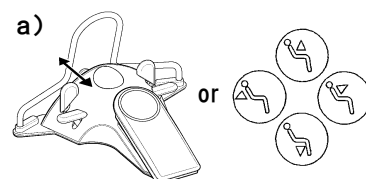
This position can be adjusted. (See below.)



Green lamp flashes while moving, stays on when stopped

#### <Setting the Treatment Positions>

- Use the levers on the foot control or the manual switches to position the chair at the desired angle. [Section (3) below]
- Hold down the switch that corresponds to this position (1, 2 or reset) for 5 seconds.
- Keep holding the switch down until a beep sounds to indicate that the position has been stored in memory.



### 3)Memory

This is used when the patient needs to rinse his/her mouth.  
 The chair temporarily stores its present position in memory and will return to it when the patient has finished rinsing his/her mouth.  
 Press this switch to raise the backrest up to about 70°.  
 Press it again after the patient has finished rinsing his/her mouth to return the back rest to its original treatment position.



A green lamp flashes while moving, and stays on when stopped

### 4) Two speed Control

The chair has two speeds. This is the same for both auto and manual positioning.  
 Press the switch to go into Slow Speed. (Lamp is amber.)  
 Use this mode for senior citizens or patients who have been anesthetized.  
 Press the switch again to go back to Standard Speed.  
 (Lamp is green.)

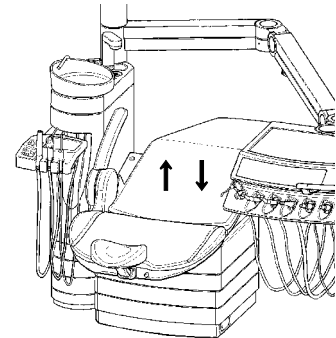


Standard Speed : Green Lamp  
 Slow Speed : Amber Lamp ON

### 5) Shock-free Mechanism

Chair speed is controlled to reduce the jerking when the chair stops.  
 This is the same for both auto and manual positioning.  
 However, it does not work in the case of an emergency stop. [See (2) below.]

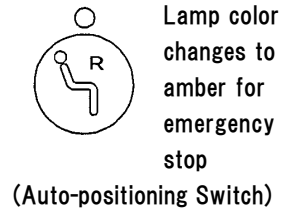
**ADVICE** With shock-free motion, the chair's stopping position may be slightly different.



Reduced jerking when chair stops

## (2)Emergency Stop for Auto-positioning, Cancel, and safety Stop

Use the procedures listed below to stop the chair in the midst of auto-positioning is being carried out. In the case of a Safety Stop, the chair stops automatically and goes into Avoidance Mode. This means it will reverse its direction slightly after stopping. Whenever the chair stops while auto-positioning is being carried out, the color of the lamp for the positioning switch changes to amber.



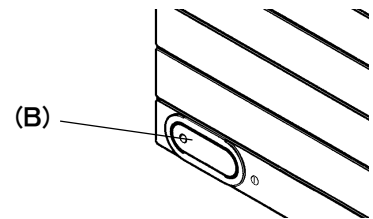
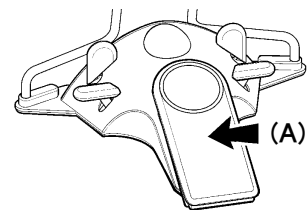
### 1)Emergency Stop

Use this in the case of imminent danger.

Even if the chair has a shock-free stop function, it will stop instantly when either of the following methods is used:

(A) Stepping on the foot pedal.

(B) Turning off the main switch.



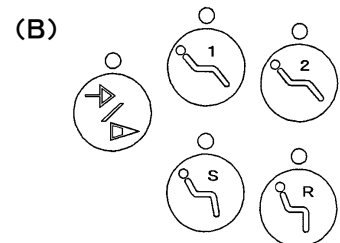
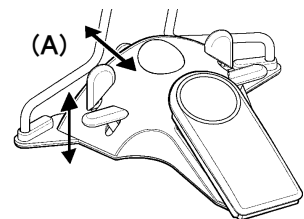
### 2)Cancel

Use this to stop the chair during auto-positioning. If the chair has a shock-free stop function, it will function normally. Use any one of the following methods:

(A) Press any of the auto-positioning switches on either the doctor or assistant's side.

(B) Press any of the manual positioning switches on the doctor's switch panel.

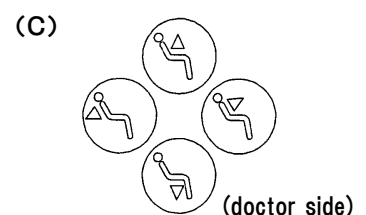
**ADVICE** Even if the chair does not have speed control, pressing the speed control switch will stop it.



(both doctor and assistant side)

(C) Operate any of the manual positioning functions on the foot control.

(Seat or back rests, up or down, will all stop the chair.)

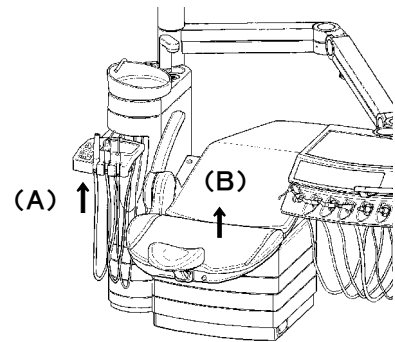


### 3)Safety Stop and Avoidance Mode

Auto-positioning will stop if something presses up against on the assistant's instrument holder (A) or the back rest (B).

**ADVICE**

The display will indicate either a safety stop or a safety lock. After checking the appropriate areas and removing any obstacles, resume normal operation.



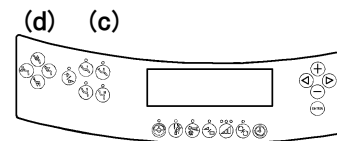
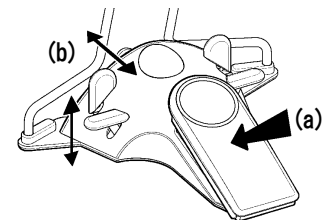
After a safety stop has been executed, the unit goes into Avoidance Mode. This allows one to reverse the direction of the chair's movement to release any objects that have been accidentally caught by it. Reverse the chair's movement using any of the following methods:

- (a) Step once on the foot pedal
- (b) Operate one of the positioning levers on the foot control  
(Seat or back rest, up or down, will all work)
- (c) Press any one of the auto-positioning switches on either the dentist or assistant's side.
- (d) Press one of the manual positioning switches on the dentist's side.



Lamp color changes to amber for emergency stop

(Auto-positioning Switch)



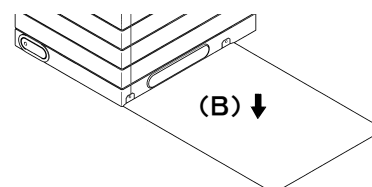
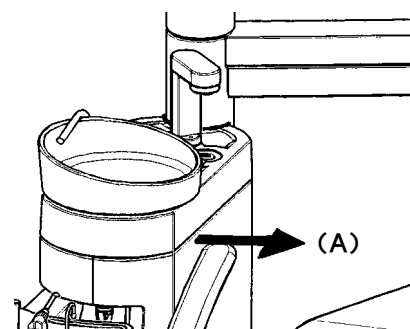
### 4)Safety Lock

The safety lock works hereafter, the chair operation stops and will not re-start in the case of cinditions (A) and (B) below.

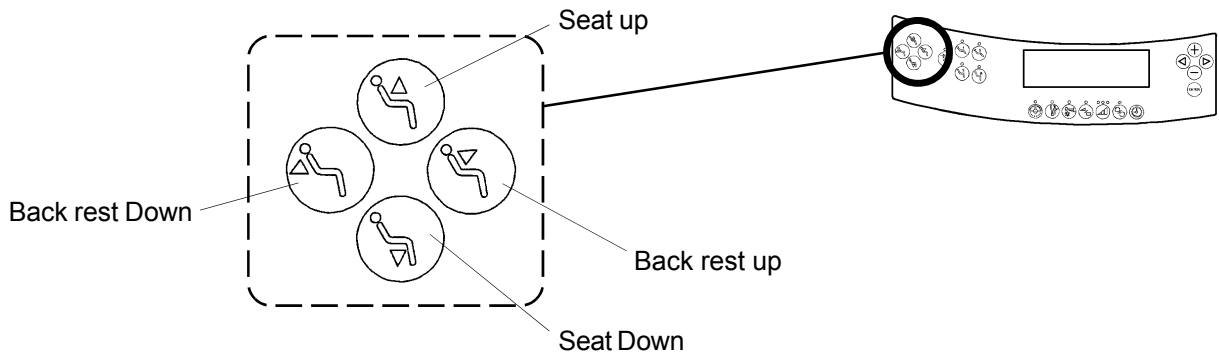
**ADVICE**

The display will indication if the safety lock works hereafter. After checking the appropriate areas do return it appropriately.

- (A)Remove the moving basin to the patient side.  
>>Returns it to former position.
- (B)Pressure hangs to the safety mat under the step.  
(Step Type)  
>>Remove objects on the safety mat.



### (3)Manual Positioning Switches

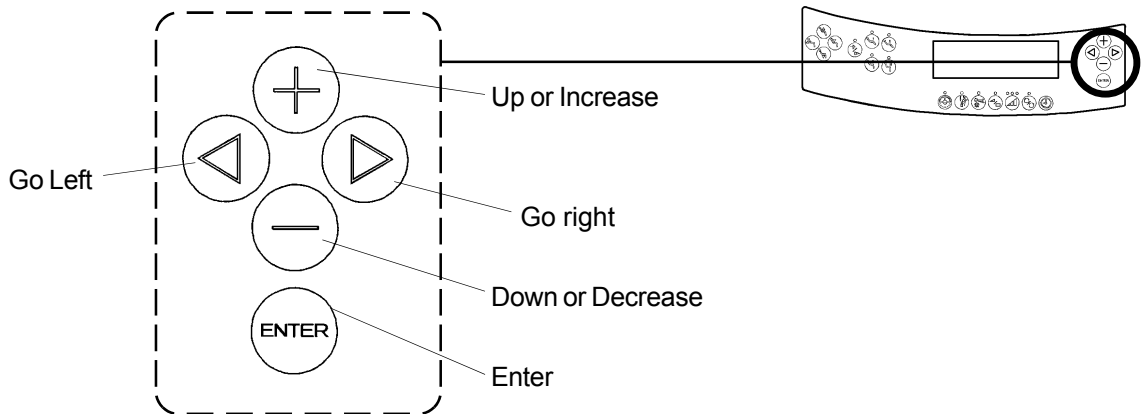


Use these switches to move the seat and back rest up and down in the same way as the levers on the foot control are used to execute the same movements(See section [5] 2(1) of this manual.)

#### 1)Operation

Simply press the appropriate switch to move the seat or back rest up or down.

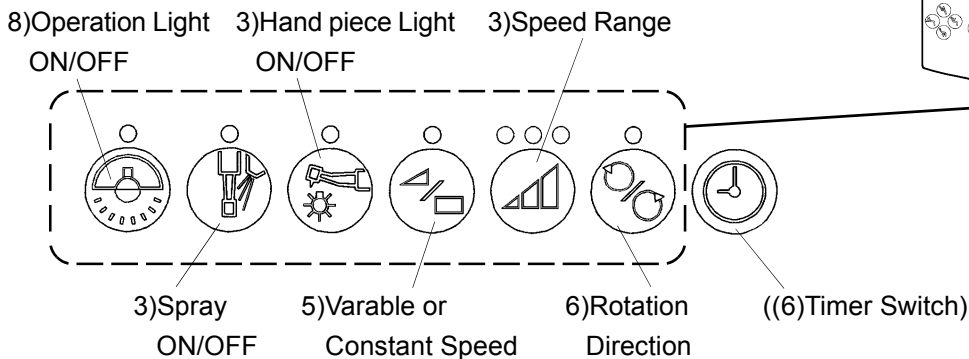
### (4)Set Switches



These switches are used in combination with various changeover switches (see following section) to change settings and values. Values or settings are shown in the display.

See the following section for specific applications.

### (5)Instrument Switches and Displays



The indicator lights for these switches show if they are on or off or what the setting is.

Settings can all stored in memory. Up to 5 users can store their own individual array of settings in memory(see [5] 3. (7) 2) of this manual).

**⚠ WARNING**

!

**Always stop using an instrument before changing any settings.**

>>Changing settings while an instrument is actually in use could result in a serious accident.

#### 1)Instrument Selection

An instrument is recognized as having been selected and ready for use when it is taken out of its holder.

And it keeps its priority until it is put back again.

\*We do not have the function of selection display and priority selection for the three-way syringe.

#### 2) Display

The display shows various settings and information.

The following are the main functions:

>>**When all instruments are all put away**

Illustration A : Time and date display and display selection (see section[5]3.(7))

>>**When an instrument is selected**

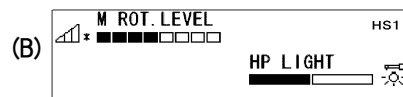
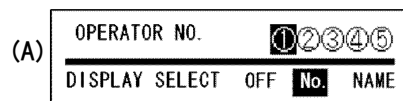
Illustration B : Shows instrument setting(see following section)

>>**Timer Display**

Illustration C :Countdown timer display(see following section(6))


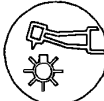


>>**Whenever Required**

Illustration D: Guidance or other messages



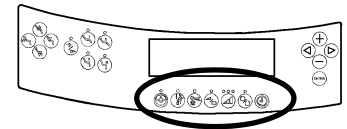
### 3) Instrument Switches and Displays

These switches work for which ever instrument has been picked up.  
Each press of the switch changes the setting. The lamp shows what the setting is. Refer to the chart below:

Switch	Lamp	Content
Spray 	Spray On: Green Spray Off: Amber	Turn spray on and off
Light** 	On: Green Off: Amber	Turn spray on and off
Speed Range*** 	Selected range lamp lights up UL/L                      M                      H amber/green                      green                      green 	Air Turbine Low / Medium / High
		Micromotor Ultra Low / Low / Medium / High

\*\* : Does not work if not equipped with light

\*\*\* : Differs somewhat depending on instrument

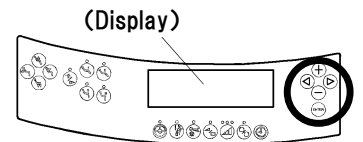


Instrument Switches

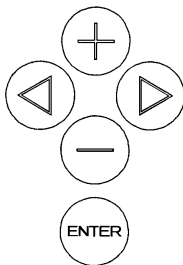
### 4)Using Set Switches

Pick up the instrument and look at the display.

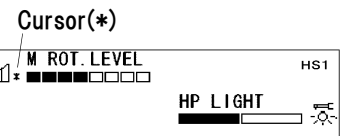
- Use the triangle switches to move the cursor (\* mark) and select the desired item.
- Use the plus and minus keys to make the setting. Refer to the chart below.
- Settings for each instrument will be stored in memory.



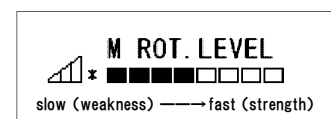
Set Switches

Set Switches	Selections
	<All Instruments> Hand piece Light
	<Air Turbine> Maximum Speed
	<Micromotor> Speed Range
	Tip air on or off for UL and L
	<Ultra Sonic Scaler> Maximum Power Level**

\*\* : Selections depend on model. Lights for three-way syringes do not have a brightness adjustment.



Display (for micromotor)

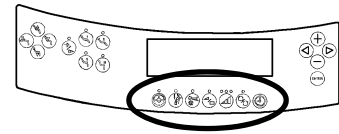



Various Settings (for micromotor)

### 5)Air Turbine and Micromotor Setting

Press the switch to change the setting.

The status of the lamp indicates the setting.





Switch	Lamp	Content
Rotation Mode 	Green: Variable Speed Amber: Constant Speed	Variable or Constant Speed**

\*\* : There are two rotation modes: variable and constant. Variable rotation means the speed depends on how far the pedal is depressed. Constant rotation means that the hand piece always rotates at maximum speed when the pedal is depressed.

### 6)Micromotor Switch

Press the switch to change the setting.

The status of the lamp indicates the setting.



Switch	Lamp	Content
Rotation Direction 	Green: Forward Amber: Reverse	Forward or Reverse Rotation
Speed Range 	Changes speed that appears in display	Standard ( 1 : 1 ) Faster ** Slower **

\*\* : Requires user to make setting. See [5] 3, (7) K of this manual.

### 7)Ultra Sonic Scaler \*

Press the switch to change the setting.

The status of the lamp indicates the setting.

Switch	Lamp	Content
Power Level** 	Green lamps for: Perio Endo Scaling 	Weak: Periodontal Medium: Endodontal Strong: Scaling

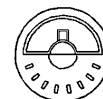
\*\* : Settings may differ depending on model.

### 8)Operating Light Switch\*

Press the switch to change the setting.

The status of the lamp indicates the setting.

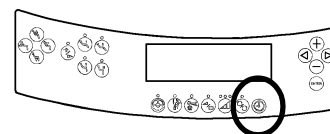
(For models with auto light.)



\*: Option



## (6)Timer Switch



Timer Switch

Press this to use the digital countdown timer. It can be set as high as 59 minutes and 59 seconds. Useful when taking impressions or giving an anesthetic.

### 1)Set

Use the Set Switches to set the time.

a)Press the Timer switch to bring up the Timer display.



Timer display

b)Use the cursor keys to select the digit to set.



c)Use the plus and minus keys to set the desired time.

Each press changes both minutes and seconds by 1.

Hold the key down to adjust seconds in 5-second increments.



Set Time



d)After entering the desired time, the time will be stored in memory.

Press Enter and hold down for 2 seconds, the desired time will return to 0 expressions.



Return to 0  
(Press Enter and hold down 2 seconds)

### 2)Use

a)Press the Timer switch to bring up the Timer display.



Timer Display

b)Press the Enter switch to start the countdown.

An alarm will start when the timer reaches zero. The alarm will continue for 30 seconds and then stop.

Press Enter to turn the alarm off.



Start and Stop

#### ADVICE

If you pick up an instrument while the timer is running, the display will change to the one for the instrument, but the timer will continue its countdown.

Pressing the Timer switch will make the display go back to the timer display.



Return to Timer Display

## (7)Setting Displays and User Settings

Put away all the dentist and assistant instruments so that the Main Display appears (Main Display). Then press the up and down cursor keys to view the various menus.

Press Enter to select a menu and then press the Left or Right cursor key to change the setting.

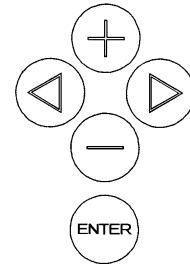
Finally press Enter again. All settings will be stored in memory.

**ADVICE**

To return to the Main Menu, pick up any instrument\*\*.

The Main Menu will appear when you put the instrument away.

\*\* : Except Three-way Syringes.



<Basic operation>

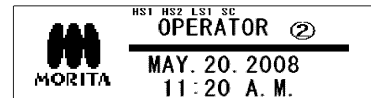
Select setting display with Up and Down keys and then press Enter.

Use the Left and Right keys to make settings then press Enter again.

### 1)Change Main Display

You can use any of the menus (refer to 2) )except the data display to described below as the Main Display. (Set date display before shipment)

Select the one you use most frequently. Simply select the desired menu and hold down the Enter Keys for 5 seconds, it becomes a sound and automatically make it returns it to the Main Display.



Date display

(Set to main display before shipment)



Change main display  
(Hold down the Enter keys for 5 seconds)

### 2)Date Display

This is the most basic display. (Set to Main Display before shipment)  
Date Display will indication (start screen) when Main Switch pumps in while Main Display changes (refer to 1).

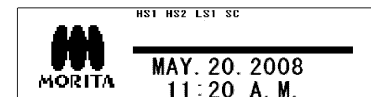
#### a) Date Display

The middle of the screen indicates the present date, the lower part of the screen indicates time.

**ADVICE**

The date and time can not be changed in this display.

Please refer to 9) [user setting] for information about making changes.



Date display

(not operator display)

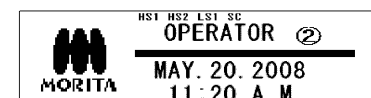
#### b) Operator Display

The upper row of the screen can indicate the operator number (refer to 3) )that has been chosen.

**ADVICE**

The operator can not make changes in this display.

Please refer to 3 [operator selection] for information about making changes.



Date display

(operator display)

**C)Hand piece display**

The display on the upper row will indicate the abbreviations of all the instruments on the dentist's tray.

- >>HS1 : Air turbine 1<sup>st</sup> circuit
- >>HS2 : Air turbine 2<sup>nd</sup> circuit\*
- >>LS1 : Micromotor 1<sup>st</sup> circuit
- >>LS2 : Micromotor 2<sup>nd</sup> circuit\*
- >>SC : Ultra Sonic Scaler\*
- >>VL : Light Lighting vessel\*

When the abbreviations of the instruments are highlighted, the fact that the circuit was inside the hand piece lock is shown.

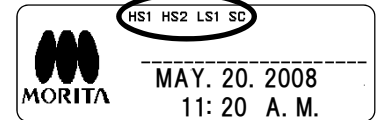
**ADVICE**

The hand piece lock can not be changed in this display.

Please refer to [hand piece lock] for information about making changes.

Hand piece display

HS1 HS2 LS1 SC



Air turbine 1st circuit  
Hand piece lock display

HS1 HS2 LS1 SC



**d) Chair Lock**

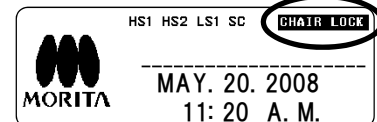
When the CHAIR LOCK being indicated by the right hand side of the upper row, the fact that it is inside the chair locking is shown.

**ADVICE**

The Chair Lock cannot be changed in this display. Please refer to [Chair lock] for information about making changes.

Chair Lock display

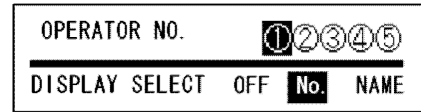
CHAIR LOCK



\*: Option

### 3)Operator Selection

This display enables Operator Number Selection (upper row) and Alteration of Operator Display Setting (lower).  
The fact is highlighted for the present status.



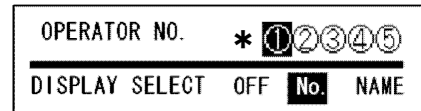
Operator selection display

#### a) Operator Number Selection

Five arrays of settings for both hand piece and user settings can be stored memory. These arrays are identified by Operator numbers 1 to 5. Changing the Operator number will change the array of settings in use. This is convenient if a single unit is being used by multiple doctors.

1:Select "Operator" and press Enter to change the input screen.  
The input screen will indicate the cursor keys (\*mark).

2:Press the up and down switches and remove the \*mark.



2: Removing the \* mark.

3:Press Enter when selecting the number by using the \* mark, then the screen will indicate the reverse display as a selected confirmation.



Press Enter to select this menu and again to set the operator number again

#### b) Operator Setting

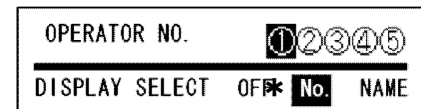
You have the optional choice of selecting the Off, Number Display and Name Display from the upper row of the Operator display (refer to 2)) upper row then Date Display.

**ADVICE**

The name display cannot be input into this display. Please refer to 9) [User Setting] for information about registration and Alteration.

1:Select "Operator" and press Enter to change the input screen.  
On the input screen will indicate the cursor keys (\*mark).

2: Press the up and down switches and remove the \*mark.



2: Removing the \* mark.

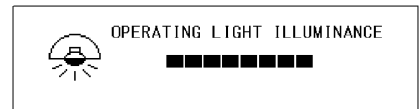
3:Press Enter when selecting the number by using \* mark, then the screen will indicate the reverse display as a selected confirmation.



Press Enter to select this menu and again to set the operator number

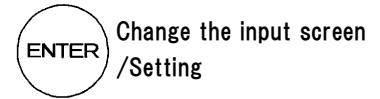
#### 4)Operating Light Brightness

The operating light has eight brightness levels (When equipped with auto light.)

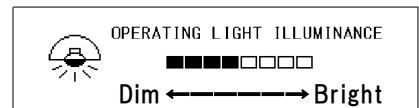


a)Bring up the display for the Operating Light and press Enter to change the input screen.

The input screen will indicate the cursor keys (\*mark).

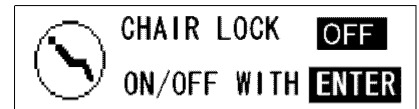


b)Press Enter to get confirm after using the up and down switches to set the brightness level.



#### 5)Chair Lock

This locks the chair in place. Use this if the chair should not be moved or when you will leave the room for a while.



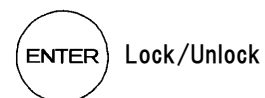
a)Go to the Chair Lock display and press Enter to lock the chair in place. The word "Lock" will appear on the display.

**ADVICE**

Status of Chair Lock also can be confirmed from the Date Display. (Refer to 2)[Date Display] )



b)To unlock the chair, press Enter again and the word "Off" will appear on the display.



### 6)Hand piece Lock

This will disable the selected dentist's instrument.

Use this if an instrument has been disconnected.

The locked instrument cannot be used and will not respond if it is picked up.

Each circuit will be indicated by an abbreviate. (Refer to 2)[Date display])

a)Display the Hand piece lock Menu and press Enter. The input screen will indicate the cursor key (\* mark).

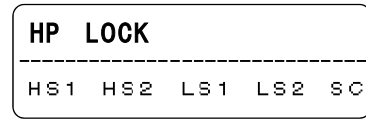
b)Use the Right and Left cursor keys to make the selection, then press Enter to lock in as a negative image.

**ADVICE** Status of Hand piece lock also can get the confirmation from Date Display. (Refer to 2) [Date Display])

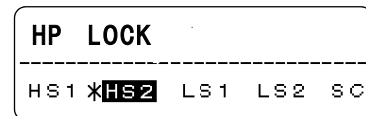
c)Repeat step b) above to lock or unlock another hand piece.

**ADVICE** Hold down the Enter key for 2 seconds when you need to cancel the input screen and return to the Main display.

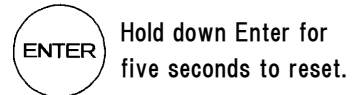
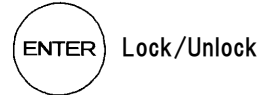
d)Press Enter and Repeat steps a) and b) above to unlock. The display will change to a negative image to show the instrument was unlocked.



Hand piece lock display



Negative image = Lock



### 7)Initial Reset

This will cancel any changes made and restore the original settings stored memory(Refer to 9) [User Setting]. This makes it easy to cancel multiple new settings simultaneously.

**ADVICE** Settings can be stored in memory for each individual operator number. Original settings stored in memory are restored only for the operator number currently in use. To change settings for other operator, select each of those numbers in turn. (Refer to 3) [Operator Selection])

a)Display the Initial Reset Menu and press Enter. The message on the lower part of the screen will change on the input screen.

b)Press Enter and hold down for 2 seconds to begin resetting of the instrument.

**ADVICE** It is not possible to undo the reset procedure and return back to the settings that have been canceled.



Initial reset display



Initial reset display (Input)



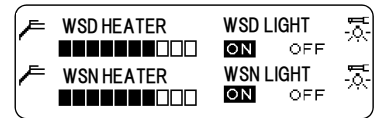
### 8)Three-way Syringe Setting\*

Set display for Three-way Syringe (WS) Heater with tube or with light specification.(This option will not indicate when on un-plant)

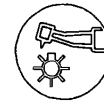
D for Dentist side, N for Assistant's side as indicated.

**ADVICE**

This display indicates that the Light Changing Switch could respond at any time while the entire instrument was being put inside the holder.  
(This option will not respond when on un-plant)



Three-way syringe setting display



Set display respond

#### a)Heater Temperature Setting

Heater with Tube can set up the temperature.

(Each has 8 levels for Dentist's side and assistant's side)

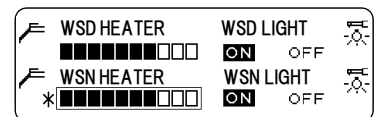
1:Press Enter to make changes to the Three-way Syringe option setting display.

The input screen will indicate the cursor key (\* mark).



Press Enter to make changes to the Three-way Syringe option setting display

2:Use the Up and Down switch to select the instrument, and use the right and left side switch to carry out the adjustment.



Low <--> High

3:Press Enter to return to the manual selection screen.

#### b) Three-way Syringe Light On/Off Setting

Three-way Syringe with light can set up On/Off switch.

1:Press Enter to make changes to the Three-way Syringe option setting display.

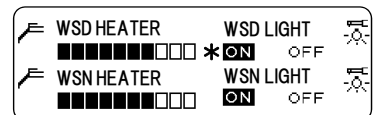
On the input screen will indicate the cursor key (\* mark).



Press Enter to make changes to the Three-way Syringe option setting display

2:Use the Up and Down switch to select the instrument, and use right left side switch to select the ON or OFF.

Instrument been selected will change to negative image.



3:Press Enter to return to the manual selection.

\*: Option

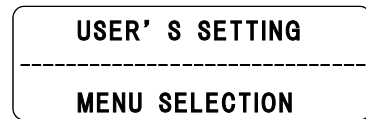
### 9)User Settings

There are various other settings that can be made.

Press Enter Start Display in the screen at the right hand side to return to the User Settings Menu.

If the unit is not equipped with one of the functions, the display for that function will be disabled.

**ADVICE** Press Cancel (Refer to 7 top) or [refer to User Setting Closing] if you need to return from the User Settings Menu to the Normal Menu.



User Setting display

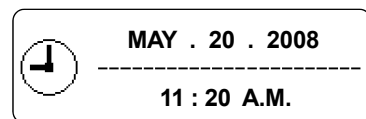


#### A)Date Display

Modifications on the Date Display (Refer to 2)).

Use the Right and Left keys to match the settings, then press Enter. Then use the Up and Down keys to select one of the possible listed settings, then press Enter.

**CHECK** Errors will occur on the Date Display. Please carry out accurate confirmation and then modify it.



Date Display (input)

#### B)Tank Cleaning Option

If the option is turned on, the vacuum tank will be automatically cleaned after the chair's reset switch has been pressed ON or OFF (Refer to [5]7.1) and the chair is returned to the treatment position.

(If it is not equipped with the selected mechanism or function, the display is disabled.)

Press Enter to return to the display screen, and use the Right and Left keys to match the selection. Press Enter again to confirm.



Tank cleaning option display(input)

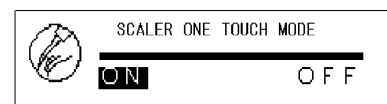
#### C)Scaler in Continuance Mode

When this is turned on, the scaler is turned on by stepping on the pedal and runs continuously. It is turned off by stepping on the pedal again. (I.e., the pedal does not have to be held down all the time while the scaler is running.)

When it is turned off, the scaler only runs while the pedal is depressed.

(If it is not equipped with the selected mechanism or function, the display is disabled.)

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



Scaler in Continuance Mode display (input)



**D)Operating Light Auto On and Off, Option 1**

When this is enabled, the operating light turns on when an instrument on the dentist's side instrument is picked up and it can be choose for the interlock On or Off.

When the interlock been setting, either instrument\*\* were picked up and operating light turn on. (If it is not equipped with the selected mechanism or function, the auto light function is disabled.)

\*\*.: except the Three-way Syringe.

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



Operating Light Auto On and Off, option1 (input)

**E)Operating Light Auto On and Off, Option 2**

When this is enabled, the Auto Chair will turn on and interlock On or Off can be chosen.

When the interlock has been set the Operating Light, which had been matched by the Auto Action (set 1 or set 2) process, will turns on. (If it is not equipped with the selected mechanism or function, the auto light function will be disabled.)

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.

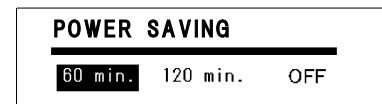


Operating Light Auto On and Off, option2 (input)

**F)Power Save**

Select either 60, 120 minutes or OFF. (Refer to [5]1(2))

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



Power Save (input)

**G) LS Spray Timing**

There are two possible settings for the micromotor (Low Speed :LS ).

>>Immediate: As soon as the pedal is pressed.

>>Delayed: After the pedal is pressed down far enough. Each mode is available for possible setting.

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



LS Splay Timing for Variable speed (input)



LS Splay Timing for Constant speed (input)

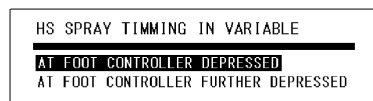
**H) HS Spray Timing**

There are two possible settings for Air turbine (High Speed :HS).

>>Immediate: As soon as the pedal is pressed.

>>Delayed: After the pedal is pressed down far enough. Each mode is available for possible setting.

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



HS Splay Timing for Variable speed (input)



HS Splay Timing for Constant speed (input)

**I) (OPTIONAL MODE)**

\*: Option

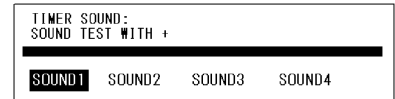
J) (OPTIONAL MODE)

K) Timer Sound Setting

The timer sound (refer to [5]3.6) has 4 kinds of different sounds. Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.

**ADVICE**

Select one of them with the cursor keys and then press the plus key to run a sound test. Press the minus key to turn the sound off.



Timer Sound display (input)



Sound Test



Sound Off

L) LS Attachment Gear Setting

Due to the connection, you need to input the attachment gear before hand on the display screen base on the micromotor (LS) low/high rotation attachment.

Below is the low/high gear settings number.

>>High gear: 1.0~5.9

>>Low gear: 1.0~1024

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm. Please base on the same input as LS2 to set up the micromotor no.2 circuit.

**CHECK**

High/Low gear attachment rotation display is based on the standard amount that has been added by the input setting number. It never accorded with the fact rotation amount.

Please take the confirmation from the Attachment Specification.



LS1 High gear setting (input)



LS1 Low gear setting (input)



LS2 High gear setting (input)



LS2 Low gear setting (input)

**M)Chair Auto-positioning Patterns**

There are 3 auto-positioning patterns:

1:RISING &RECLINING AT ONCE

Seat and Back rest Start Simultaneously. This takes the least amount of time but is more stressful for the patient.

2:RECLINING AFTER RISING STARTS

Back rest Starts 1 Second After Seat. This takes a little longer but is less stressful. (Recommended)

3:RECLINING AFTER RISING FINISHES

Back rest Starts After Seat Stops.  
This takes the longest amount of but is the least stressful.

Press Enter to return to the display screen, use the Right and Left keys to match the selection, and press Enter again to confirm.



Chair Auto-positioning Patterns (input)

**N)Initial Memory**

Please feel free to register the Initial Memory.

It is possible to return initial to reset even if various setting changes have been carried out when registering here. (refer to [7])

Please go to Operator number to register.



It is impossible to recall back the setting before after the new register confirm.

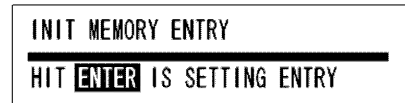
Please take confirmation for the settings subject and Operator numbers before taking action to register it.

1:Selected the Operator number.

2:Press Enter on the Initial Memory display screen.

The below message will change.

3:Press Enter and hold down for 5 second, then the selected subject will register.



Initial Memory

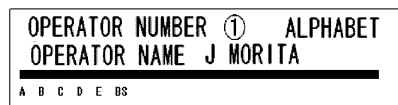


Initial Memory (input)

**O)Operator Name Setting**

It is possible to change any name is possible to change in the Operator Number Display. (refer to 3))

Follow the on-screen instructions and input the Operator Names.



Operator Name Setting

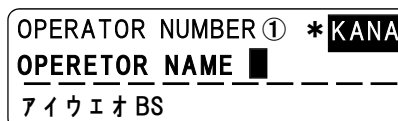
1:Key in the name on the Operator display.

2:Press Enter on it to re-confirm the name.

Input screen will indicate the cursor keys (\* mark).

3:Word can be change also as Katakana and Alphabet.

Match the Up and Down switch with \*mark, then use the Right and Left switches to change the display.

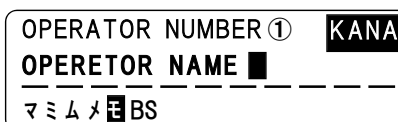


3: Katakana and Alphabet characters can also be used.

4:Key in the word.

Match the Up and Down switch with \*mark, then use the Right and Left switches move to word line.

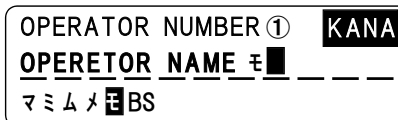
Key in the word and Press Enter, then the word will be indicated in the middle of the display.



4: Key in the word.

**ADVICE**

[BS] on the right hand side show for Backspace. If you need to delete a word, please Press Enter while matching to the word.

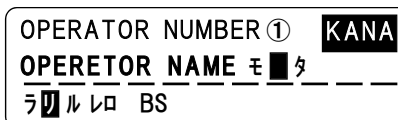


4: Press Enter

(Indicate on the middle of the display)

5:To correct the word, please move to the middle side again.

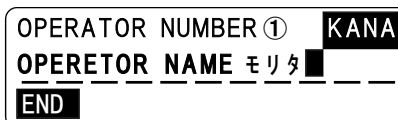
Match the Up and Down switch with \* mark, then use the Right and Left switches to match the word and carry out 4:.



5: Correct the word

6:After entering the value or canceling please choose [END].

Match the Up and Down switch with \* mark, use the Left and Right switches move to word line and press Enter while matching the [END].



6: After entering the value or canceling

**P) Bacteria Filter Replacement**

Used this to record Bacteria Filter Replacement.

Be sure to record the replacement dates of bacteria filters.

It is used for Air and water as well.

1:Press Enter to change the input screen.

It is also possible to show exchange date on the Input screen.

2:Press Enter and hold down for 5 seconds, date will renew again.

**ADVICE**

After renewal, you will not be able to bring back the data that existed prior to the renewal.

Please be careful when carrying out renewal.

**Q) Completion of User Settings**

After completing the User Setting, please press Enter to return back to the main manual.

It will moves to the date display.

BACTERIA SCREENING FILTER  
FOR AIR

REPLACED      MAY. 20.2008

**Bacteria Filter Replacement  
used for Air**

BACTERIA SCREENING FILTER  
FOR WATER

REPLACED      MAY. 20.2008

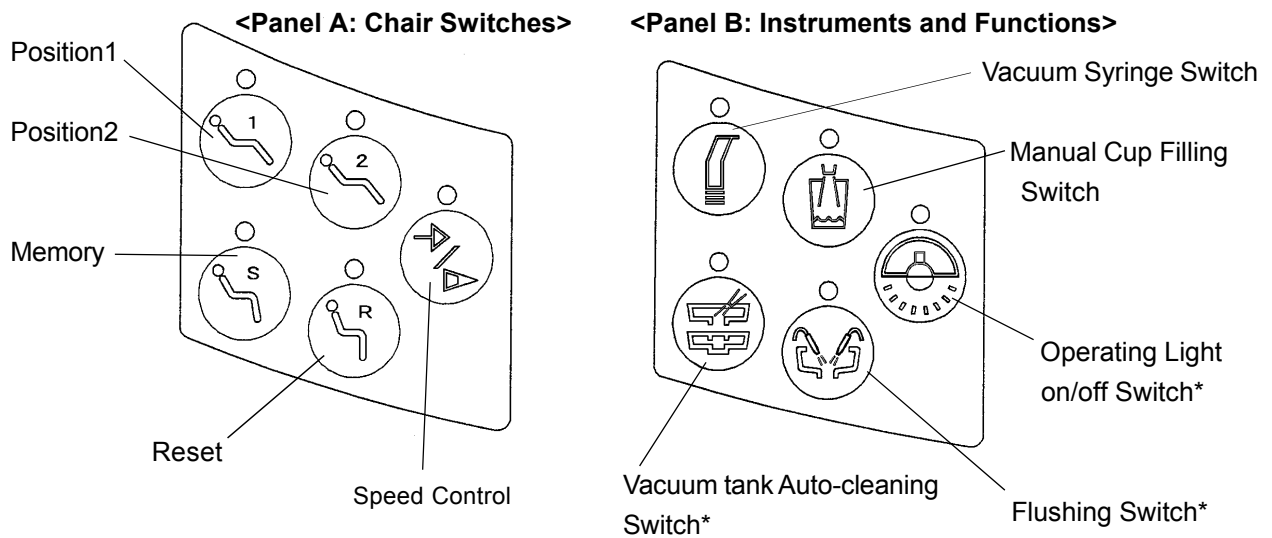
**Bacteria Filter Replacement  
used for Water**

RETURN MENU

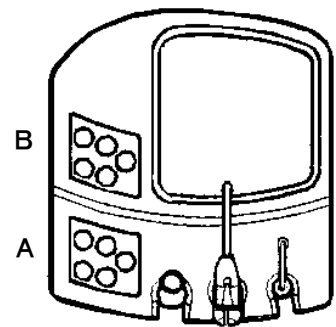
HIT ENTER

Completion of User Settings

## 4. Assistants Switch Panel



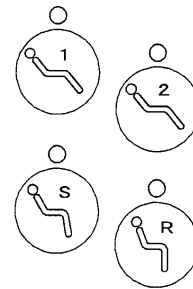
There are two switch panels, A and B, on the Assistants side.



### (1) Auto-positioning Switches <Panel A>

These are used in the same way as those on the dentist's side.  
Refer to section [5] 3. (1) of this manual.

- 1) **Position 1 and position 2.**
- 2) **Reset**
- 3) **Memory**



Positions cannot be set using the switches on the assistant's side.

### (2) Speed Control <Panel A>

Use this switch to control the speed of the chair's movement.  
Refer to section [5] 3. (1) of this manual.



\*: Option

**(3)Manual Cup Filling Switch** <Panel B>

Press this to fill cups manually.

Water flows only while this switch is being held down.

**CHECK**

If all the instruments have been put away, the Spray switch on the dentist's side can be used in the same way.

**ADVICE**

Check that a cup is in place. Otherwise, water may spill and splash around the area.

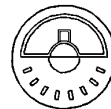


(Dentist's side)

**(4)Operating Light ON/OFF Switch\*** <Panel B>

Press this switch to turn the light on and off.

For details, refer to [5] 3. (5) of this manual.



**(5)Flushing Switch\*** <Panel B>

This only works if the unit is equipped with a flushing device.\*\*

Press this switch to flush the water inside the unit out through the main tubes.

For details, refer to [5] 7. (1) 3) of this manual.



**(6)Vacuum Tank Auto-cleaning Switch** <Panel B>

This only works if the unit has this function.\*\*

Press this switch to automatically clean the vacuum tank.

For details, refer to [5] 7. (1) 4) of this manual.



**(7)Vacuum Syringe Switch** <Panel B>

Use this switch to turn the vacuum syringe on and off after it has been taken out of its holder. Use it to temporarily turn the syringe off.

**ADVICE**

If the syringe is put away when it has been turned off using this switch, it will turn on normally when it is taken out again.





\*\* : Not functional if the unit is not equipped with the specified function.



## 5. Instrument Holders

 **CAUTION**

	<p><b>Before moving the seat or back rest, ensure the instrument holder has been clear and will not be hit by them.</b></p> <p>&gt;&gt;Otherwise, the equipment could be seriously damaged.</p> <p>To adjust the holder's position, grip the holder or its arm firmly and turn it slowly and carefully.</p>
	<p><b>When adjusting the position or angle of an instrument holder, grip the holder or its arm firmly and move it carefully.</b></p> <p>&gt;&gt;Do not grip the instrument section or use excessive force; this could seriously damage the holder.</p>
	<p><b>Never place a load greater than 10 N (1 kgf) on the assistant's auxiliary tray.</b></p> <p>&gt;&gt;This could seriously damage it.</p>
	<p><b>When the main tubes are connected, do not twist, bend pull or push them with excessive force.</b></p> <p>&gt;&gt;This could result in air or water leakage as well as serious damage.</p>
	<p><b>The act of putting a strain is not allowed for Main tubes.</b> (When the table draws it or strongly pulls while cleaning.)</p> <p>&gt;&gt;This could result in air or water leakage as well as serious damage.</p>

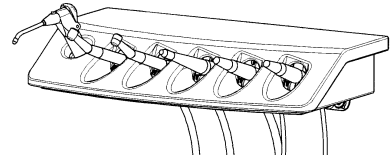
## (1)Dentists 6 Instrument Holder

### ⚠ CAUTION



**Never use force to disconnect or take apart the main tubes, roller block or top cover.**

>>If the holder is not taken apart in the correct way, it could be seriously damaged.



### 1)Moving the Holder

The holder arm may be moved horizontally. Firmly grip both sides of the holder and carefully move it into the desired position.

### 2)Top Cover Removal

The holder's top cover can be removed for easy cleaning and disinfecting.

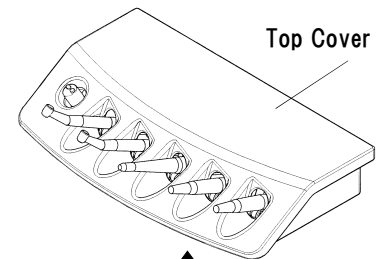
There are three fasteners inside the cover that hold it on.

#### ADVICE

Take the three-way syringe off its tube before removing the cover.

a)Press down on the front edge of the cover to release the fastener.

b)Lift the cover up to release the fasteners on the back.



Push in Lift Up ↑

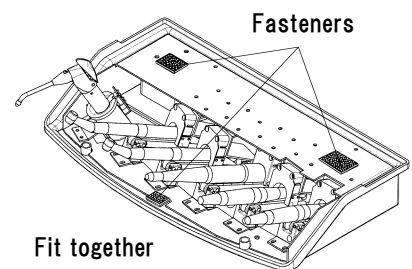
### 3)Top Cover Attachment

#### ADVICE

Ensure there is an audible click when the fasteners go into place. Otherwise, the top will not be held on securely.

a)Put the cover on the holder and press down on the left and right sides of the back to secure those fasteners.

b)Press the back of the front edge of the cover down onto the holder to secure the fastener in front.

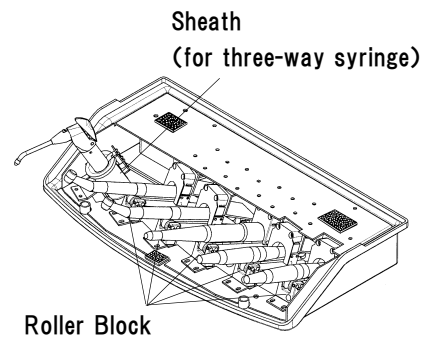


Fit together until an audible click is heard.

#### 4)Main Tube Disconnection

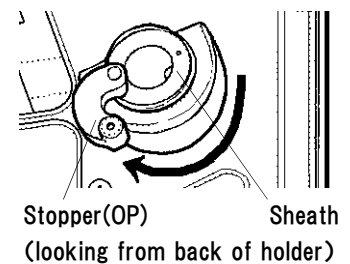
The main tubes pass through the roller blocks inside the holder, except for tube for the three-way syringe that is held by a sheath. The tubes can be disconnected in the following way.

- a)Take all the instruments off their tubes.
- b)Pull the tubes out of the back of the holder by manipulating the roller block.



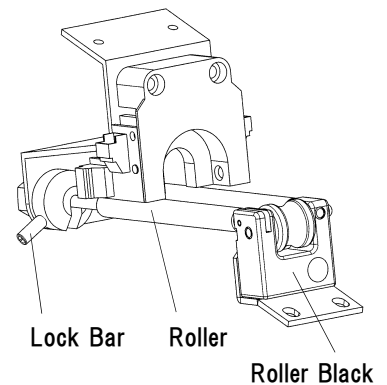
#### <Three-way Syringe>

Open the stopper on the back of the sheath and pull the tube down.



#### <Other Instruments>

There is a lock bar on the lower left of the back of the roller block; rotate it to the left. This will release the roller and allow you to pull the tube out.

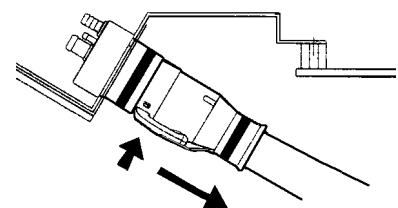


- c)Disconnect the other end of each tube from the tray. Hold down the lock button on the connector and pull it straight off.

**ADVICE**

It is easier to get the connector off if it is tilted down slightly.

It will be difficult to do so if it is tilted up.



Hold lock button down, and pull tube straight out

- d)Pull the tube out of the tube lifter ring.

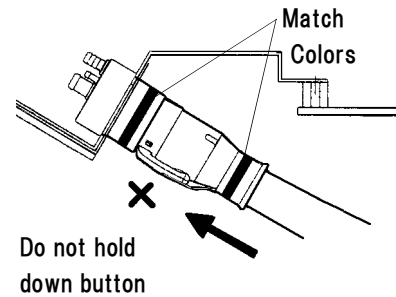
### 5)Main Tube Attachment

Reattach the tubes in the following way.

a)Connect the tube to the tray.

Match the color on the tube connector with its mate on the tray.  
Hold the tube connector with the lock button facing down, line it up and push it on.

**ADVICE** Push the connector on without holding down the lock button. Ensure there is an audible click.



b)Pass the tubes through the ring on the tube lifter.

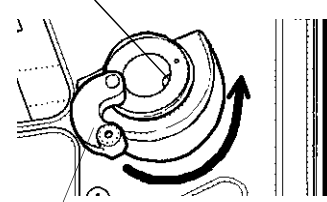
**CHECK** Do not mix up the order. Check it before passing the tubes through the ring.

c)Pass the tube for the three-way syringe through its sheath.

Hold down the actuator (projection) inside the sheath, route the tube up through the sheath, and close the stopper.

**CHECK** Ensure there is an audible click and that the stopper goes all the way into place.

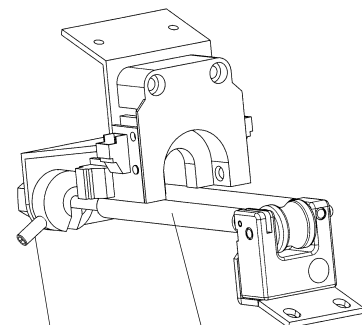
Hold down actuator



Put stopper back in place  
(looking from back of holder)

d)Pass all the other tubes between the rollers. After routing the tubes through their rollers, line up the free roller with the groove in the roller block and put it back in its original position.

Then rotate the lock bar all the way to the right.



Push in free roller after routing tubes

Secure roller with lock bar

e)Route the tubes up to the top of the holder and connect their instruments.

### 6)Roller Block Removal

The roller blocks can be removed for easy cleaning and disinfecting.

Refer to sections 2) and 4) above.

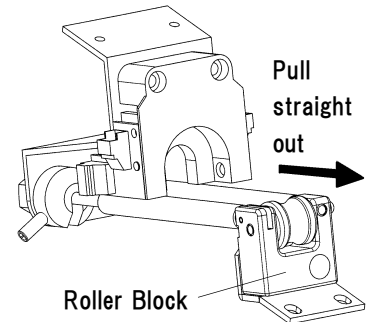
The sheath for the three-way syringe cannot be removed.

- a)Take off the top cover (section 2) above).
- b)Take off the main tubes (section 4) above).
- c)Take off the roller block.

**ADVICE**

Pulling directly on the roller could cause serious damage.

Hold onto the Write part of the roller block and pull in straight out.



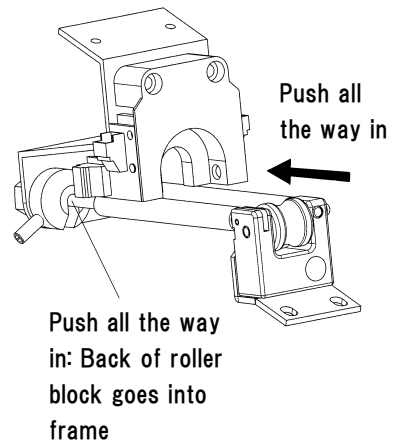
### 7)Reattach Roller Blocks

Refer to section 5) above and put the roller blocks back in the following way.

**CHECK**

Each roller block is for a certain tube. Do not mix them up.

- a)Put each of the roller blocks back in place.  
Fit the backs of the roller blocks into the holder frame (the part with the lock bar).  
Hold the white part of the roller block and push it all the way onto the pin on the attachment bracket.



- b)Replace the tubes as described in section 5) above.
- c)Replace the top cover as described in section 3)above.

## (2) Assistants Holder

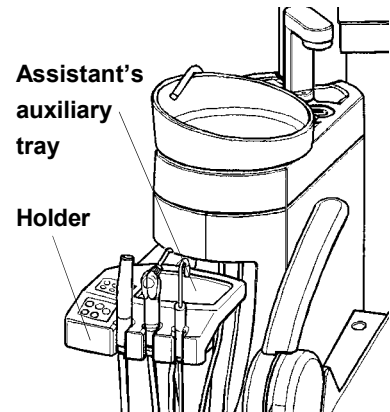
### ⚠ CAUTION



Never place a load greater than 9.8 N (1 kgf) on the assistant's auxiliary tray.

>>This could seriously damage it.

The holder rotates horizontally and its arm swivels horizontally to the outside. Also the arm moves in and out. Set the holder in the most convenient position. To adjust the position of the holder and its arm, grip both sides of the holder firmly and move it carefully.



### 1) Assistant's Auxiliary Tray

An auxiliary tray is built into the holder.

### 2) Main Tube Disconnection

These tubes are easily disconnected.

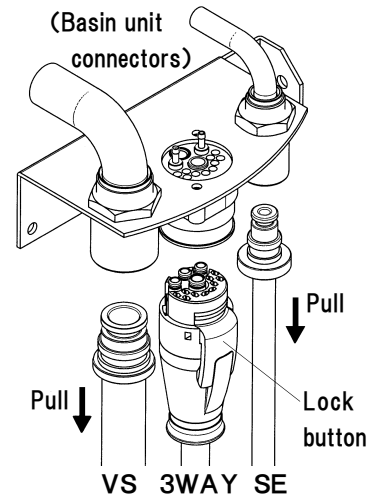
a) Disconnect the tubes from the basin unit.

#### <Three-way Syringe>

Hold down the lock button and pull the tube straight off.

#### <Vacuum Syringe and Saliva Ejector>

Grip the connector firmly and pull the tube straight off.



### 3) Main Tube attachment

a) Plug each tube into its connector on the basin unit.

#### <Three-way Syringe>

Line the connector up with its mate and push it straight on.

#### CHECK

Match the colors of the tube and basin unit connectors.

#### ADVICE





Do not hold down the lock button and push the connector in until an audible click is heard.

#### <Vacuum Syringe and Saliva Ejector>

Grip the connector firmly and push it straight all the way into its mate on the basin unit.

## 6. Instruments

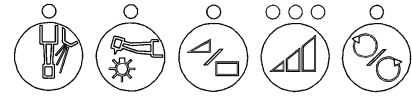
### WARNING

	<p><b>Refer to the individual operator's manuals for the air turbine hand pieces, micromotor, ultrasonic scaler and other similar instruments for details and instructions on how to connect and operate these instruments.</b></p> <p>&gt;&gt;Incorrect operation and handling of these instruments could result in an accident resulting in injury or damage to the instrument.</p>
	<p><b>Return instruments to their holders carefully and ensure they are correctly secured.</b></p> <p>&gt;&gt;If an instrument is not correctly secured in its holder, there could be some confusion about which instrument is presently selected for use. This could result in an accidental injury or damage to equipment.</p>
	<p><b>If the main tube for the air turbine swells up during use, stop using it immediately and check the air exhaust line.</b></p> <p>&gt;&gt;If the main tube's air exhaust line is pinched or plugged up, the tube could swell up and burst resulting in an accident or damage to equipment .</p>
	<p><b>Never pinch or excessively bend the main tubes, especially the air turbine tube when it is running.</b></p> <p>&gt;&gt;Using an instrument when the main tube is pinched could block the air and exhaust line and cause the tube to swell up and burst resulting in an accident or damage to equipment .</p>
<h3> CAUTION</h3>	
	<p><b>Please take notice when the jets of air from each instrument apply to gums. Proceed as soon as possible if any abnormal cases should occur.</b></p> <p>&gt;&gt;When air is used for gums, the syndrome of happening by accident such as the subcutaneous emphysemas might be caused.</p>

Instrument Selection and Settings:

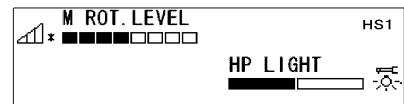
>> **Instrument Selection Switches**

Frequently used during treatment. Press the switch for the instrument that has been picked up.  
The selected instrument is identified by the LED above its switch.  
(Refer to [5] 3. (5) 5) to 7) of this manual.)



>> **Setting Switches**

Use low frequency before treatment. Switch settings apply to the instrument that has been picked up. Settings are shown in the display.  
(Refer to [5] 3. (5) 4) of this manual.)



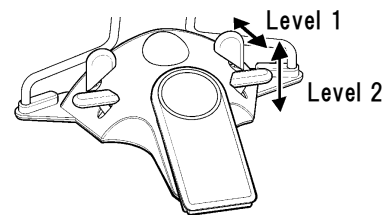
>> **User Settings**

Used for adjustments before beginning treatment.  
Use Set Switches to check and make adjustments on the various displays. (Refer to [5] 3. (7) 9) of this manual.)



>> **Extended Function Levers \***

These foot control levers can be used instead of some or the most frequently used switches. They apply to whichever instrument is selected for use (picked up).  
Settings are shown by the LED for the corresponding switch on the switch panel. (Refer to [5] 2.(3) 2) of this manual.)



>> **Flow Adjustment Knobs**

Use these to adjust the air and water flow for each of the instruments.  
(Refer to section (9) below.)

\*: Option



## (1)Air Turbine Hand piece

### 1)Operation

Take the handpiece out of its holder and step on the foot pedal to operate it.

It rotates at a constant speed. If the turbine is the optional variable speed type, the range settings will determine its speed.

The chart to the right shows the speed ranges.(Refer to 2) below for maximum speed setting.)

If a variable speed turbine is set for constant speed, it will run at the maximum speed shown in the chart.

**ADVICE**

The chart to the right shows the variation in the air pressure. This is not necessarily the same as the speed.

Air Turbine Speed Estimates	
Range	Setting*1
Low	25 % to 50%
Medium	25 % to 75%
High	25 % to 100%

\*1:Factory settings

### 2)Setting

Various settings for air turbine hand pieces:

>>**Instrument Set Switches** (See [5] 3. (5) 3) and 5) of this manual.)

- (A)Spray On and Off
- (B)Hand piece Light On and Off
- (C)Variable or Constant Speed
- (D)Speed Ranges (low, medium,high)

>>**Set Switches** (See [5] 3. (5) 4) of this manual.)

- (E)Set maximum speed for each,v speed range
- (F)Hand piece Light Brightness (2 levels)

>>**User Settings** (See [5] 3. (7) 7) of this manual.)

- (G)Hand piece Spray Timing  
(When pedal is first stepped on or later when it is depressed farther)

### 3)Clean System

This prevents the vacuum effect when the hand piece stops running and thereby prevents contamination being sucked into the system.

When the turbine stops,the IN side is closed and a little air flows out of the OUT side for about 7 seconds.

## (2)Air Scaler\*

An air scaler can be connected to the air turbine system.

It will then operate in the same way as an air turbine.

Refer to number (1) above.

### (3)Micromotor

#### 1)Operation

Take the micromotor out of its holder and step on the foot pedal to operate it. The display shows its approximate speed.

The chart to the right shows the speeds for variable speed mode(see 2)below). The maximum speeds can be lowered.(see 2) below for how to set the maximum speed.)

If a variable micromotor is set for constant speed, it will run at the maximum speed shown in the chart.

Tip air can be turned on or off for each speed range.

**ADVICE** The motor could overheat if the tip air is turned off for the medium and high speed ranges. Normally please use the tip air after ON.

Micromotor Speed Estimates *1		
Setting	Range (Min <sup>-1</sup> ) *2	
Ultra Low	100 to 250	*3
Low	100 to 3,000	*3
Medium	100 to 9,000	
High	100 to 40,000	

\*1 for TR-91

\*2: factory setting

\*3: Tip Air Off(factory setting)

#### 2)Settings

Micromotor settings are shown below:

>>**Instrument Set Switches** (See [5] 3. (5) 3),5) and6)of this manual.)

- (A) Spray On and Off
- (B) Hand piece Light On and Off \*
- (C) Variable or Constant Speed
- (D) Speed Ranges (ultra low, low, medium, high)
- (E) Rotation Direction (forwards or reverse)

>>**Set Switches** (See [5] 3. (5) of this manual.)

- (F) Set maximum speed for each speed range
- (G) Hand piece Light Brightness\* (2 levels)
- (H) Tip Air On or Off

>>**User Setting** (See [5] 3. (7) 7) of this manual.)

- ( I ) Spray Timing  
(When pedal is first stepped on or later when it is depressed farther )

\*: Option

### 3)Micromotor Overload Protection Circuit

#### CAUTION



**Never press down with steady and excessive force or intentionally cause the motor to stop by overloading it.**

>>Repeated or frequent triggering of the micromotor's overload protection circuit will Cause it to overheat and result in damaging the motor.

A sudden and excessive increase in the load on the micromotor will trigger the overload protection circuit, and the motor will temporarily stop running.

This is to prevent overheating of the motor and the circuit board.

Wait until the overload or overheating is relieved, and then presses the pedal again to restart the motor.

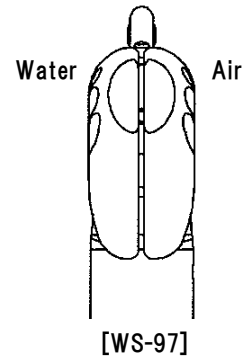
**(4)Three-way Syringe**

<b>⚠ WARNING</b>	
<b>!</b>	<p><b>Always check the temperature settings for water warmers, if the unit is equipped with them.</b></p> <p>&gt;&gt;If the heaters are set too high, the patient could be burned or the equipment could be damage.</p>
<b>⚠ CAUTION</b>	
<b>!</b>	<p><b>During hot weather,turn the heater off.</b></p> <p>&gt;&gt;Otherwise,over heating could shorten the working life of the main tube and the heater.</p>

**1)Operation**

This syringe can emit air or water or spray.  
 Press the right lever for air.  
 Press the left lever for water.  
 Press both levers at the same time for a misty spray.

Both leavers Simultaneously : Spray



If necessary, both air and water can be warmed. See 3) and 4) below.

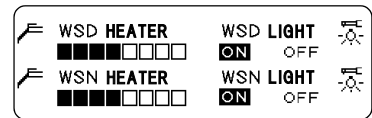
**2)Settings**

The following setting can be made:

>>**Display Selections** (See[5]3.(7) 8) of this manual)

(A)Hand piece Light On and Off\*\*  
 <both dentist's and assistant's>

(B)Warmer Temperature (from off to maximum,7 levels)\*  
 <both dentist's and assistant's>



Three-way syringe setting display

\*\* : The light for three-way syringes does not have a brightness adjustment.

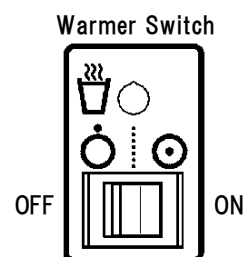
### 3)Warm Water

The water can be warmed if necessary.



The warmer switch is on the basin unit's switch panel.

This will warm the water for both the cup and the three-way syringe.

(See [5] 7. (2) of this manual.)



### 4)Heat insulation\*

 <b>CAUTION</b>	
	<p><b>During hot weather, turn the heater off.</b></p> <p>&gt;&gt;Otherwise, over heating could shorten the working life of the main tube and the heater.</p>

If the three-way syringe tube is equipped with a heater, the air it emits can be warmed.

#### <Adjustment for Temperature>

Go to User setting WS option setting display.

(See [5]3(7) of this manual.)

Go to the circuit of Doctors and Assistant side.

#### **CHECK**

How warm the heater gets depends on the room temperature and how frequently it is used. Ensure it is correctly adjusted and does not overheat.

\*: Option

**(5)WS-97 Three-way Syringe <Snap-on Connection>**

For operation and settings, see (4) above.

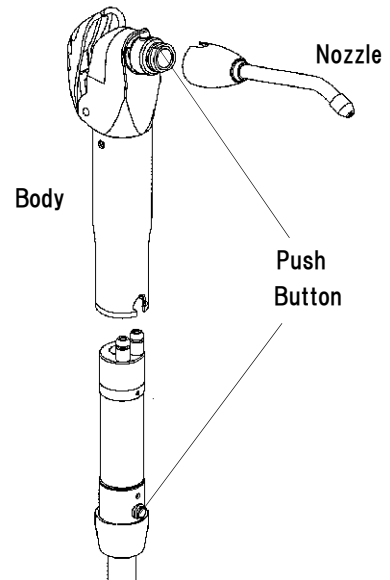
**1)Remove Nozzle and Body**

Both the nozzle and body can be autoclaved and are removable.  
Hold down the push button for the body or nozzle and pull it straight out.

To reattach it, push it straight in until it clicks into place.

**2)Nozzle and Body Attachment**

To reattach either of these, hold down the push button push it straight in until it clicks into place.



**(6)Vacuum Syringe VS-90QT** <Detachable body>

 <b>CAUTION</b>	
	<p><b>Rotate the body to take it off. Do not twist the tube.</b> &gt;&gt;Otherwise, the instrument could be damaged.</p>

**1)Operation**

This syringe begins to operate when it is taken off its holder on the assistant's side and stops when it is returned to its holder.

(The timing for stopping can be set; see 2) below)

When the syringe has been pulled out, it can be turned off and on with the vacuum switch.(See[5]4.(7)of this manual)



Vacuum Switch

**ADVICE**

The syringe will not operate if it is pulled out while the auto cup filler is operating.

**2)Settings**

Settings are shown below:

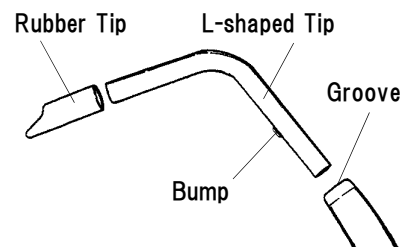
>>**Display Settings** (See[5]3.(7) 7) of this manual.)

(A)Timing to stop suction (immediate or delayed).

**3)L-shaped Tip\***

a)Put the rubber tip onto the L-shaped Tip.

b)Line up the bump on the tip with the groove inside the body and slide it in.



**4)Syringe Body Removal**

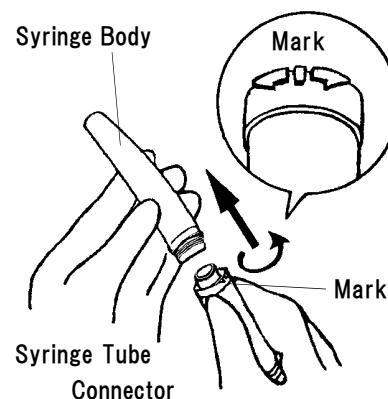
The end of the syringe body is autoclave and can be removed.

Hold the main part of the syringe at the bottom and unscrew the body.

To adjust the angle of the syringe, loosen the tube connector and pull it down. Then adjust the angle (the mark on the connector shows the left position).

Raise the connector back up and retighten it.

To reattach the body, screw it back on as far as it will go.



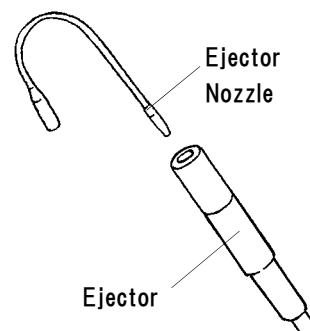
## (7)Saliva Ejector SE-90QT

### 1)Operation

The saliva ejector begins to operate when it is taken off its holder on the assistant's side and stops when it is returned to its holder.

**ADVICE**

The ejector will not operate if it is pulled out while the auto cup filler is operating.



### 2)Nozzle Connection

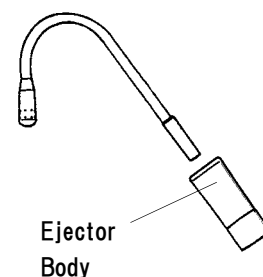
Slide the SE nozzle straight into the rubber end of the ejector until it is held firmly in place.

### 3)Body Detachment

The body can be taken off for autoclaving.

Click the metal part and pull in straight off.

To reattach it, pull it straight on until an audible click is heard..



## (8)Ultrasonic Scaler \*

### 1)Operation

Step on the foot pedal to operate the scaler. It vibrates at a steady rate.

When the spray is turned on, it will be emitted when the foot pedal is depressed.

There are 10 power levels for each power range. The upper limit for each range can be set. (See 2) below.)

The vibration level is shown in the display. (Refer to level estimate.)

If the scaler is set for continuo vibration, stepping on the pedal will start it, and stepping on the pedal again will stop it.(See 2) below.)

Power Level Estimates	
Setting	Power Range
Weak (periodontal):	Weakest 0 to medium 10
Medium (Endodontic):	Weak 0 to medium 10
Strong (scaling):	medium 0 to strongest

\*: Option



## 2)Settings

Settings for the scaler are shown below:

>>**Instrument Set Switches** (See[5]3.(5) 3)and 7)of this manual)

- (A)Spray On and Off
- (B)Hand piece Light On and Off \*
- (C)Power Ranges (periodontal,endodontic,scaling)\*\*

>>**Set Switches** (See[5]3.(5) 4) of this manual)

- (D)Set maximum powered for each range

>>**User Settings** iSee[5]3.(7)7),a of this manual)

- (E)Scaler continuous operation mode.  
(Stand on pedal to start and stop.)

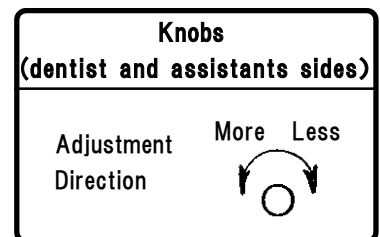
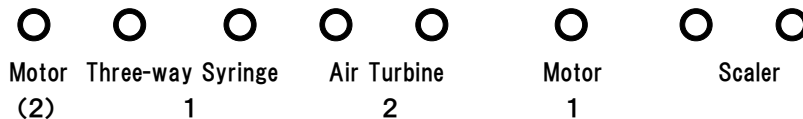
\*\*: Depends on scaler model.

## (9)Air and Water Flow

Air and water flow can be adjusted in the following ways:

### 1)Dentist Instruments

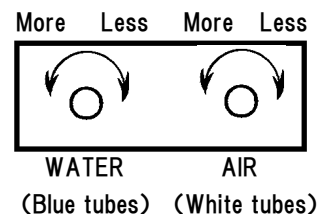
Adjustment knobs are located on the back of the dentist's tray with labels that show how to use them.



### 2)Assistant's Three-way Syringe

See [5]7.(1)1) of this manual.

- a)Open the Unit door.
- b)Follow the rotation and adjust the knob valve on the right hand side.
- c)Close the door of the unit after finishing.



## 7. Basin Unit

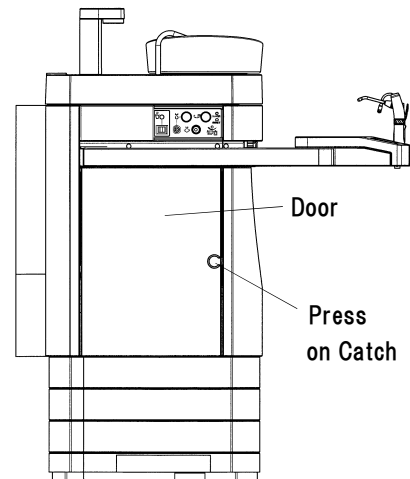
<b>⚠ WARNING</b>	
<b>⊘</b>	<p><b>Never lean on or sit on the basin unit. Do not set heavy objects on it or allow any excessive force to be applied to it.</b></p> <p>&gt;&gt;Any of the above actions could cause the unit to suddenly turn resulting in an accident, bodily injury or damage to equipment.</p>
	<p><b>Do not move the seat or backrest if the door on the basin unit is open.</b></p> <p>&gt;&gt;Doing so could cause an injury or damage.</p>
<b>⚠ CAUTION</b>	
<b>!</b>	<p><b>Ensure the area is clear of obstacles before opening the door.</b></p> <p>&gt;&gt;Otherwise the door or other equipment could be damaged.</p>

### (1)Basin Unit

#### 1)Open and Close Door

Do this to clean the vacuum tank and perform other maintenance inside the basin unit.

- a)Open the door by pressing on the catch in the center along the right hand side. The door opens at an angle of approximately 90 degrees.
- b)Close the door by pushing it in until the catch holds it closed.



#### 2)Remove the Cover

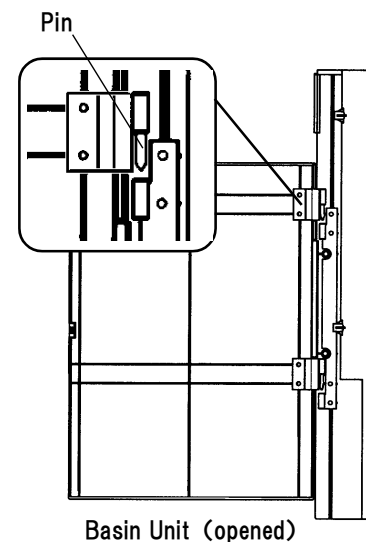
Remove the cover to perform various maintenance procedures inside the basin unit.

- a)Open the door to an angle of approximately 45 degrees.

**ADVICE**

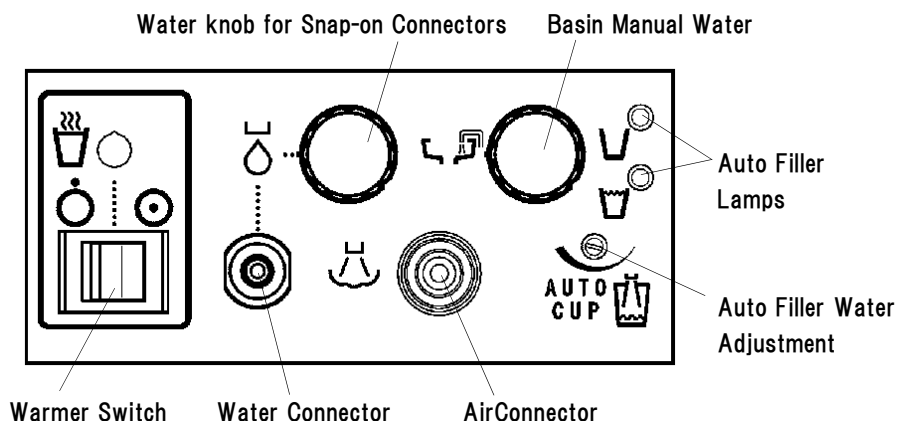
The door will not come off if it is opened to an angle of 90 degrees.

- b)Grip the door and pull it straight up to pull the pin out of the hinge. Now pull the door off.
- c)Reverse the above procedure to replace the cover.  
Line up the pin on the bottom first and then the pin on the top.



Basin Unit (opened)

### 3)Basin Unit Panel



These are the adjustments and connections on the basin unit panel. Their uses are explained below, and in sections [5] 7. and 8. of this manual.

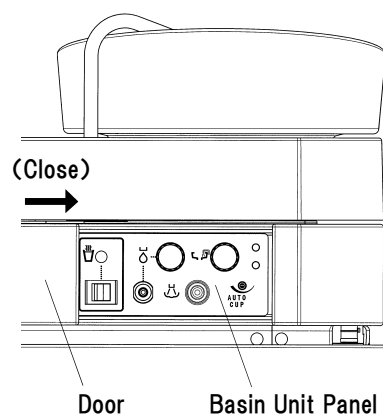
The panel is usually covered by a door. Open the door in the following way.

- a) Pull the right hand side of the door with your finger and slide it all the way to the left.

**ADVICE**

Do not use force to pull on the door or push it in; this could damage it.

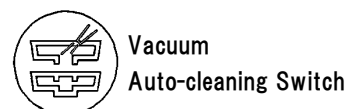
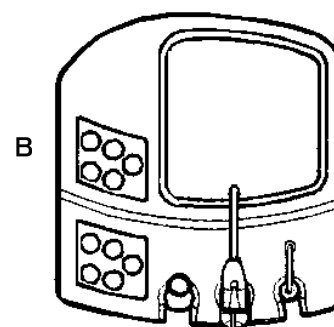
- b) To close the door, push on the left side with your finger and slide it back into place.



### 4)Vacuum Tank Auto-cleaning System

This system cleans the vacuum tank with both air and running water. Do this between patients.\*\*

- a) Press the vacuum auto-cleaning switch on assistant's switch panel B to perform auto-cleaning.
- b) Cleaning will terminate automatically after the specified time has elapsed. To stop it sooner, press the auto-cleaning switch again.
- c) After cleaning has finished, rinse the basin with approximately 2 cups of water.



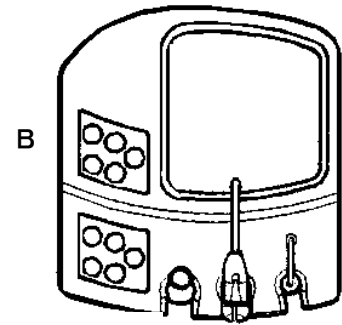
\*\* : Vacuum tank auto-cleaning can be linked to the Reset position for chair auto-positioning. Do this using the User Settings display. See [5] 3. (7) 7) A of this manual.

**5)Flushing Device \***

This is used to flush out all the water lines inside the unit.

Do this once a day.

Switch On the main switch and follow the direction in the display.



Flushing Switch

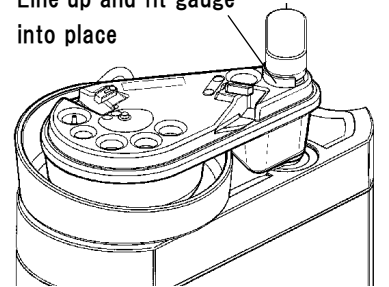
a)Set the flushing bowl up on the basin. Line up and fit the gauge on top of the bowl to the end of the auto filler for correct positioning.

**ADVICE**

There is a magnet in the bottom of the bowl, and a sensor detects whether the bowl is correctly positioned.

When the bowl is in the correct position, the auto filler stops running and “Flushing” appears in the display.

Line up and fit gauge into place



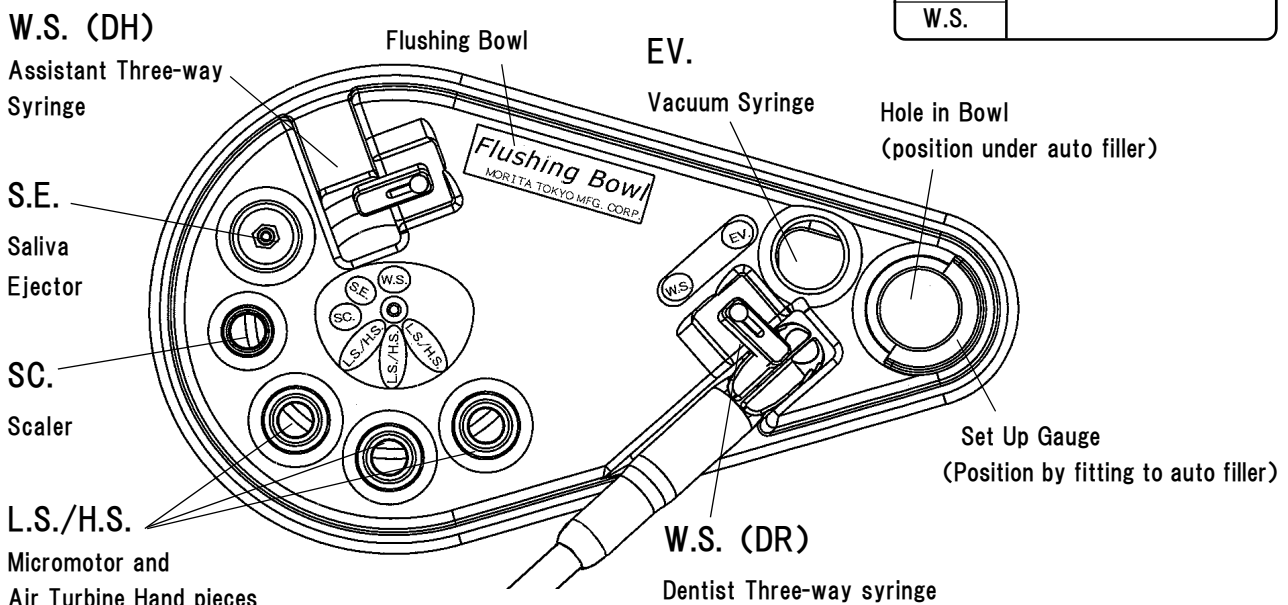
b)Connect the main tubes to the flushing bowl.

Do not fail to connect the tubes in the order shown in the chart at the right and matched to their mates labeled on the bowl.

Fix the water lever for the threeway syringe so that it is held down.

There is a device on the bowl to do this.

Flushing Bowl Connections	
Instrument	Main Tube Set Up
H.S.	Disconnect Hand piece
L.S.	Disconnect Attachment
SC.	Take Tip Off
EV.	
S.E.	Take nozzle off
W.S.	



- c)After connecting all the tubes, press the flushing switch.  
The flushing procedure will be performed automatically.  
It takes approximately 6 minutes.  
Switch lamps will light up to show the progress.



Flushing Switch

Lamp lights up during operation

<Stages>

- Stage 1:Three-way water flows (continues to end of procedure)  
Stage 2:Basin water flows (approximately 30 seconds)  
Stage 3:Water flows from auto filler and vacuum and saliva ejector are activated (approximately 30 seconds)  
Stage 4:Water flows from instrument tubes (approximately 30 seconds)  
Stage 5:Repeat stages 3 and 4 above 4 times.  
Stage 6:Vacuum and saliva ejector are activated (approximately 15 seconds)

- d)The lamp above the switch goes out when the procedure is finished.  
Disconnect all the tubes and put them back in their holders.

**ADVICE**

Be sure to release the retainer holding down the water lever on the three-way syringe. Something could be damaged if the tube is pulled off without doing this first.



Flushing Switch

Lamp above the switch goes out when the procedure is finished

- e)Take the flushing bowl off the basin.

**CHECK**

Most of the water inside the bowl is removed by the vacuum and saliva ejector, but a small amount may be left. If so, pour it out before putting the bowl away.

**ADVICE**

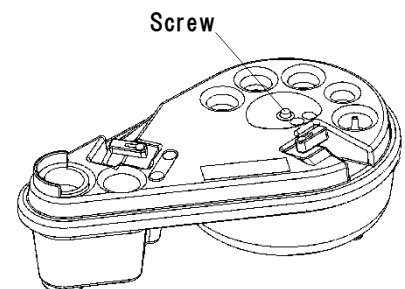
If considerable water is left in the bowl, pour it out through the opening on the bottom of the bowl.

**f)Take Bowl Apart**

The top and bottom of the bowl can be taken apart for cleaning.  
Loosen the screw in the middle of the bowl.



**ADVICE**

Do not tighten the screw too much when putting the bowl back together. This could damage it.

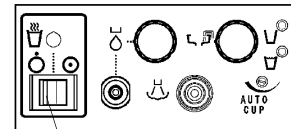


\*: Option

**(2)Warmer**

 <b>WARNING</b>	
	<p><b>Whenever the warmer is turned on pay close attention to how hot the water is. Turn the warmer off whenever it is not needed such as in the summer.</b></p> <p>&gt;&gt;Otherwise, the water could get too hot and burn the patient. Also it could over-heat and breakdown.</p>

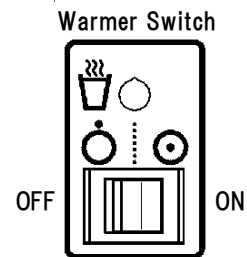
When the warmer is on, all the instruments and the auto cup filler receive a supply of warm water.



**1)Warmer Switch**

The switch that turns the warmer on and off is located on the basin unit panel.

When the switch is turned on, a light above it lights up and the warmer starts to work. The instruments will receive warm water once the heater has had enough time to warm it up.



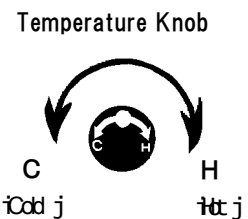
**2)Warmer Temperature Adjustment**

The warmer temperature is set at the factory before shipping, but it can be adjusted in the following way:

- a)Open the door on the basin unit.
- b)Turn the temperature adjustment knob to change the temperature of the water.
- c)Close the door.

**CHECK**

When the warmer is on, the water will not be uniformly warm throughout the various systems. Watch out for places that are hot and be aware of the temperatures of various parts of the system.



### (3)Water and Air Snap On Connectors

#### ⚠ CAUTION



**Ensure these connections are correctly made before using.**

>>If the connection is not correctly fixed in place, water or air could leak or the joint could come off.

If necessary, a supply of water or air can be drawn from this connection on the basin unit panel. Use the special snap-on joints\* to draw water or air from their connections.

#### 1)Use

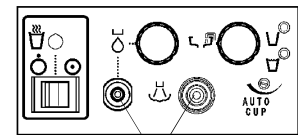
a)Connect the joint to the snap on connection. Push it all the way in until it clicks into place.

b)Water flow can be adjusted with the valve above the connector.  
Air will flow at a steady rate depending on the pressure inside the chair unit.

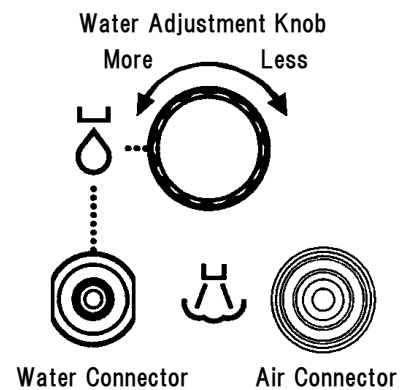
c)Take the water joint off by pressing the release button and pulling it out. Disconnect the air connector by push the ring forward and pulling it off.

#### ADVICE

Grip the connectors firmly to disconnect them. Internal pressure could give them some spring when they are disconnected.  
Please put some Vaseline on the top of joint, smoothly carry out the maintenance per month and be careful do not scraps the O ring.



Connector



Water Connector

Air Connector

### (4)Interlock Switch

The interlock switch turns off certain functions.

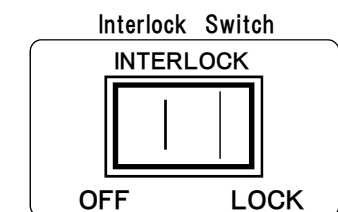
It is usually turned off; this is the factory setting.

The following functions are disabled if it is switched over to the Lock position.

- >>Seat and Back rest Movement (both auto and manual)
- >>Instrument s f or both the dentist and the assistant's  
(except for the assistant's three-way syringe, vacuum syringe and saliva ejector)
- >>Panel switches on both the dentist and assistant's sides  
(except for the assistants vacuum syringe switch, manual water switch and vacuum tank auto switch)

#### ADVICE

Please confirm the operation light is ON when take action for the LOCK.



(normal position)

**(5)Basin**

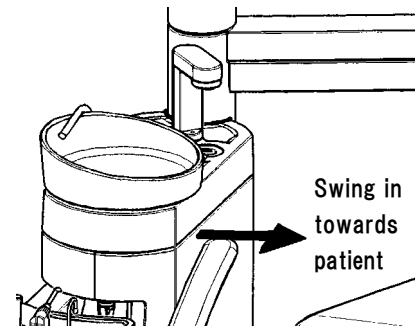
<b>⚠ WARNING</b>	
<b>!</b>	<p><b>Leave the basin over the basin unit and do not use the swivel it over towards the patient except for mouth rinsing.</b></p> <p>Do not let children play with it. Always watch to ensure it is in a safe position. &gt;&gt;Otherwise, pinched fingers or other injuries could result.</p>
<b>⚠ CAUTION</b>	
<b>⊘</b>	<p><b>Do not drop or bump the basin when it is taken off the unit.</b></p> <p><b>Do not scrub it vigorously or use hard or sharp objects on it.</b></p> <p>&gt;&gt;Any of the above could damage or spoil the basin.</p>
<b>⊘</b>	<p><b>Do not leave chemicals with dark or strong colors in the basin for too long.</b></p> <p><b>If some chemical solution happens to be spilled in it, wash it out thoroughly with running water and then wipe it with a sponge or other suitable implement.</b></p> <p>&gt;&gt;Otherwise, the spittoon could become permanently discolored.</p>
<b>!</b>	<p><b>Ensure the basin and its nozzle are securely attached. Do not use a basin if it is cracked, chipped or otherwise damaged. Replace it immediately.</b></p> <p>&gt;&gt;If the basin has not been correctly installed, water could leak, or it could fall off the basin unit. Using a damaged basin could result in an injury.</p>

**1)Basin Swivel**

The basin can be rotated 25 degrees in towards the patient to make mouth rinsing easier. Hold the bottom of the basin and move it carefully.

**ADVICE**

Be sure to put the basin back in its original position before moving the chair. A safety switch is activated when the basin is moved and the back rest will not go up.(refer to [5]3.(2)4))



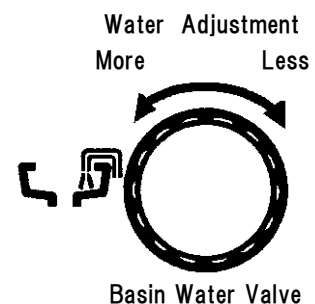
**2)Basin Auto Rinsing**

The basin is automatically rinsed out for a specified time whenever The auto cup filler is used.

**3)Manual Basin Rinsing**

The basin can be rinsed anytime it gets dirty, or it can have a constant flow of rinse water running through it.

Open the valve inside the basin unit to rinse out the basin. The valve also adjusts the flow of water.





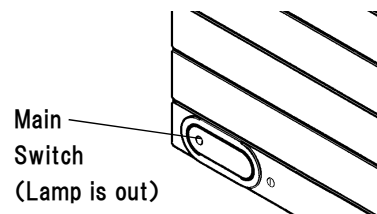
#### 4)Take Off Basin and Basin Nozzle

The basin and its nozzle can be taken off for cleaning.

a)Turn the main switch off.

**ADVICE**

If the main switch is on, the sensor for the auto filler will be activated and water will splash around the area.



b)Take off the basin nozzle.

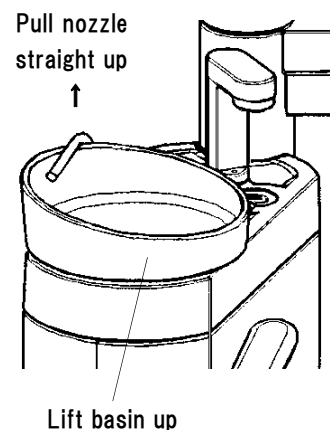
Hold the basin down and pull the nozzle straight up.

c)Take basin off.

Put your fingers in the gap between the basin and the top of the basin unit and ease the basin up slightly. Then press down on the top of the unit and pull the basin straight up and off.

**ADVICE**

If you do not hold down on the top of the basin unit and use excessive force to take the basin off, the swivel mechanism could be damaged.  
Back of the Basin is base of the Dirt-repellent.  
Please be careful if you scrub it or use hard or sharp objects on it, it could be damaged.



d)Reverse the order of the steps above to reassemble.

Line up the indentation on the bottom of the basin with the projections in the top of the basin unit and carefully push the basin back into place. Line up the pin on the nozzle with the groove inside the basin and slide the nozzle all the way back into place.

**ADVICE**

If the basin is not put back properly, the nozzle will not go back in. Ensure the indentations and projections on the bottom of the basin are correctly line up.

**CHECK**

If it seems hard to put the basin back in, coat the rubber parts on the top of the basin unit with Vaseline.

**<Information>**

Due to the manufacturing method, you may be able to see tiny bubbles in the surface of the basin.

## 8. Water Fountain

### ⚠ CAUTION



**Do not bump the fountain or expose it to other types of physical shocks or excessive stress.**

>>This could damage the fountain and cause it to stop working.

**Never run water through the fountain if its nozzle has been removed.**

>>This would result in water shooting straight up in the air.

### (1)Auto Filler

### ⚠ CAUTION



**If the sensor is dirty, wipe it carefully with a dry cloth.**

>>Otherwise, the auto filler will not work right.

#### 1)Auto Cup Filling

Place a cup on the stand. (The cup can be of any material, paper, metal, etc.) The cup will be detected and filled to the specified level.

If the cup is already full when it is detected, a little water will run and then stop.

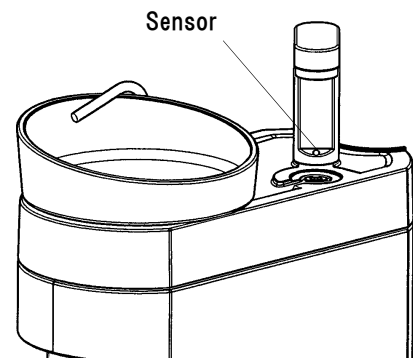
The auto filler can be turned off. Select the User Settings Display. (See [5] 3. (7) 7) of this manual.)

#### CHECK

Do not use transparent or semi-transparent cups. They may not be detected by the sensor.

#### ADVICE

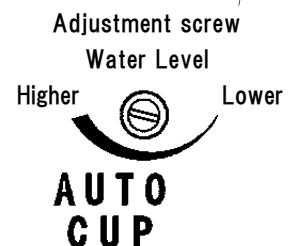
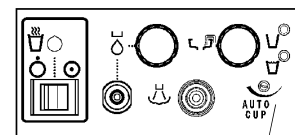
To prevent accidental activation, there is a 1 second delay after the cup is set in place before the water starts to run. Put the cup in place carefully.



#### 2)Set Cup Water Level

This is set at the factory using the small dental cup as a standard. It can be changed in the following way:

- The adjustment screw is on the basin unit panel. Turn it with a miniature screwdriver.
- Follow the marking for the screw to adjust the level.
- Put a cup in place and check the level.



### 3)Manual Cup Filling

Hold down the manual cup filler switch on the assistant's side or the dentist's spray switch when all the instruments are put away.

Water will fill the cup only while the switch is held down.

**ADVICE**

Ensure a cup is in place before doing this; otherwise, water will be splashed around.



Assistant's Side



Dentist's Side

### 4)Cup Coaster

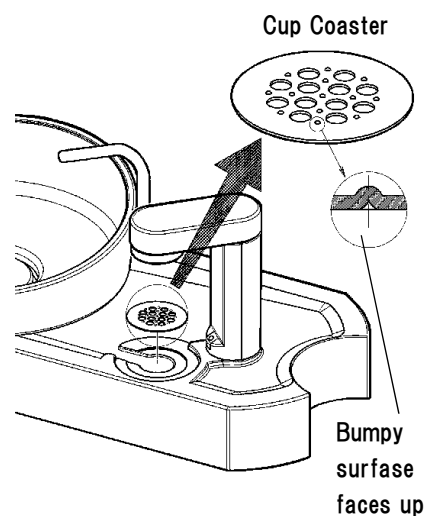
The coaster on the cup stand can be removed for cleaning.

Stick your finger in the groove on the cup stand and lift the coaster up.




When replacing it, ensure the bumps are facing up.

**CHECK**

The bumps prevent the cup from sticking to the coaster; make sure they are facing up.



## 9.Dentist's Tray

 <b>WARNING</b>	
	<p><b>Never set objects weighing more than 30N(3kgf) on the tray table. Do not use force to move the tray and do not subject it to bumps or other physical shocks.</b></p> <p>&gt;&gt;A load greater than 30N could cause the tray to fall down resulting in bodily injury or damage to equipment.</p>
	<p><b>Ensure the tray knob is properly adjusted.</b></p> <p>&gt;&gt;Otherwise, the tray could suddenly spring up or fall down resulting in an accident or damage to equipment.</p>

### (1)Over Arm and Floor Arm

#### 1)Operation

The tray can be rotated horizontally or lifted up and down.  
Grip the tray's handle and move it carefully.

#### 2)Adjust Action of Movable Arm

The action of the movable arm can be adjusted depending on how much weight is placed on the tray.  
Adjust it in the following way:

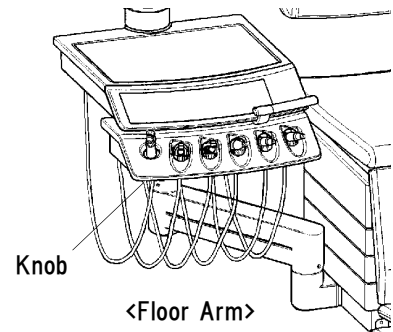
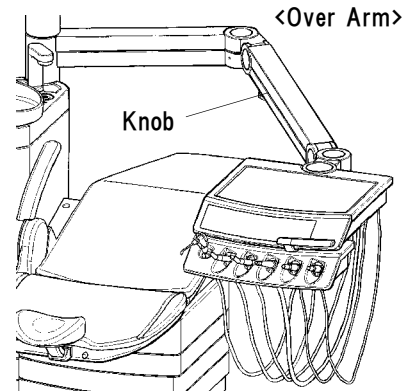
##### a)For a heavy load (or to make the up and down action stiffer)

Tighten the movable arm's knob to make its action stiffer and keep it from sagging up a heavy load.  
Tightening this knob completely will lock the arm in place and keep it from moving up and down.

##### b)For light loads (or to make its action looser)

Loosen up the knob for freer tray action.

**ADVICE** Keep a grip on the handle when loosening the knob. Otherwise, the tray could suddenly spring up if it was being held in a low position.



**(2)Cart Type \***

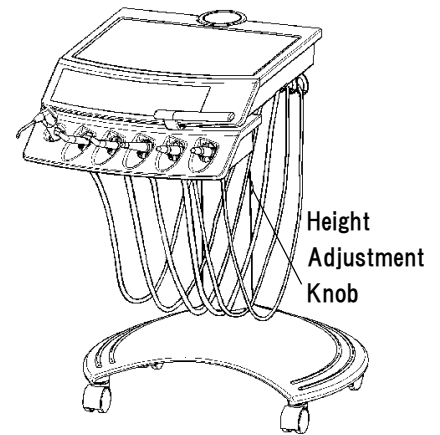
**1)Operation**

Push the cart on its casters to place it in the best position.  
Grip the handle and move it carefully.

**2)Height Adjustment**

Adjust the height of the tray in the following way:

- a) Hold the tray steady and loosen the knob on the support column.
- b) Move the tray up or down to the desired height and then retighten the knob.



\*: Option

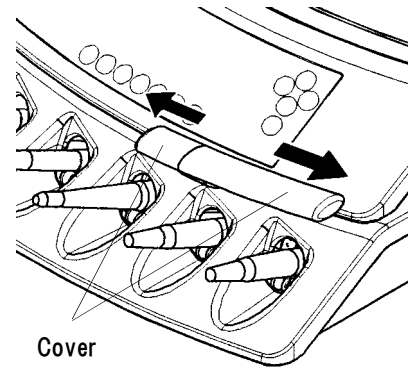
### (3)Tray Handle

#### 1)Remove Silicone Cover

The cover for the tray handle can be removed for autoclaving (135c) or disinfection with alcohol .

Simply pull the 2 parts of the cover to the left and right.

Replace them by matching them to the handle and pushing them back into their original positions.



### (4)Waste Container

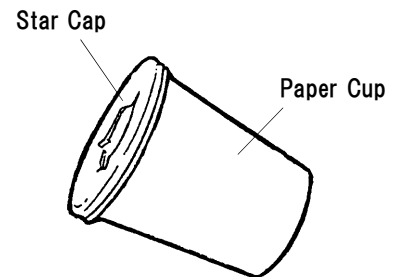
Place a waste container in the holder for it.

Use the cups and star caps provided.

#### 1)Make Container

Put a star cap on a paper cup to use as a waste container.

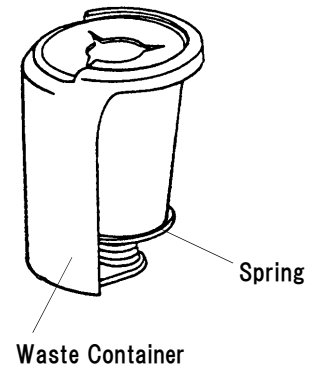
Line up the edge of the cup with the groove inside the cap and press the cap down firmly.



#### 2)Set Up

Put the cup in its holder.

Press the spring in the holder down with the bottom of the cup and slide the cup into the holder.



#### 3)Replacement

Dispose of an old cup in the specified, safe manner and replace it with a new one.

Press the spring in the holder down with the bottom of the cup and slide the cup into the holder.

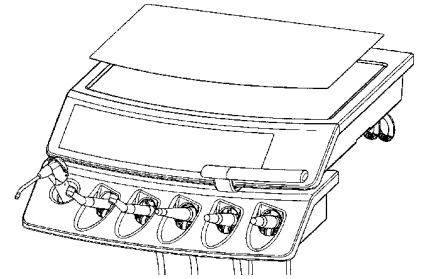
When you run out of cups or caps, order a new supply from your local dealer or J.Morita Corp.

**(5)Tray Paper**

Spread a sheet of this paper on top of the tray.

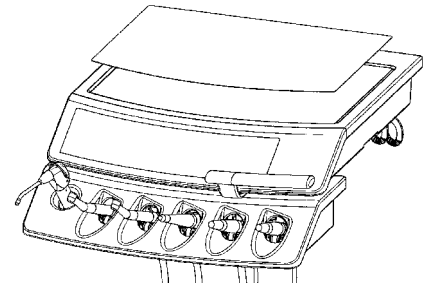
Replace the paper whenever necessary.

Contact your local dealer or J.Morita Corp. for a new supply of paper.

**(6)Silicone Tray Sheet \***

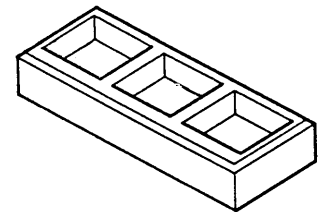
Lay this on top of the tray.

This silicone sheet may be disinfected by wiping with alcohol or autoclave.

**(7)Silicone Medicinal Vial Holder\***

Place this holder on the tray to hold vials of medicine or other solutions.

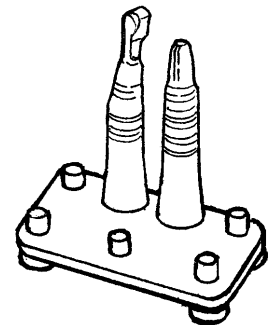
This holder may be disinfected by wiping with alcohol or autoclave.

**(8)Contra Stand\***

Place on tray for holding micromotor contra heads and other attachments.

This stand holds up to 7 attachments (ISO standard attachments for 40,000 min<sup>-1</sup> micromotors).

Replace the oil absorbing pad whenever necessary. Contact your local dealer or J.Morita Corp. for new pads.

**(9)Switch Panel Cover \***

Disposable covers for the switch panel. Protects the panel from scratching and other damage.

Available for both dentist and assistants switch panels.

\*: Option

## 10. Amalgam separator \*

### ⚠ CAUTION



**Do not switch ON the main switch when the auto filler is connected with cup.**  
>>Otherwise,error reaction of amalgam separator exchange signal will indicated.  
Ensure the auto filler has been removing from the cup before switch ON the main switch.

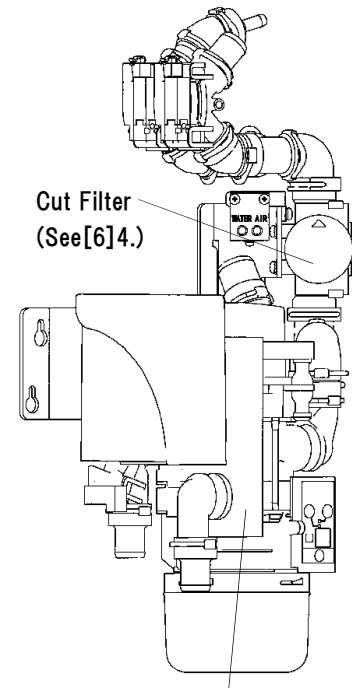
Please follow the directions in the manual.

### ADVICE

Ensure the unit where the water connection do not ON has been set for about 15 seconds before function of main switch is turned on.

(To prevent the malfunction of Amalgam separator)

It is not a breakdown between the auto filler or the water supply mechanism work.



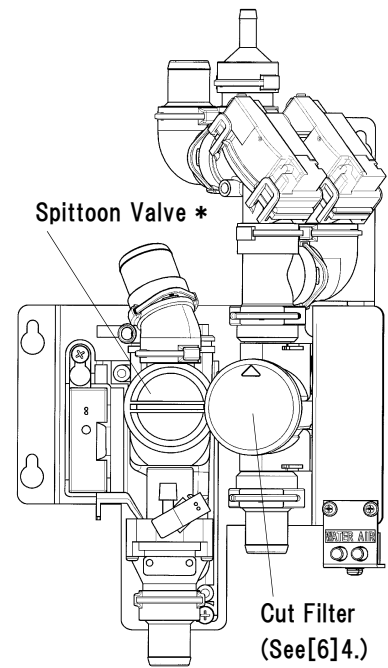
Amalgam separator \*

\*: Option



## 11. Spittoon Valve \*

Please follow the directions in the manual.



\*: Option

## 12. Tube Lifters

### ⚠ CAUTION



**Do not hold onto the ring and pull or yank the wire with too much force.**  
 >>Doing so could cause the wire to break resulting in a serious accident or injury.

### (1)Function

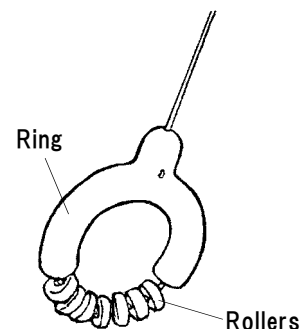
The tube lifters are on the back of the dentist's tray.

They hold the tubes up so that the tubes will not touch the floor and get contaminated or dirty.

### (2)Ring

The ring and its rollers can be disinfected by wiping with alcohol.

To take the main tubes out of their rings, refer to [5] 5. (1) 4) of this manual.



### (3)Wire Stoppers \*

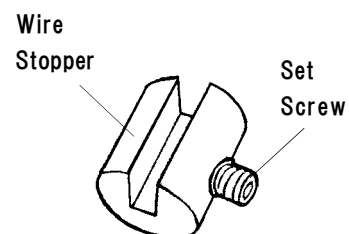
The wires use a spring to hold the tubes up.

If there is too much load on the tubes, the wires can be extended and the load reduced with the wire stoppers.

1)Hold the ring and pull the wire out to the right length.

2)Put the wire stopper on the wire so that it is stopped at the right length.





Fit the wire into the groove in the wire stopper and tighten up the set screw. (1.5mm Allen wrench)



\*: Option

# 13. Operating Light

## (1)Luna Vue ED Light

 <b>WARNING</b>	
	<p><b>Do not touch the lamp, front cover, reflector or any metal parts when the light is on or immediately after it is turned off. Do not use the light with the front cover taken off. Do not use any part except the handle to move the light.</b></p> <p>&gt;&gt;These parts are extremely hot and could cause a burn; also the lamp could break.Do not bump or jar the light head or the light arm.</p>
	<p><b>Do not get the light wet; if it happens to get wet, turn off the main switch and remove all moisture immediately with a dry cloth. Do not use the light until it is completely dry.</b></p> <p>&gt;&gt;Otherwise an accident could occur resulting in bodily injury or equipment damage.</p>
	<p><b>Follow the directions and put the front cover on correctly and securely. Replace the front cover immediately if it is discolored, deformed, cracked or otherwise damaged.</b></p> <p>&gt;&gt;If the cover is not correctly installed or damaged, it could fall off and cause a serious injury.</p>

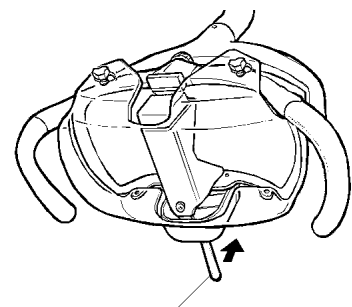
### 1)Operation

Use the handles to line the light up.

Push back the switch on the bottom of the light to turn it ON.

Pull it forward to turn the light OFF.

If the unit has the auto light function (see (4)below), the light can be turned on and off automatically or with the switch on the switch panel.



Switch Pull : Off  
Push : On

### 2)Settings

The following settings can be made for the Luna Vue ED Light:

>>**On and Off Switch** (See [5] 3. (5) 8) of this manual.)

(A)Turn light on and off

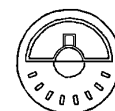
>>**Display Selection**(See [5] 3. (7) 4) of this manual.)

(B)Adjust brightness (8 levels)

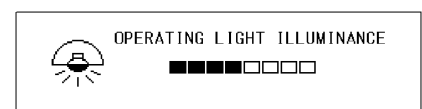
>>**User Settings** (See [5] 3. (7) 7) of this manual.)

(C)Operating light on and off options.

(Turns on and off when handpieces are picked up and returned.)



Operating light on and off switch



\*: Option

### 3)Front Cover Removal

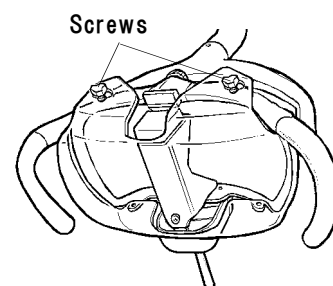
a)Loosen the two screws on the light head.

**ADVICE**

These screws will not come all the way off. Do not try to forth them out.

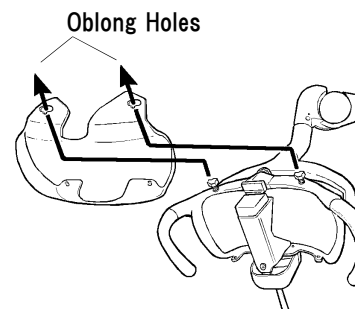
b)Take the front cover off.

Pull the cover out a little and then lift up past the screws.

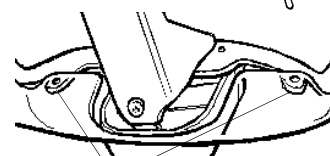


### 4)Replace Front Cover

a)Hook the oblong holes on the top of the cover over the screws on the top of the light head.



b)Fit the two studs on the bottom of the cover into the holes in the bottom of the light head.

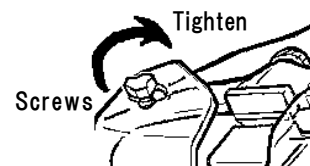


c)Tighten up the two screws on the top of the light head.

Before tightening the screws, push the cover against the light head so that the screws will be correctly seated on the oblong part of the holes in the cover.

**CHECK**

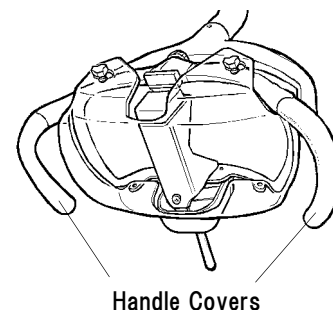
Ensure the front cover is securely installed. If the studs on the bottom are not in their holes or if the cover is wobbly even though the screws have been tightened, take it off and put it back on again properly.



### 5)Handle Cover Removal

The handle covers may be removed for autoclaving (135°C) or disinfection with alcohol. Pull gently on the covers and slide them off.

To replace the covers, line them up with the groove in the handle and push them all the way on.








### 6)Focal Distance

The light is set to provide the optimum brightness and field of illumination when the lamp is from 60 to 100 cm away from the patient's oral cavity.

Contact your local dealer or J.Morita Corp. to adjust or modify the light's optimum focal distance.

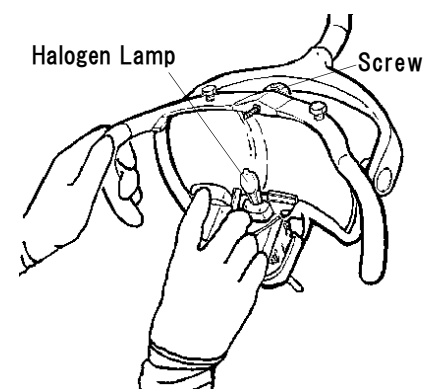
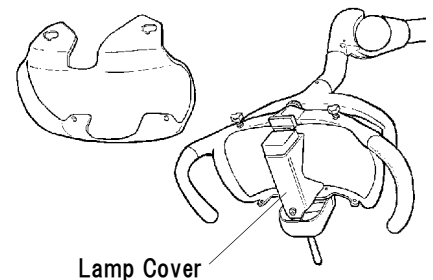
## (2) Replacing the Halogen Lamp

 <b>WARNING</b>	
	<p><b>Do not get fingerprints on the halogen lamp. If fingerprints get on the lamp wipe them off with a piece of gauze moistened with alcohol.</b></p> <p>&gt;&gt;If the oil from fingerprints is left on the lamp, it could crack, and someone could be injured by scattered fragments of glass.</p>
	<p><b>Wait for the lamp to cool off before trying to replace it.</b></p> <p>&gt;&gt;The lamp is extremely hot light after it has been turned off and could cause burns if touched.</p>
 <b>CAUTION</b>	
	<p><b>Do not use excessive force or push the lamp in at an angle.</b></p> <p><b>Do not press down too hard when attaching the front cover.</b></p> <p>&gt;&gt;Otherwise these parts may be damaged.</p>

Replace the halogen lamp when it burns out.

Follow the steps below:

- 1) Turn off both the main switch and the light switch.
- 2) Take off the front cover.  
See (1) 3) above.
- 3) Open the lamp cover.  
Loosen the screw on the head side and pull the cover forward.
- 4) Take the old lamp out of its socket.  
Pull it straight up to remove it.
- 5) Put in the new lamp.  
Hold the new lamp with the protective bag it comes in and push its 2 leads straight down into the socket. Then take the bag off.
- 6) Reverse the above procedure. Close and secure the lamp cover.
- 7) Replace the front cover in its original position.  
See (1) 4) above.



**(3)Re-Trak Mirror\***

\*: Option

This mirror can be used by the patient without blocking the light.  
It can be installed anytime before or after installation of the main unit.  
Contact your local dealer or J.Morita Corp. for details.

**1)Handling**

Use the little handle on the mirror to pull it down in front of the light.  
Position it 15 to 30 cm from the patient for easy viewing.  
Swing it back up on top of the light when it is not in use.

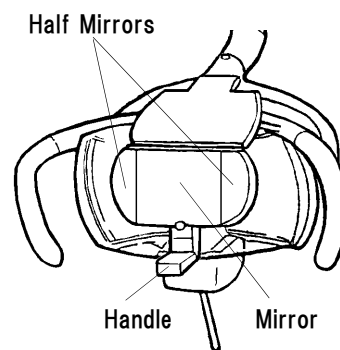
**2)Use with and without the light on**

**a)For a well lighted view**

Use the mirror with the light on to give the patient a well-lighted view of his own oral cavity. The half mirrors on both sides cut out approximately 40% of the light; this brightness level is better for the patient to see clearly.

**b)For viewing a larger area**

Put the mirror in position with the light shining into the patient's oral cavity and then turn the light off.  
The mirror will include the half mirrors on both sides and give the patient a view of an area twice the size of the one when the light is on.  
The half mirrors on the sides will not be quite as bright as the main mirror in the center.



**(4)Auto Light\***

If the unit is equipped with auto light, it will work in the following way:

**1)Auto On and Off**

The light can be linked to the auto-positioning switches on both the dentist and assistant's sides.  
The chart to the right shows when it will turn on and off. It can also be set to turn on when an instrument is picked up. (See (1) 2) above.)

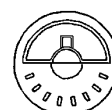
**2)Touch-free Operation**

The light can be turned on and off by stepping on the pedal when all the dentist's instruments (except the three-way syringe) are put away.  
Step on the pedal to turn it on and step on the pedal again to turn it off.

**3)Switch Operation**

Switches to turn the light on and off are located on both the dentist and assistant's sides.

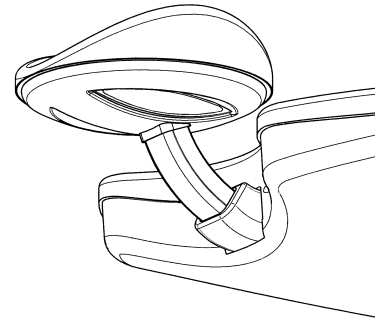
Auto Light Operation	
Switch	ON or OFF
Positions 1 and 2	ON
Reset	OFF
Memory(mouth rinsing)	OFF
Memory(return)	ON



Operating Light Switch

## 14. Head rest

<b>⚠ WARNING</b>	
<b>⊘</b>	<p><b>Keep fingers, hair, clothes etc. away from the moving parts of the head rest.</b></p> <p>&gt;&gt;An injury could result from fingers being pinched or hair etc. being caught in the moving parts.</p>

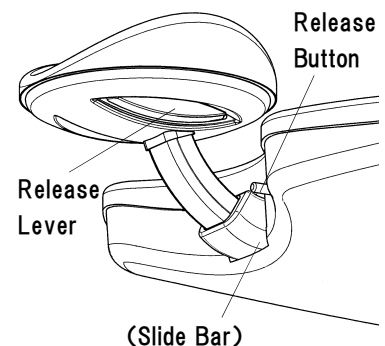


The Natural Movement Head rest (manual) is the standard equipment. The powered head rest has the same shape and movement range.

### (1)Natural Movement Headrest <Up and Down Slide Type>

<b>⚠ WARNING</b>	
<b>!</b>	<p><b>Support the headrest carefully to adjust its angle or push the slide bar in.</b></p> <p>&gt;&gt;If the release button is pressed when the head rest is not supported, it could suddenly fall down and this could injure the patient. Also sudden movement of the head rest could injure t he patient 's neck or head.</p>

The natural movement headrest has a movement pattern that matches the human anatomy so that no stress is applied to the patient's neck and his head is held securely.

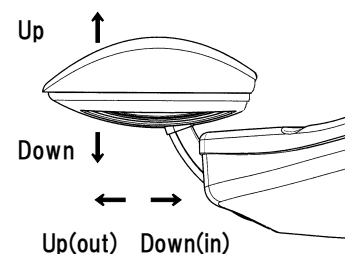


#### 1)Slide Bar

The head rest slides in and out on a step less continuum. Grip the head rest firmly, press the release button on the back rest, and then slide it in or out. Let go of the release button to secure it in place.

#### 2)Angle Adjustment

No step adjustment within a specified range. Press the release lever, move the head rest to the desired position, and Then let go of the release lever.



**(2)Powered Head rest \* <operated with foot control>**

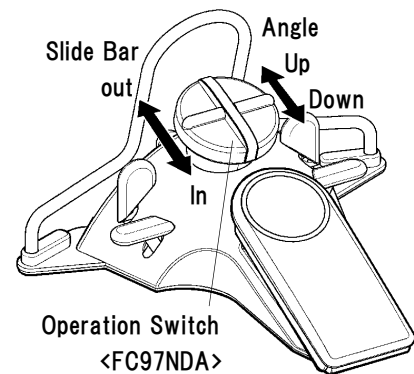
<b>⚠ WARNING</b>	
<b>⊘</b>	<p><b>Always warn the patient before moving the powered head rest.</b>  <b>Also check the patient's position, especially fingers and hair.</b>                  &gt;&gt;Suddenly moving the head rest could injure the patient's head or neck, pinch fingers, pull hair or result in other similar types of accident.</p>
<b>⚠ CAUTION</b>	
<b>!</b>	<p><b>Please be careful the rack and pinion assembly can sometimes disengage when the head rest angle or slide bar reach their upper or lower limit.</b>                  &gt;&gt;To protect assembly from damage, sometime you will need to unfasten rack and pinion assembly.</p>

**1)Operation**

The head rest is controlled with the switch on top of the foot control (FC97D/DA). (See illustration to the right.)

The head rest moves only while a switch is being pressed.

If the angle or slide bar reaches its upper or lower limits, the head rest will automatically stop. Release the switch at this time.



**2)Rack and Pinion Restoration**

The rack and pinion assembly can sometimes disengage when the head rest angle or slide bar reach their upper or lower limit.

This is to protect the assembly from damage due to an overload.

The assembly can be restored in the following way.

(There is no need to remove the back rest.)

**>>For slide bar maximum extension**

Push the head rest down and at the same time press the down switch

**>>For slide bar minimum extension**

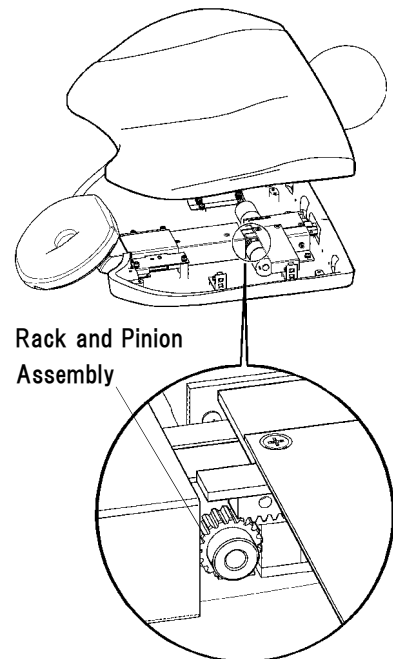
Pull up on the head rest and at the same time press the up switch

**>>For maximum up angle**

Push the head rest down and at the same time press the angle down switch

**>>For maximum down angle**

Pull up on the head rest and at the same time press the angle down switch



**ADVICE**

If the rack and pinion assembly disengages, this could be due to a circuitry or some other problem. Immediately contact your local dealer or J.Morita Corp.

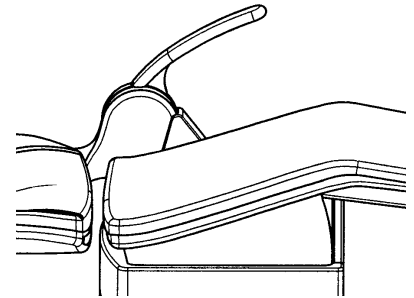
\*: Option



## 15. Armrest

### (1) Armrest on Assistant's Side

The armrest on the assistant's side is fixed in place and cannot be adjusted.



### (2) Movable Armrest on the dentist's side\*

#### WARNING



Keep fingers clear of the area where the armrest on the dentist's side rotates. Also keep the instrument holder and any other equipment clear of the armrest.

>>An injury could result from pinching the fingers.

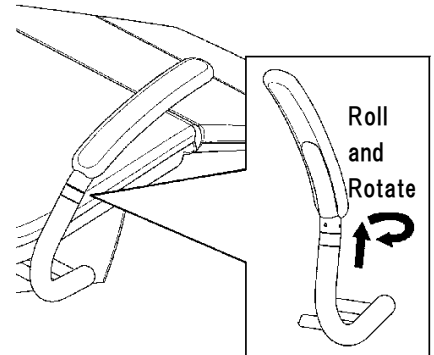
#### 1) Raising and lowering the armrest

Lower the armrest to allow the patient to get in and out of the chair easily.

When raised, the armrest is locked in position and will not move.





To lower the armrest, pull up on it and swing it out and all the way down.

To raise it, swing it back up. It will lock into position.



## 16. (Optional Parts)

## 17. Display \*

 <b>WARNING</b>	
	<p><b>While arranging or moving, please be mindful of security while placing the unit on display. In particular, exercise care that it does not strike the human body and that the torn arm is not subjected to any impact.</b></p> <p>&gt;&gt;Otherwise, an accident or injury may occur.</p>
	<p><b>The size and weight of a monitor that can be installed onto the machine are specified in the operation manual of the optional special tone arm that is sold separately. Please follow the written directions.</b></p> <p>&gt;&gt;Either of these actions could be dangerous or cause damage.</p>
 <b>CAUTION</b>	
	<p><b>When placing the unit on display, please follow the relevant regulations and agreement for the IEC60950 (Machine security information) and IEC60065 (security of electron machine) .</b></p> <p>&gt;&gt;Otherwise, leakage could be result in an accident or injury.</p>

It is possible to place a small screen display on the unit. In this case, a special tone arm\* will be necessary.

Additional parts can be installed after purchase. (However, additional cabling work will be necessary in this case.)

Please contact your local dealer or J.Morita Corp.for details about additional options.

**CHECK**

Due to the size and weight limitations of the screen display, not all displays on the market can be used.

(The model may be specified in some cases)

Please contact your local dealer or J.Morita Corp. for details.

### (1)Arm Operation

Joints can be moved and an optional base added if put on special display.






Please follow the directions in the manual.

### (2)Display Handling

Please follow the directions in the manual.

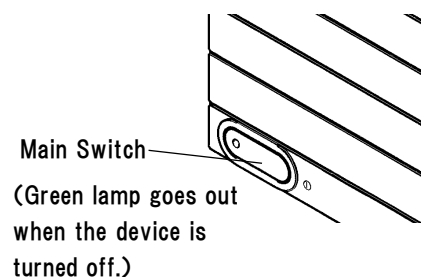
\*: Option

## 18. After Use

 <b>WARNING</b>	
	<p><b>Turn the main switch off whenever the unit is not being used.</b>  <b>If the unit will not be used for a considerable length of time, unplug the main power cord and close the main valves for both the air and water.</b>                      &gt;&gt;This will prevent various types of potential problems from occurring such as fire or accidents due to leaking electricity, water leakage or both.</p>
	<p><b>Before plugging the unit back in and opening the air and water valves, ensure all the wiring and tube connections have been securely made.</b>                      &gt;&gt;Otherwise, there is a risk of accidents and malfunctions due to short-circuiting, overheating, water leakage, etc.</p>
	<p><b>Never let electrical plugs or receptacles get wet or gather dust.</b>  <b>If a plug or receptacle gets wet, immediately unplug the unit, and completely dry the plug or receptacle before using the unit.</b>  <b>If dust has collected on a plug, unplug the unit and carefully clean off all the dust with a dry cloth or other material.</b>                      &gt;&gt;Short-circuiting or overheating caused by wet or excessively dusty plugs can result in accidents such electric shocks,files and equipment damage.</p>
 <b>CAUTION</b>	
	<p><b>Please observe the following safety conditions.</b></p> <ol style="list-style-type: none"> <li>1)Temperature: -10~70c</li> <li>2)Humidity : 10~85%RH</li> <li>3)Air pressure : 700~1060hPa</li> <li>4)Put it in a the security place.</li> <li>5)Do not place the equipment in an area with conditions that do not matched those mentioned above, including areas containing excessive amounts of dust or salt.</li> </ol> <p>&gt;&gt;Otherwise, damage or injury may result.</p>

### (1)After Use

Turn off the main switch when you have finished using the unit.



## (2)For Extended Shut-down Periods

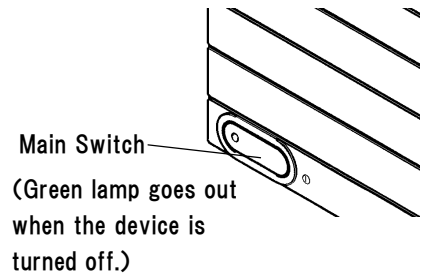
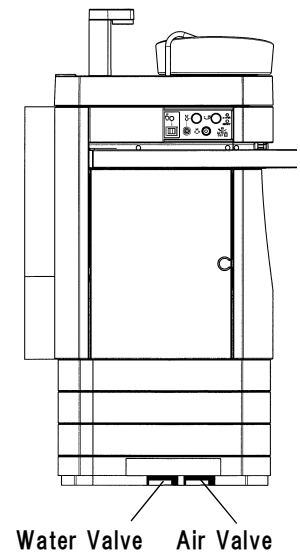
When the unit will not be used for an extended period of time, or in cases when it is not working properly, turn off the main switch and close the main water valve.

Follow the procedure below.

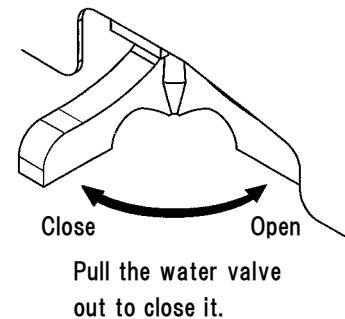
**<Be sure to turn off the water when undertaking the following procedures or when the following conditions exist>**

- >>If the auto filler does not turn off
- >>To replace the bacteria filter
- >>When water is leaking from the unit
- >>If the chair is malfunctioning and needs repair
- >>In case of earthquakes, fires, etc.

1)Turn the main switch off.



2)Close the water valve for the plumbing pit

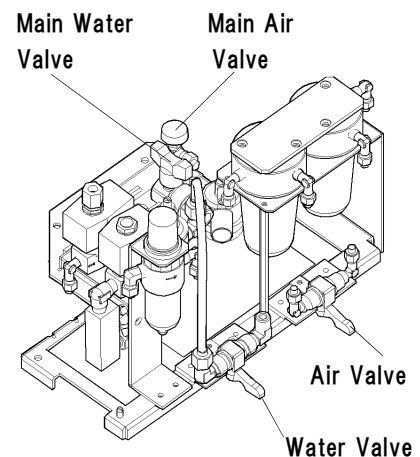


3)Reverse the above procedures to start using the unit again.

4)Close the water valve inside the plumbing pit if the unit will not be used for a very long period of time.

Refer to section [6] 11. of this manual.

Open up the plumbing pit and close the water valve.



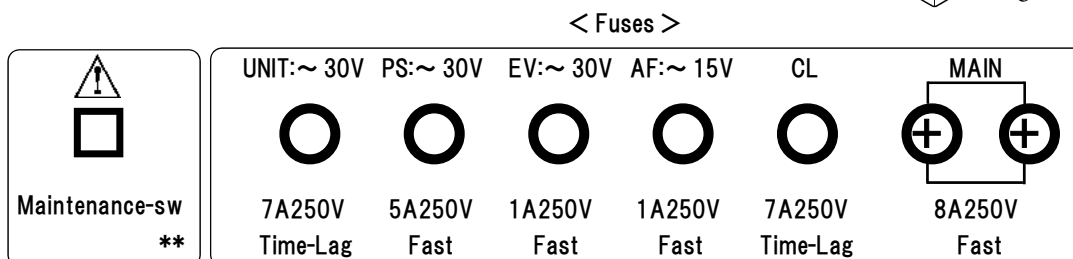
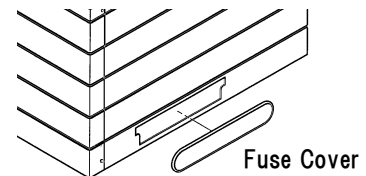
< Plumbing pit under the unit >

## 19. Fuses

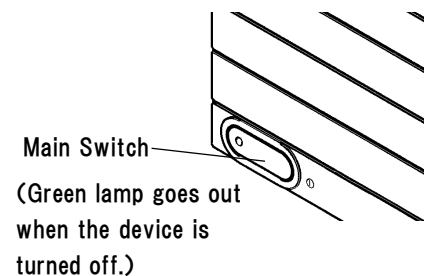
<b>⚠ WARNING</b>	
<b>!</b>	<p><b>Before replacing fuses, always turn off the main switch.</b></p> <p>&gt;&gt;Otherwise, you could receive an electric shock or be affected by another type of accident that may result in bodily injury or damage to equipment.</p>
	<p><b>A blown fuse indicates a problem in the electronic circuitry, and the unit should be inspected as soon as possible. In this case, contact your local dealer.</b></p> <p>&gt;&gt;Continued use could result in accidents or malfunctions due to leaking electricity, or other similar problems.</p>
<b>⚠ CAUTION</b>	
<b>⊘</b>	<p><b>Always replace fuses with ones of the same type and capacity.</b></p> <p>&gt;&gt;Using the wrong type of fuse or a substitute such as a piece of wire may result in damage to equipment due to the wiring overheating and burning.</p>

### (1) Replacing Fuses

The fuses are located at the bottom on the side of the housing. Follow the below procedure to replace fuses. Use a medium size Phillips screw driver.



- 1) Turn the main switch off.
- 2) Take the cover off the fuse box, which is located on the side of the housing under the step. Push it up and pull it off.
- 3) Replace the fuse.  
Take the cap off the fuse holder. (Use a medium size Phillips screwdriver for the 8A fuse.) Take out the blown fuse and replace it with a new one.
- 4) Reverse the above procedure to replace all components in their original positions.



### **CHECK**

If the fuse blows again, this may indicate a problem with the wiring. In this case, stop using the unit and turn the main switch off. Then contact your local dealer or J.Morita Corp. to have the unit inspected.

\*\*Do not use the Maintenance Switch; this is only for use by a qualified serviceman.

## [6]Maintenance

### CAUTION



**Always turn the main switch off before cleaning and performing other maintenance procedures. Also close the air and water valves if necessary.**

>>Otherwise bodily injury or damage to equipment could result from an accidental operation, electric shocks or other types of accidents.

**Always wear surgical gloves to prevent contamination when cleaning and performing other maintenance procedures.**

>>Otherwise contamination could spread through the entire clinic or hospital.

**All instruments used inside the oral cavity must be cleaned and disinfected without fail.**

>>Otherwise infections could be spread among patients and workers at the clinic.

**When using an autoclave or similar type of disinfection device, follow the instructions in the manual for the instruments that are being used and disinfected.**

>>Otherwise, the instruments being disinfected or the disinfection device could be damaged.

**Everyday or as Frequently as Necessary**

## 1. Autoclave Sterilization

### CAUTION



**Always put instruments and other objects to be sterilized in a basket, tray or sterilization pouch so that they do not make contact with the inside walls of the sterilization chamber.**

**If the autoclave uses a very high drying temperature, take the instruments out as soon as they are disinfected.**

>>Instruments can be damaged if they come in contact with the interior walls of the sterilization chamber or are subject to excessively high temperatures.

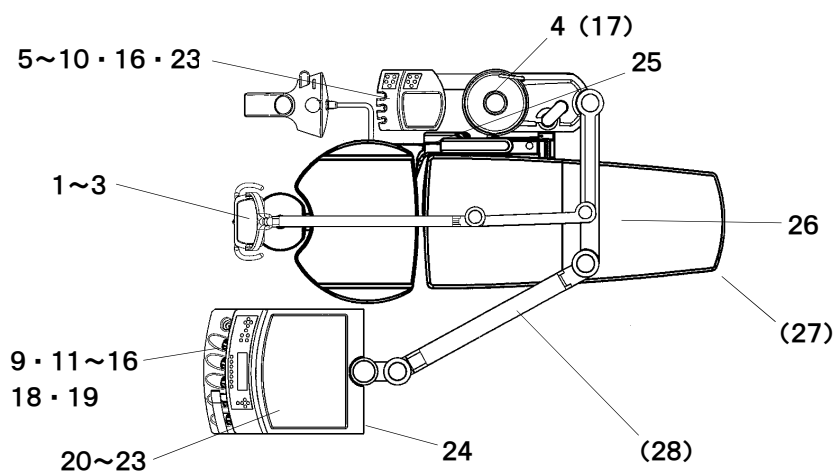
Refer to the list on the following page for which instruments and components may be sterilized by autoclave.

Detailed autoclaving instructions are indicated in section(1)to(3) below.

<Autoclave Sterilization>

<Alcohol Disinfection>

Instrument and Component List



**Bold lettering indicates instruments or components that can be autoclaved or disinfected with alcohol.**

Standard lettering indicates instruments and components that can only be disinfected by wiping them with alcohol.

\* : Option

\*\* : This depends on the model; refer to the separate operator's manual for information about the instrument installed on your unit.

\*\*\* : Certain specially ordered colors cannot be disinfected with alcohol.

\*\*\*\* : Avoid wiping areas near joints and shafts and plastic surfaces that are not coated.

No.	Item	No.	Item
1	<b>Luna Vue ED Light Handle Covers</b>	17	Flushing Bowl *
2	Luna Vue ED Light Front Cover and Reflector	18	Top cover of Dentist's Holder
3	Luna Vue ED Light Switch	19	Roller Blocks and Sheath for Dentist's Holder
4	Basin,Basin Catch,Fountain Nozzle,Cup Sensor	20	<b>Tray Handle Silicone Cover</b>
5	<b>Vacuum Syringe Body</b>	21	<b>Silicone Medicinal Bottle Holder</b>
6	<b>Vacuum syringe L-shaped Tip and rubber tip</b>	22	<b>Silicone Tray Sheet</b> *
7	<b>Saliva Ejector and Nozzle</b>	23	Contra Stand *
8	<b>Saliva Ejector Body</b>	24	Tube Lifter Ring and Rollers
9	<b>Three-way Syringe Nozzle and Body</b>	25	Armrest (both standard and optional arm)
10	<b>Light Cure Light Guide</b> **	26	Leather for Head rest,Back rest and Seat ***
11	<b>Air Turbine Hand piece</b> **	27	Safety Mat (for model with step)
12	<b>Micromotor Attachments</b> **	28	Enamel and Metal Surfaces of Main Unit ****
13	<b>Micromotor Motor Cover</b> **		
14	<b>Ultra Sonic Scaler Tips and Body</b> *		
15	<b>Air Scaler Tips and Body</b> *1		
16	Instrument Tubes < silicone >		

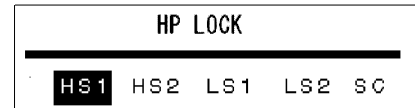
**(1)Sterilization for:**

- Air Turbine Hand pieces
- Micromotor Attachments
- Micromotor Motor Cover
- Scaler Tips and Hand pieces

This depends on the model; refer to the separate for information about the instruments installed on your unit.

**ADVICE**

If one of the instruments in the dentist's holder has been disconnected, the other instruments can still be used by releasing the Hand piece Lock.  
(See [5] 3. (7) 1) in this manual.)



**(2)Sterilization for:**

- Luna Vue ED Light: Handle Covers
- Vacuum Syringe: Tips and Body
- Three-way Syringe: Nozzle and Body
- Saliva Ejector: SE Nozzle and Body
- Dentist's Tray: Silicone Handle Cover

**1)Detachment of Autoclavable Components**

Refer to section [5] Operation in this manual.

**2)Autoclave Temperatures**

135°C(maximum). Please refer to belowing recommendation.

**<Recommendation condition of Autoclave Parts>**

Autoclave Parts	Temperature	Time
Vacuum Syringe VS90 Body/Chip	134°C	5mins
Vacuum Syringe VS14 Body/Chip	121°C	60mins
Saliva Ejector SE14S Body/SE Nozzle (disassembled)	134°C	5mins
Saliva Ejector SE90S Body/SE Nozzle (disassembled)	134°C	10mins
Threeway Syringe WS97 Body/Nozzle (disassembled)	134°C	10mins
Threeway Syringe WS201 Nozzle (disassembled)	134°C	10mins
Luna Vue ED Light/Dentist's Tray: Handle Cover	134°C	5mins

(for the gravity dehydration type autoclave)




**(3)Silicone Tray Sheet and Medicinal Bottle Holder**

**1)Autoclave Temperatures**

Recommence condition: 134°C, for 5min. (for the gravity dehydration type autoclave)



## 2. Alcohol Disinfection



 <b>CAUTION</b>	
	<p><b>Use only disinfects alcohol.</b> &gt;&gt;Other types of alcohol can cause discoloration or damage the material.</p>
	<p><b>Do not allow alcohol to seep inside the unit. Avoid openings around joints, shafts and switches. Do not use excessive amounts of alcohol.</b> &gt;&gt;Otherwise, there is a risk of electrical short-circuiting, and also a risk of malfunctions, material fatigue and material damage.</p>

Disinfect various components and surfaces by wiping with alcohol before and after treatment or as frequently as necessary. See the list for components and surfaces that should be disinfected by wiping with alcohol.

Refer to section [5]Operation in this manual for how information about how to detach components for cleaning.

See items (1) and (2) below for more information on disinfection by wiping with alcohol.

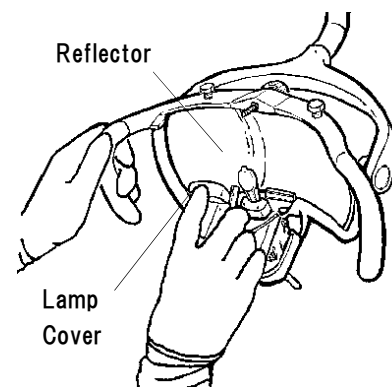
### (1)Operating Light Reflector Disinfection

 <b>WARNING</b>	
	<p><b>Refer to section [5] 13. (2) in this manual for information about handling the operating light.</b> &gt;&gt;Incorrect handling can result in the operating light being burned out by hot components, or injury to the user due to falling parts.</p>

- 1)Follow the instructions in section [5] 13. (2) in this manual to open the lamp cover.
- 2)Lightly wipe both the coated inside and back of the reflector with a piece of gauze or other soft material moistened with alcohol.

**ADVICE**

Do not touch the halogen lamp. Also, do not press down too hard on the inside coated surface of the reflector as doing so could cause the coating to peel off.





### (2)Other Parts and Components

Use a piece of gauze or other soft material moistened with alcohol to wipe other parts and components.

**ADVICE**

Do not soak up too much alcohol in the gauze.  
Wring the gauze out to remove excess alcohol.

### 3. Other Methods of Disinfection and Sterilization

 CAUTION	
	<p><b>Do not sterilize any components with dry heat.</b> &gt;&gt;Doing so could cause discoloration or damage the material, which may result in a malfunction.</p>
	<p><b>Do not soak, boil, or wash components with any chemical solutions such as benzene or thinner including disinfecting alcohol.</b> &gt;&gt;Doing so could cause discoloration or damage the material, which may result in a malfunction.</p>

#### (1)Sterilization and Disinfection Methods Not Mentioned

Methods of sterilization and disinfection not mentioned in this manual could damage instruments and components.

Contact your local dealer or J.Morita Corp. before using sterilization or disinfection methods that are not mentioned in this manual.

## 4. Basin Unit Component Disinfection and Cleaning

### ⚠ CAUTION



**Clean the items mentioned below at least once a day.**

>>Otherwise, the equipment could malfunction, its performance could deteriorate, or lines could become plugged.

### (1) Inside of Main Tubes for Vacuum Syringe and Saliva Ejector

Use the procedure below to clean these tubes after finishing with each patient:

- 1) Turn the main switch on.
- 2) Take the vacuum syringe and saliva ejector off their holders on the assistant's side and suck up one or two cups of water.
- 3) Return the instruments to their holders.

### (2) Cleaning the Vacuum Cut Filter

### ⚠ CAUTION

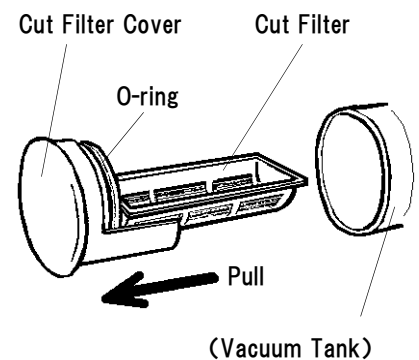


**Ensure the cover is correctly and firmly in place when you replace the filter after cleaning it.**

>>Otherwise the vacuum syringe and saliva ejector will not perform correctly, and there will be a risk of malfunctions or lines becoming plugged.

Follow the procedure below to clean the cut filter at least once a day:

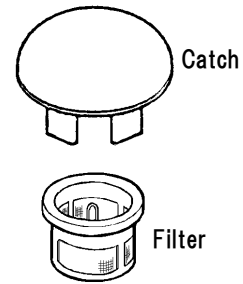
- 1) Open the door on the basin unit.
- 2) The cut filter is on the side of the top of the vacuum tank.  
Grip the cover and pull it straight out.
  - ADVICE** Do not let any solid matter inside the filter fall out.
- 3) Wash the filter and its cover in running water.
  - CHECK** Check the o-ring and replace it if it is damaged.
  - ADVICE** After washing, coat the o-ring with a little Vaseline so that the cover goes in and out smoothly.
- 4) Reverse the above procedure to replace the filter in its original position and put the cover securely back in place.
- 5) Close the door on the basin unit.



### (3)Cleaning the Basin Filter

Use the following procedure to clean the basin filter at least once a day:

- 1)First remove the catch and then take out the filter.
- 2)Wash the filter and catch in running water.
- 3)Reverse the above steps to replace the filter and catch in their original positions.  
Ensure the filter goes all the way in.

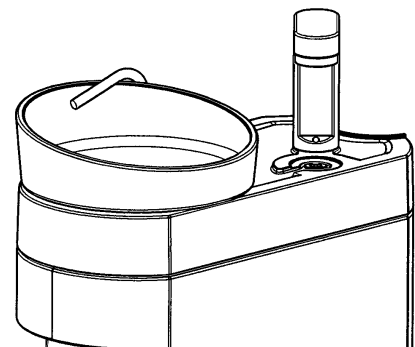


### (4)Cleaning the Basin

<b>⚠ CAUTION</b>	
<b>⊘</b>	<p><b>Do not use abrasive cleaning compounds, steel wool, stiff brushes or other similar solid utensils or implements.</b></p> <p>&gt;&gt;These cleaning methods could scratch the ceramic surface and allow chemical solutions to discolor the spittoon.</p>

Clean the inside and surrounding surfaces of the basin every day or as frequently as necessary. Refer to [5] 7. (5) 4) of this manual for information about how to remove the basin and its nozzle.

- 1)Use a sponge or soft cloth to apply the cleaner provided or a neutral detergent or disinfecting alcohol.
- 2)Then wipe the surface with a dry cloth to dry it and remove the cleaner or detergent.



### (5)Vacuum System Cleaning

Do this in between patients (several times a day).

### (6)Clean Out the Vacuum System

<b>⚠ CAUTION</b>	
<b>ⓘ</b>	<p><b>Use only cleaners recommended by J.Morita Corp. and follow the instructions that come with the product.</b></p> <p>&gt;&gt;Using inappropriate products or methods can damage tubes or other components and result in malfunctions, water leakage, loss of vacuum power and other problems.</p>

Clean out the vacuum system once a day or more frequently if necessary. Use the vacuum system cleaner recommended by J.Morita Corp. Follow the instructions that come with the cleaning product.

## 5. Flushing Out the Water System

### ⚠ CAUTION



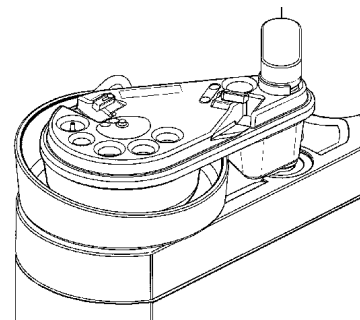
Flush out the water system in the way described below at least once a day before treatment. This is especially important if the unit has not been used for a day or more such as after a holiday.

>>The quality of water that has been sitting in the warmer tank or in the tubes will degrade, in quality and must be flushed out.

Flush out the various water systems everyday before treatment.  
Turn on the main switch and follow the procedure described below.

### (1)Using the Flushing Device\*

Set up the flushing bowl and flush out the various systems.  
Refer to section [5] 7. (1) 5) in this manual.



### (2)Not Using the Flushing Device

#### CHECK

Be sure to start from step 1) and follow the procedure exactly; otherwise the flushing procedure will not be performed efficiently.

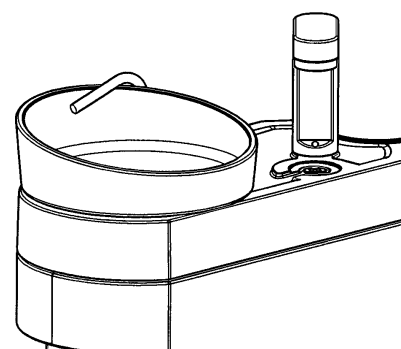
#### ADVICE

The times for flushing each system (see chart to the right) are predicated on the amount of water in the system. Longer flushing times are recommended to include the water in the main line leading to the treatment unit.

Estimated Flushing Times	
System	Time
Auto Filler	1min.
Three-way Syringe	
Air Turbine	
Micromotor	2min.
Ultrasonic Scaler	3min.

#### 1)Auto Filler Flushing

- Put a cup in place and fill it.
- Empty the cup and refill it. Repeat 8 times.
- The manual cup switch can also be used. In this case hold the switch down for 1 minute.



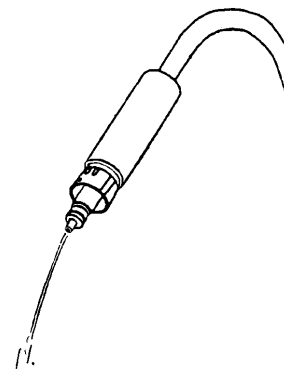
#### 2)Three-way Syringe Flushing

- Do both the dentist's and the assistant's at the same time.
- Hold the nozzles over the basin and run water through the syringes for at least 1 minute.

\*: Option

#### 4)Air Turbine

- a)Take the hand piece out of its holder and turn on the spray switch.
- b)Take the hand piece off its main tube.
- c)Hold the end of the tube (roto-quick connection) over the basin and step on the foot pedal. Run water through the tube for at least 1 minute.
- d)Finally reconnect the hand piece and return it to its holder.  
Repeat the above procedure for the second hand piece.



#### 5)Micromotor

- a)Take the motor out of its holder and turn its spray switch on.
- b)Connect an attachment that has a spray function.
- c)Hold the attachment over the basin and step on the foot pedal.  
Run water through the motor for at least 2 minutes.
- d)Finally return the motor to its holder.  
Repeat the above procedure for the second micromotor\*, if the unit is equipped with one.

#### 6)Ultrasonic Scaler \*

 **CAUTION**



**The hand piece must always be attached before the scaler is vibrated.**  
>>Otherwise, excessive loads will be applied to the circuit board and other components, and this could result in a breakdown or other malfunction.

- a)Take the hand piece out of its holder and turn on the spray switch.
- b)Hold the hand piece over the basin and step on the foot pedal.  
Continue to operate the instrument for at least 3 minutes.
- c)When flushing is completed, return the hand piece to its holder.

\*: Option

## 6. Cleaning Other Components and Surfaces

### WARNING



**Do not allow water, chemical solutions or alcohol to remain on the surfaces or inside the equipment.**

**Do not wash the switch panels or auto filler with water; the water could seep inside. If water, chemical solutions or alcohol accidentally get on or inside the equipment, turn off the main switch. Then dry the equipment off thoroughly.**

>>Otherwise, there is a risk an accident may occur due to a short circuit or damaged equipment such as discoloration, or damage to materials, which may lead to a malfunction.

### CAUTION



**Never use any type of cleaner except the one provided or a neutral detergent.**

>>Benzene, thinners, other types of solutions, or chemically treated cloths except for disinfecting alcohol could cause discoloration or other types of damage, which may result in a malfunction.

**Do not get floor cleaners or wax on the base or the foot pedal. If floor cleaner or wax happens to get on these components, wipe it off immediately.**

>>These substances could cause discoloration or damage the components resulting in a malfunction.

**Never splash water or cleaning solutions directly on the main switch.**

>>Doing so could cause a malfunction.



**If any chemical solutions are accidentally spilled on the instrument holder or tray, wipe them off immediately with a piece of gauze moistened with a little disinfecting alcohol. Take care that none of the alcohol seeps inside the unit.**

>>If the chemicals are not removed, they could cause discoloration or degrade the material.

## (1)Leather Seat and Back rest Surfaces

### CAUTION

**Avoid the following:****1)Contact with clothes or bags made of dyed leather or denim**

(colors could rub off, possible discoloration or degradation)

**2)Contact with PVC, steel, ABS wood, paint**

(possible discoloration or degradation, cracking)

**3)Printed matter such as newspapers or magazines, printed cloth**

(possible color transfer or soiling)

**4)Chemical solutions, Coloring agents, medical solutions, adhesives, tape etc.**

(possible damage, deformation, discoloration, degradation, hardening, softening)

**5)Bleaching Agents**

(possible discoloration, degradation)

**6)Direct or near contact with irons, stoves or other heat sources**

(possible damage, deformation, discoloration, degradation)

**7)Excessive rubbing of pressing on particular areas or spots**

(possible damage, deformation, discoloration, degradation)

>>Any of the above could be bad for the leather seat or the clothing, etc. that comes in contact with it.

Clean these surfaces as frequently as necessary.

1)Use a sponge or soft cloth to apply water, the cleaner provided, a neutral detergent, or alcohol\*\*.

2)Then wipe the surfaces with a dry cloth and completely remove all water, cleaner or detergent.

\*\* : Depending on the color, some leather seat and back rest covers may not be disinfected with alcohol. If necessary leather coverings can be replaced for a standard fee. Contact your local dealer or J.Morita Corp. for details.

## (2)Other Components and Surfaces

Refer to section [5] Operation of this manual for information about how to detach various components for cleaning.

1)Use a sponge or soft cloth to apply water, the cleaner provided or a neutral detergent.

2)Then wipe the surfaces with a dry cloth and completely remove all water, cleaner or detergent.



Once a Month

## 7. Vacuum Tank Inspection and Cleaning

### ⚠ CAUTION



**After cleaning ensure the vacuum tank and its flexible drain tube are correctly and securely installed and connected.**

>>Otherwise, the performance of the vacuum syringe or saliva ejector could deteriorate, these instruments could malfunction or their lines could get plugged up.

Use the procedure below to inspect the vacuum tank at least once a month and clean it if necessary.

This is not necessary if the unit is not equipped with a vacuum tank or an air vacuum.

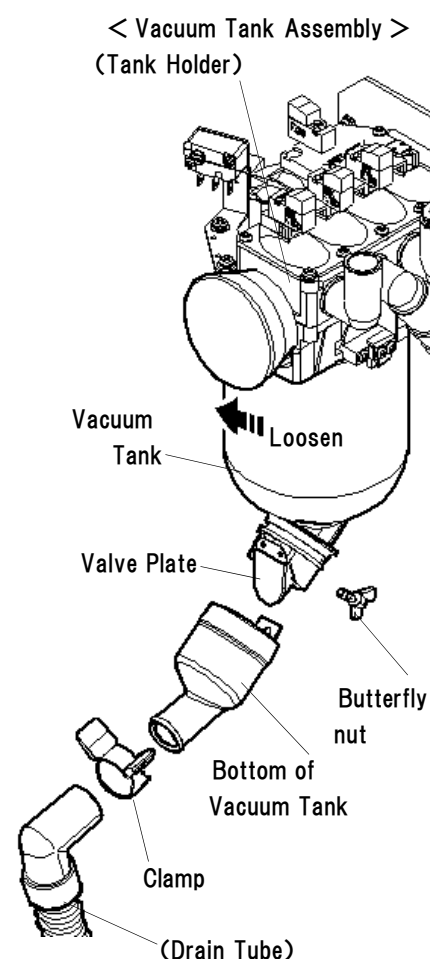
- (1)Open the door of Basin Unit.
- (2)Turn the tank to free it from its holder. Turn the tank to the left until the tab on the holder comes free and then pull the tank down to take it off.
- (3)Check whether the tank needs cleaning. If it does, go to step (4) below and clean it. If it doesn't skip to step (9) below.
- (4)Disconnect the drain tube from the bottom of the tank.  
Press on the tabs on the clamp to open it and then pull the tube off.
- (5)Wash the tank out with running water.
- (6)Wash the valve plate with running water. Loosen the butterfly nut on the bottom of the tank and take off the connector for the drain tube. Wash the front and back of the plate and around it.
- (7)Reconnect the drain tube in its original position. Clamp it securely in place.
- (8)Replace the tank on its holder. First line up the tank and its holder and then rotate the tank to the right until the tab on the side of the holder is in the "tight" position.
- (9)Close the door.

**ADVICE**




Watch out for water running out of the tube if it is tilted down.

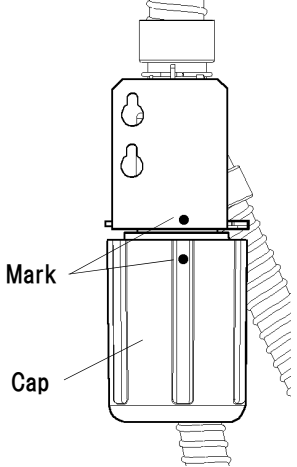
**CHECK**

Operate the vacuum to ensure it works correctly.



## 8. Clean the Drain Trap

 <b>CAUTION</b>	
	<p><b>Clean the drain trap at least once a month.</b>                      &gt;&gt;Otherwise performance could deteriorate, the vacuum could malfunction or the vacuum lines could get plugged up.</p> <hr/> <p><b>After cleaning ensure the drain trap filter, cap and sleeve are correctly and securely installed.</b>                      &gt;&gt;Otherwise drain water could leak resulting in damage or a malfunction.</p>
	<p><b>Please do not excessively tighten the cap of the drain trap.</b>                      &gt;&gt;Otherwise drain water could leak resulting in damage.</p>



Mark

Cap

Clean the drain trap at least once a month or whenever the basin does not seem to drain properly.

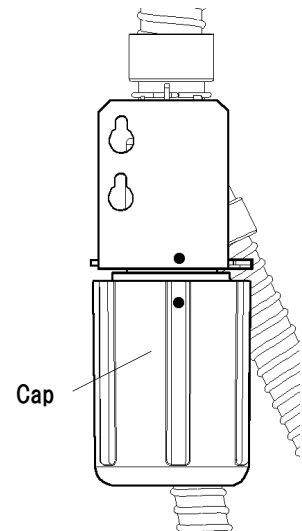
Follow the procedure below to do this.

- (1) Turn off the main switch.
- (2) Open the door of basin unit.
- (3) Unscrew the cap; turn to the left and take it off.

**ADVICE**

Be careful of the cap, otherwise water may begin leaking out.

Please a towel around it, just in case it leaks.



(4)Take out the drain filter.

Hold the small handle on the filter and pull it straight down.

(5)Throw away the drain water inside the cap and wash the cap, the drain filter and the sleeve with running water.

(6)Replace the drain filter in its original position.

Hold the small handle on the filter and push it all the way up into place.

**ADVICE**

Do not force the small handle on the filter back up inside the filter; this would make it difficult to remove.

(7)Replace the cap back over the sleeve in its original position.

Hold the cap level so that the threads are correctly lined up and then turn it clockwise until it is securely tightened up.

(8)Finally pour apporoximately 2 cups of water down the basin drain to fill up the trap.

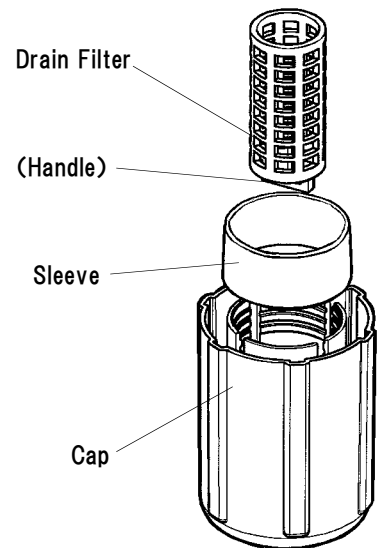
**ADVICE**

Filling up the trap keeps unpleasant odors from coming up through the drain.

**CHECK**

Ensure there is no leakage from the drain trap.

(9)Put the trap assembly back in place and close the door.



## 9. Inspect and Clean the Oil Drain Filter

At least once a month check the oil drain filter case on the back of the dentist's tray and see if it is full.

Follow this procedure to clean the filter and case if they are full of oil. Also check to see if the exhaust air for the air turbine is operating correctly.

**ADVICE**

Place a bucket underneath the case to catch the oil inside it.

(1)Take off the filter case and empty out the oil.Hold the top of the filter case and then turn the case itself to loosen it up.

**ADVICE**

Soak up the oil with absorbent paper and dispose of it according to regulations for flammable materials.

(2)Remove the oil drain filter and the top of the case.

Pull the filter off and then unscrew its support column.

(3)Wash all the components with running water and then completely dry and remove all remaining moisture. Replace the top of the filter case and the filter support column.

(4)Check the Exhaust Air for the Air Turbine.

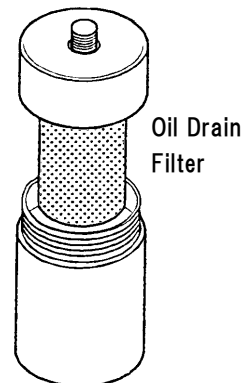
Operate each of the air turbine hand piece and hold your hand near the support column for the handpiece to see if air is coming out.

**CHECK**

If the exhaust air does not flow properly, stop using the hand piece and contact your local dealer or J.Morita Corp. More water will tend to mix with the exhaust air if the o-rings on the connection end of the air turbine hand piece are broken. Ensure these o-rings are in good shape.

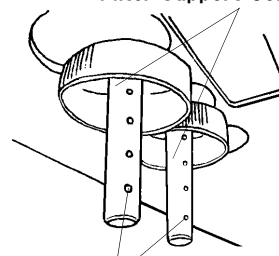
(5)If everything is in order, reassemble the filter and its case.

Filter Case Top



Filter Case

Filter Support Columns



Filter Support Columns  
Air Holes

**Once Every 6 Months**

## 10. Clean Vacuum Tank

### CAUTION



**Clean the vacuum tank at least once every 6 months.**

>>Otherwise, the vacuum could lose power, breakdown or the lines could become blocked.

**Ensure both the tank and its drain tube are properly and securely connected.**

>>Otherwise, the vacuum syringe and the saliva ejector could lose power, leak, breakdown, or their lines could plug up.







Clean the vacuum tank at least once every 6 months.

See [6] 7. of this manual.

The above step is not necessary if the unit is not equipped with a vacuum tank or an air vacuum.

Once a Year

## 11. Replacing the Bacteria Filters and their Cases

 <b>WARNING</b>	
	<p><b>Keep fingers clear of the electric panel and electrical components inside the plumbing pit and do not allow these parts to get wet.</b>  <b>Also, never move the chair while the plumbing pit is open.</b>                      &gt;&gt; Any of the above actions could result in an electric shock, short-circuiting, pinching or other injurious accidents.</p>
	<p><b>Before taking the filter cases off, be sure to release the internal pressure as described below.</b>                      &gt;&gt;Forcing the cases off could result in sudden breakage causing an injury.</p> <p><b>Ensure the pit housing is securely in place. After replacing the bacteria filters, unhook the housing and then replace it making sure it is securely and properly attached.</b>                      &gt;&gt;If the pit housing is not correctly attached, it could fall off resulting in an injurious accident. It could also result in equipment damage or abnormal noise.</p>
 <b>CAUTION</b>	
	<p><b>Do not mix up the air and water filters.</b>  <b>These filters do not work correctly if they are mixed up.</b>                      &gt;&gt;Ensure the filters and their cases are correctly and securely installed.</p>
	<p><b>Wear surgical gloves and other protective clothing when replacing the bacteria filters.</b>                      &gt;&gt;Used filters could be highly contaminated. Also touching new filters could impair their effectiveness.</p> <p><b>Replace both the filters and their cases at the same time once a year.</b>                      &gt;&gt;Otherwise performance could be degraded, lines could become blocked, and there is a risk of contamination. If the cases are not replaced at the same time, there is a risk of water or air leakage, or both.</p> <p><b>Ensure both the filters and their cases are securely and correctly installed. Slide the filters all the way onto their holder. Tighten the cases securely.</b>                      &gt;&gt;Otherwise, there are risks of water leakage, damage, and malfunction.</p>

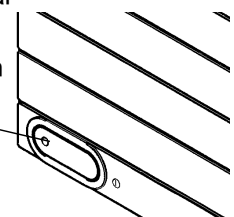
Raise chair as far as it will go and turn main switch off.

Green lamp goes out.

Replace the bacteria filters once a year. Use the procedure below to replace the filters.

(1)Raise the chair up as high as it will go and turn off the main switch.

Raise chair as far as it will go and turn main switch off.  
(Green lamp goes out)



(2)Open up the plumbing pit. Open the door on the basin unit and lift the housing up evenly. Then hook it on the pin inside the basin unit..

**CHECK** Ensure the housing is securely held up.

(3)Close the main water valve inside the basin unit and the main air valve inside the plumbing pit.

(4)Use the water and air from the three-way syringe to release the pressure in the air and water lines.

(5)Unscrew the filter cases inside the plumbing pit.

**ADVICE** The water filter case will be full of water and some water will drip out of its holder. Have a cloth ready to wipe up any water that spills out. Also have a bucket handy.

(6)Pull the old filters off their holders and replace them with new filters.

**CHECK** Before pull in the filters please do confirm the O-ring with right setting.

(7)Screw the new cases onto the holders. Tighten them up securely.

**ADVICE** Using excessive force or skewing the cases to screw them on could crack them.

(8)Check that there is no water or air leakage. Open each main valves, turn the unit on and operate the three-way syringe.

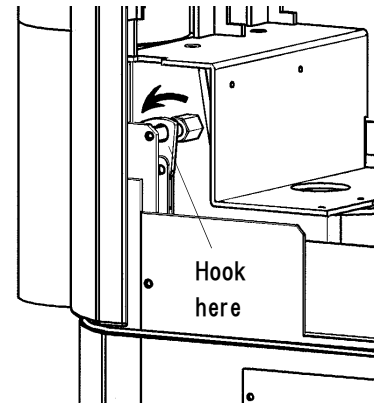
**CHECK** Ensure the air and water come out normally and that there is no leakage around the filter cases.

(9)Turn the main switch off and lower housing A back into its original position.

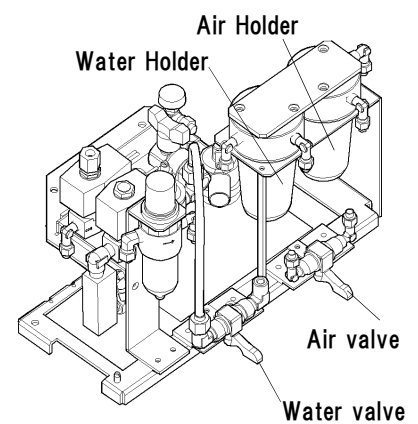
**ADVICE** Hold the housing securely before unhooking it and lower it carefully.

(10)Turn the main switch on and move the chair up and down to ensure the housing is correctly secured and in place.

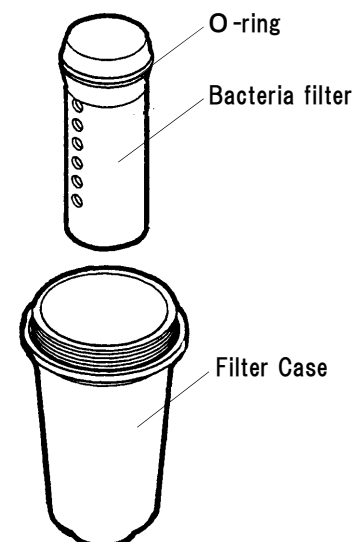
**ADVICE** There may be some air in the water lines right after replacing the filter. Run the auto filler or some thing else until the air in the lines is eliminated.






Lift up inner pit housing ↑



<Bottom of Basin Unit  
(Plumbing pit)>



## [7] Inspection

 <b>WARNING</b>	
	<p><b>For safety and optimum performance, inspect the equipment regularly and conscientiously according to the instructions in this manual.</b></p> <p>&gt;&gt;Otherwise there is a risk of accidents resulting in bodily injury or damage to equipment.</p>
	<p><b>If the equipment has not been used for some time, it should be carefully and completely inspected before use to insure its normal and safe operation.</b></p> <p>&gt;&gt;Otherwise there is a risk of accidents resulting in bodily injury or damage to equipment.</p>
	<p><b>If the equipment does not operate correctly or seems to be out of order, refer to [8]Troubleshooting on page 51 of this manual and consult your local dealer or J.Morita Corp.</b></p> <p>&gt;&gt;Haphazard disassembly, repair or modification could be extremely dangerous.</p>
	<p><b>Regularly inspect and clean the main plug and socket connection (including the ground connection).</b></p> <p>&gt;&gt;A build-up of dust and other debris on and around this connection creates the risk of fire, electric shock and other accidents.</p>
	<p><b>No modification of this equipment is allowed.</b></p> <p><b>Do not modify this equipment without authorization of manufacturer.</b></p> <p><b>If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of the effect.</b></p> <p>&gt;&gt;Haphazard disassembly, repair or modification could be extremely dangerous.</p>

For instruments such as the micromotor, scaler, etc.and for devices such as the operating light, visible light cure etc., refer to the separate user manuals for these devices and the list below.

### 1. User Daily Inspection

The inspections listed in the chart should be performed every day before using the equipment.

If any problems without simple remedies are found, contact your local dealer or J.Morita Corp.



**■ Inspect these items every day before using the equipment:**

No.	Inspection Item	Response or Remedy	Reference
1	Check for loose or wobbly chair, light arm, basin unit, seat, instrument holders etc.	Adjust or tighten.	[4] [5]13.
2	Check for obstacles beneath the seat and around the chair.(See CAUTION at the beginning of section [5].)	Remove any obstacles and create a clear area around the equipment.	[5] (CAUTION)
3	Check that chair emergency stop works properly. (See section [5] 3. (2) of this manual.)	Check that chair emergency stop and safety switches work properly.	[5]3.(2)
4	Check for drain, air, water and gas leakage (look for wet spots or stains and listen for the sound of escaping air)	Check all connections and repair if necessary.	[4] [5]10. [6]11.
5	Check the base and plumbing pit housing for scrapes, correct installation, tilting, and abnormal noise.	Inspect visually and by moving the chair.	[6]11.
6	Ensure the foot control, panel switches, air turbine, micromotor ultra sonic scaler and the other instruments all work normally.	Test each instrument by operating it to ensure changeover,display and operation are all normal. Also check the Clean System.	[5]2. ~6.
7	Ensure various functions and equipment such as the auto filler, basin, gas burner and interlock work properly.	Check that these work properly, are correctly adjusted, and run for the specified time.	[5]7. [5]8.

**◆ Inspect these items everyday after using the equipment:**

No.	Inspection Item	Response or Remedy	Reference
1	Ensure the main switch is off.	Turn off the main switch.	[5]17.

## 2. Standard Periodic Inspections

In addition to the daily inspections listed on the previous page, perform the following inspection once every 6 months.

If any problems or abnormal conditions are found, contact your local dealer or J.Morita Corp. to resolve the problem as soon as possible.

### Main Dental Treatment Unit and Chair

No.	Item	Description	Record	
1	Power Supply Voltage	Use digital or analog tester. Specified standard voltage range: AC 220 / 230 / 240 V 10%		
2	Floor and Base	Check that the floor is level and that the base of the unit has not loosen up or gotten wobbly.		
3	Manual operation of Seat and Back rest	Use the levers on the foot control to move the seat and back rest. Repeat 3 times.		
4	Auto-Positioning	Use the auto-positioning switches to set the chair in each auto position. Repeat 3 times.		
5	Emergency Stop for Auto-Positioning	Test emergency stop procedures while the chair is while auto-positioning is being carried out. Repeat 3 times. (Refer to the operator's manual for the various emergency stop procedures.)		
6	Head rest	Check the head rest's movement (both angle and slide bar). (Refer to the operator's manual for adjustable parts.)		
7	Electronic circuitry and wiring	Check the printed circuit boards, electrical components and elements for: 1. loose connections, 2. frayed insulation 3. broken or bent leads.		
8	Air, Water and Hydraulic Lines	Check all water, air and hydraulic lines for: 1.loose connections, 2.wobbly connections 3.broken, bent, or pinched lines, and 4.cracks.		
9	Seat and Back rest Installation	Check for: 1.looseness, 2.wobble and 3.squeaking or grating noise.		
10	Screw and outer cover tightness	Check all screws, bolts and housing for: 1. looseness, 2.wobble, and 3.missing screws, bolts or other parts, 4.scrapes, tilting, scratches, bending		
11	Internal cleanliness	Look for dirt, dust or other contamination inside the unit and clean it as necessary.		
12	Quantity of oil	When the chair is in the reset position(Chair height: lowest, Backrest angle: 70° ), quantity of oil shall be 30mm or more from the bottom of the oil tank.		

### Air Turbine Handpieces

13	Hand piece connections	Check and repeat 3 times: 1. handpiece detachment and attachment. 2. Handpiece does not come off when given a light tug.		
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No.	Item	Description	Record		
Air Turbine Hand piece	14	Air Pressure	Operate the hand pieces and check the pressure gauge on the back of the tray. (Refer to the hand pieces' operation manuals for the correct pressure reading.)		
	15	Water and air connections and lamp.	Check the main tube connection and exhaust air line for: 1) Air leakage, 2) Water leakage, 3) Insufficient spray, 4) Burned out lamp, 5) Defective wiring and electrical connections, 6) Insufficient exhaust air.		
Micromotor	16	Micromotor Operation	Check for: 1) Correct attachment connection 2) Correct rotation and variable speed control 3) Correct forward/reverse and speed range changeover 4) Worn clutch or other replaceable components		
	17	Air, water, electricity and lamp	Check tube connection and various lines for: 1) Air leakage, 2) Water leakage, 3) Insufficient spray, 4) Burned out lamp, 5) Defective wiring and electrical connections.		
> O \ SW	18	Vacuum Syringe and Saliva Ejector	Check: 1) Syringe and ejector suction start and stop, 2) Tip and SE nozzle attachment, 3) Leakage at main tube connection, 4) Vacuum tank float switch operation.		
> S	19	Three-way Syringe	Check: 1) Correct delivery of air, water, and spray, 2) levers do not wobble or twist 3) leakage at main tube connection.		
Basin	20	Auto Filler	Check: 1) Water starts automatically when cup is put in place, 2) Water stops when water in cup reaches correct level, 3) Sensor is not dirty, scratched or damaged.		
	21	Snap On Water and Air Connectors	Check: 1) Connector can be properly connected and disconnected, 2) There is no leakage at joint, 3) Water and air are correctly delivered.		

### 3. Replacement Parts List

For optimum performance and safety, use the list below to replace parts that wear out in the course of normal use.

Contact J.Morita Corp. or your local dealer to order parts.

It may not be possible for J.Morita Corp.to supply parts for units more than 10 years old.

#### Signo Treffert Replacement Parts List

No.	Part Name	Freaquency	Replacement Instructions
1	Bacteria Filters (water and air)	Every year.	See [6] 11.
2	Cases for bacteria filters		
3	Halogen Lamp for Luna Vue ED Light	Whenever it burns out or seems to be too dim.	See [5] 13.
4	Fuses		See [5] 18.
5	Various O-rings Cut Filter Cover and other parts	Whenever one blows or because of poor performance.	Contact your local dealer or J.Morita Corp.
6	Gaskets for valve plate, diaphragm etc.		
7	Filters Cut filter etc.		
8	Main Tubes Air turbine, vacuum syringe, etc.	Whenever these are worn out or dirty or because of poor performance.	
9	Tubing Flexible tubes etc.		
10	Valves WS valve case etc.		
11	Autoclavable parts (see[6] list )		
12	Disposable items Paper cups and caps etc.	Whenever supply runs out.	
13	Hydraulic Oil	Whenever supply runs too low	
14	Leather covering for seat, back rest, head rest, etc.	Whenever these are cracked, worn out or dirty	

## [8]Troubleshooting

Use the chart below to solve operational problems.

Contact J.Morita Corp. or your local dealer if the problem cannot be solved by following the chart below or for malfunctions and defects not mentioned in the chart.

### Check this list before requesting repairs

Problem	Possible Cause	Response
No power when main switch is turned on. (Switch does not light up.)	1)Pug and socket inside plumbing pit are not connected. 2)Blown fuse.	1)Connect plug and socket. 2)Replace fuse.
Seat or back rest does not move.	1)Emergency stop activated. 2)Temporary malfunction due to electrical noise, etc.	1)Remove obstacles etc. to cancel emergency stop. 2)Turn main switch off and then back on again.
Back rest moves when foot pedal is depressed.	Attempt to over-ride the emergency stop.	Remove any obstacles etc. and release emergency stop.
Panel switches do not work at all.	Interlock inside basin unit has been activated.	Turn lock OFF.
Panel switches do not work correctly. (cannot changeover, etc.)	1)Pressing another switch simultaneously. 2)Another switch is being held down.	1)Press only one switch at a time. 2)Check all switches on the panel.
Micromotor does not rotate.	Fuse on motor's printed circuit board is blown.	Replace fuse.
Dentist's instrument does not work.	Hand piece lock is activated.	See if hand piece lock is activated. Release if necessary.
No suction or weak suction for vacuum syringe or saliva ejector.	1)Cut filter or vacuum tank need cleaning. 2)Cut filter or vacuum tank is not correctly connected. (Connection is not tight enough.)	1)Clean filter or tank. 2)Connect all components properly.
Basin does not drain properly.	Basin filter and Drain filter needs cleaning.	Clean Basin filter and Drain filter.

## **[9]Warranty and Repairs**

### **1.Product Warranty**

If the product malfunctions while being used correctly as described in this manual, it will be repaired and components replaced free of charge during the period and within the range specified on the purchaser's warranty (separate document). Refer to the back of the warranty for details.

### **2.Warranty Registration**

After purchasing the product, fill out the customer's warranty, give a copy to the dealer and keep a copy for yourself.

### **3.Repairs**

#### **(1)During Warranty Period**

Present the warranty and make your repair request to the source of the purchase or your nearest Morita dealer. Repairs will be carried out free of charge. However, the user may have to bear the expense of components not covered by the warranty such as parts that normally need to be replaced periodically.

#### **(2)After the Expiration of the Warranty Period**

Make your repair request to the original sales outlet or your nearest Morita dealer. If the product can be restored to normal operating condition by repairs and parts replacement, the owner will bear the cost of repairs.

### **4.Replacement Parts Availability Period**

Replacement parts will be available for at least 10 years after the manufacture of the product is discontinued. However, after this period replacement parts may no longer be available and repairs may not be possible.

## [10]Disposal of Medical Devices and Equipment

### 1. Disposal of this equipment and its components

This equipment including its various components and replacement parts is deemed to be medical equipment.

Any medical devices that could possibly be contaminated must be first decontaminated by the dentist or medical institution responsible and then be disposed of by an agent licensed and qualified to handle medical and industrial waste.

Even devices and equipment that is not considered to be a contamination risk must be disposed of according to local laws and regulations.

**[11]Specifications**

General Designation	Dental Treatment Unit
Name	Signo Treffert
Model	TU97
Classification	Regulated Medical Equipment (Special Maintenance and Installation)
Rating	220/230/240V AC
Frequency	50/60 Hz
Power Consumption	1.5 KVA
Weight of Main Unit	Approx. 240 Kg (with over-arm and step)
Load Weights	Seat: approximately 1350N (135kg) Back rest: approximately 800N (80kg)
Seat Elevation Mechanism	Hydraulic Vertical Elevator
Seat Height	750 +20, -0mm (max.) 450 +20, -0mm (min. )
Back rest Angle	Raised : 78° ± 10° Lowered : 2° ± 10°
Electric shock Protection	Class I (permanent installation) Type B with applied device
EMC Standard	Conforms to IEC60601-1-2:2007

Water Pressure	0.20 to 0.59 MPa
Air Pressure	0.39 to 0.78 MPa
Three-way Syringe Output	Water and Spray: 30ml / 15sec., minimum
Vacuum Syringe Performance	Volume: 140 l / min., minimum (with EV-12 Type II) Vacuum Degree: 11.97kPa, minimum (with EV-12 Type II)
Maximum Electrical Load	Warmer Tank : 190W Three-way Syringe Tube:20W
Maximum Permissible Load	Foot Control Main Pedal:135kg
Liquid Invasion	Foot Control IP X 1
Operation Cycles	Chair: 50sec. ON, 5min. OFF
	Penviewer Intra-oral camera: 50sec. ON, 5min. OFF
	Other portions: Continuous Operation
Type B applied parts	Seat, Head Rest, Back Rest, Arm Rest, Instruments



**Regarding the danger related to electromagnetic interference and other kinds of interference.**

1.

This product may malfunction in environments subject to electromagnetic interference.

Installing devices around communication equipment and the apparatus that generate electromagnetic waves, such as an elevator, is not permitted.

Moreover, do not use devices that generate electromagnetic waves, such as a portable telephone, around this product.

2.

This product may be influenced by an electric scalpel.

If you use an electric scalpel, do not turn on the main switch of this product.

**Regarding environmental conditions at the time of transportation and storage.****1.Storage method**

(1)Temperature:-10-70 degrees°C

(2)Humidity:10-85 RH%

(A location where dew does not form)

(3)Atmospheric pressure:700-1660 hPa

**2.Cautions and matters of concern**

(1)Keep it in a location that does not require water.

(2)Keep it in a location that will not be affected by air, containing dust, salt, sulfur, etc.

(3)Do not keep the device in a location that may be subject to the effects of an inclined base, vibration or shock.(including when it is moved)

(4)Do not keep the device in a location that may be affected by chemicals or gases.

**3.Durable period**

The lifespan of this product will be 10 years from the date of manufacture provided regular maintenance checks are carried out.

**TU97 EMC technical description****Guidance and manufacturer's declaration-electromagnetic emission**

The TU97 is intended for use in the electromagnetic environment specified below.

The customer or the user of the TU97 should ensure that it is used in such an environment.

<b>Emission test</b>	<b>Compliance</b>	<b>Electromagnetic environment-guidance</b>
RF emissions CISPR 11	Group-1	The TU97 users 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 TU97 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.
Harmnic emissions IEC 61000-3-2	Class-C	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

**Guidance and manufacturer's declaration-electromagnetic immunity**

The TU97 is intended for use in the Electromagnetic environment specified below.  
The customer or the user of the TU97 should ensure 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	± 6KV contact ± 8KV air	± 6KV contact ± 8KV 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 61000-4-2	± 2KV for power supply lines ± 1KV for input/output lines	± 2KV for power supply lines ± 1KV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1KV differential mode ± 2KV common mode	± 1KV differential mode ± 2KV 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% Ut (>95% dip inUt) for 0.5 cycle 40% Ut  (60% dip inUt) for 5 cycle 70% Ut  (30% dip inUt) for 25 cycle <5% Ut  (>95% dip inUt) for 5 sec	<5% Ut (>95% dip inUt) for 0.5 cycle 40% Ut  (60% dip inUt) for 5 cycle 70% Ut  (30% dip inUt) for 25 cycle <5% Ut  (>95% dip inUt) for 5 sec	Mains power quality should be equivalent to that of a typical commercial or hospital environment. If the user of the TU97 requires continued operation during power mains interruptions, it is recommended that the TU97 be powered from an uninterruptible power supply or battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	The power frequency magnetic field should be at least characteristic of a typical location in a typical commercial or hospital environment.

NOTE: Ut is the a.c. mains voltage prior to application of the test level

**Guidance and manufacturer's declaration-electromagnetic immunity**

The TU97 is intended for use in the Electromagnetic environment specified below.

The customer or the user of the TU97 should ensure 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	3Vrms 150KHz to 80MHz	3Vrms 150KHz to 80MHz	Portable and mobile RF communications equipments should be used no closer to any part of the TU97, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. <b>Recommended separation distance</b> $d = 1.17 \times \sqrt{P}$ $d = 1.17 \times \sqrt{P}$ 80MHz to 800MHz $d = 2.33 \times \sqrt{P}$ 800MHz to 2.5GHz 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 meter(m).  Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey.(a) should be less than the compliance level in each frequency range.(b)  Interference may occur in the vicinity of equipment marked with the following symbol. <div style="text-align: center;">  </div>
Radiated RF IEC 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m 80MHz to 2.5GHz	

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

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

(a) Field strengths from fixed transmitters such as base stations for radio (cellular /cordless)telephones and mobile radio, 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 TU97 is used exceeds the applicable RF compliance level above, the TU97 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary. Such as reorienting or relocating the TU97.

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

**Recommended separation distances between  
Portable and mobile RF communications equipment and the TU97**

The TU97 is intended for use in the Electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the TU97 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the TU97 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]		
	150KHz to 80MHz $d = 1.17 \times \sqrt{P}$	80MHz to 800MHz $d = 1.17 \times \sqrt{P}$	800MHz to 2.5GHz $d = 2.33 \times \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	3.7	3.7	7.4

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters(m) can be estimated using the equation applicable to 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 80MHz 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 absorption and reflection from structures objects and people.

**System sentence**

Additional equipment connected to medical electrical equipment must comply with the respective IEC or ISO standards(e.g.IEC 60950 for data processing equipment). Furthermore all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of the 3Ed. of IEC 60601-1,respectively).

Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, consult your rocal representative or the tecnical service department.

Sources:

-IEC 60601-1:2005:7.9.2.5,8.1,16.2.d

-MDD 93/42/EEC:Annex I clause 13.6.c.



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