



TU110(EX)-X,01B. 2019.9.TO

Operation Manual

Model

Dental Treatment Unit

SIGNO
T Y P E **G20**

Model TU110

Thank you for purchasing the SIGNO TypeG20.
For optimum safety and performance, read this manual thoroughly before using the unit and pay close attention to the warnings and cautions.
Keep this manual in a handy place for ready reference.

J.MORITA TOKYO MFG.CORP.

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* * *

Attention

1. 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 not authorized by the manufacturer.
 - 2) Use of parts or components other than those specified by the manufacturer and in their original condition.
 - 3) Repairs,maintenance,modifications etc. using supplementary components other than the operating procedures described in this manual or resulting from not following the cautionary remarks and warnings in this manual.
 - 4) Operating the equipment in ways other than the operating procedures described in this manual or resulting from not following the cautionary remarks and warnings in this manual.
 - 5) Workplace conditions and environment or installation conditions which do not conform to those stated in this manual.
 - 6) Fires,earthquakes,floods,lightning, natural disasters, or acts of God.

2. 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 dentists and dental technicians who are legally qualified to do so.












3. 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 insure safe operation and prevent injuries, accidents and damage.



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

SAFETY SYMBOLS CHART	
 WARNING	This indicates the possibility of serious bodily injury or death and serious damage occurring if the safety instructions are not followed.
 CAUTION	This indicates the possibility of minor bodily injury or damage occurring if the safety instructions are not followed.
Symbols	 This symbol indicates a WARNING or CAUTION instruction.
	 This symbol indicates an operation or procedure that MUST NOT be performed.
	 This symbol indicates an instruction that MUST BE followed.
	 This symbol indicates a warning for high temperatures that MUST BE followed.
	 This symbol indicates an instruction a pay attention to dangerous voltage.
	 This symbol indicates the B type cavity that MUST BE followed.
	 This symbol indicates "turned on" of the main switch.
	 This symbol indicates "turned off" of the main switch.
	 This symbol indicates that reference to the operation manual is required.



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 help the operator use the equipment more easily.

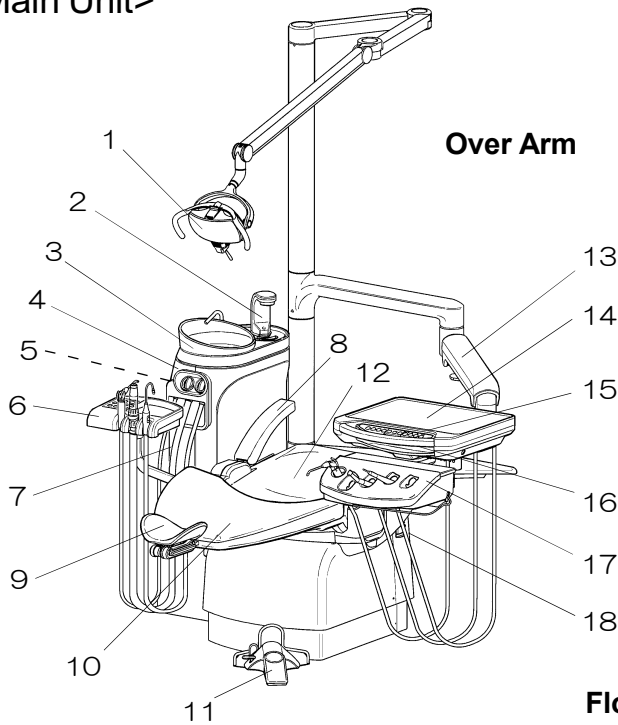
Advice and Hints Symbols Chart	
 ADVICE	Indicates advice concerning operation.
 CHECK	Indicates points which should be checked during operation.

3. Operational Purpose of Equipment

 WARNING	
	<p>The SIGNO Type G20 is a dental treatment unit and must not be used for any other purpose.</p> <p>>>Use for any purpose not designated is dangerous and could result in accidents or damage to the equipment.</p>

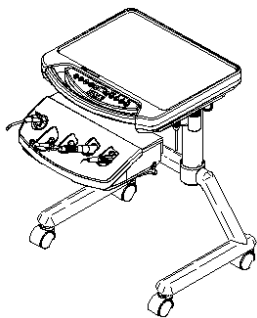
[2]Parts Identification

<Main Unit>

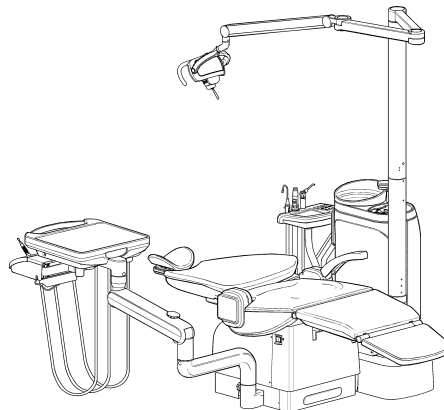


No	Parts
1	Operating Light
2	Auto Filler
3	Basin
4	Basin Unit
5	Water Snap-on Connection
6	Assistant's Instrument Holder
7	Basin Unit Door
8	Assistant's Side Arm Rest
9	Headrest
10	Backrest
11	Foot Control
12	Seat
13	Tray Arm
14	Dentist's Tray
15	Dentist's Switch Panel
16	Tray Handle
17	Dentist's Instrument Holder
18	Main Switch

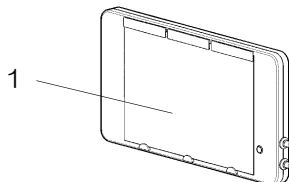
Cart Type



Floor Arm



<Options>



No	Parts
1	Triple Film Viewer

<Accessories>

- 1)Tray Paper :1Package
- 2)Paper Cups :1Package
- 3)Star Caps for Paper Cups :1Package
- 4)Waste Container Stand :1
- 5)Head Rest Cover :1
- 6)Extra Fuses :1set
- 7)Exclusive cleaner :1
- 8)Operation Manual :1



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

Also parts and components for the instruments selected.


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

[3]Installation

WARNING

	<p>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.</p> <p>>>Otherwise, there is a risk that an accident or damage to equipment may occur.</p>
	<p>The unit must be fastened and fixed to the floor securely as specified in the installation manual.</p> <p>>>Otherwise, the chair could fall over resulting in injury or damage.</p>
	<p>The equipment MUST NEVER be connected to an electrical supply source that does not have the specified voltage, current, frequency and power characteristics. Each unit must have its own devoted electrical circuit connection and should not share a circuit with other units or other types of equipment.</p> <p>>>Otherwise, short-circuiting or overheating may result in injury or damage.</p>
	<p>Never splash the equipment with water or place it in an area where it could get wet.</p> <p>>>This will create the danger of short-circuiting or overheating, which may result in injury or damage.</p>
	<p>Do not install the unit in an area where chemicals are stored or where gas could be released.</p> <p>>>This would create the danger of fire or electric shock resulting in injury or damage.</p>
	<p>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.</p> <p>>>This would create the danger of short-circuiting and electric shocks, which may result in injury or damage.</p>

CAUTION

	<p>Do not tilt the equipment or place it in an unstable position; do not expose it to excessive vibrations, bumps or shocks.</p> <p>>>Doing so could cause it to malfunction or damage it.</p>
	<p>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.</p> <p>>>Any of the above conditions could cause the equipment to malfunction or damage it.</p>
	<p>The unit must be installed in a room appropriate for dental treatment.</p> <p>>>If the installation location is not suitable, the unit may not only fail to perform optimally, but it could malfunction as well.</p>
	<p>Please take note of the following system requirements:</p> <p>1) Temperature : 10~40°C 2) Humidity : 30~75%RH (not be dewy) 3) Air pressure: 700~1060hPa</p> <p>>>Deviation from any of the above conditions could cause the equipment to malfunction or result in damage.</p>

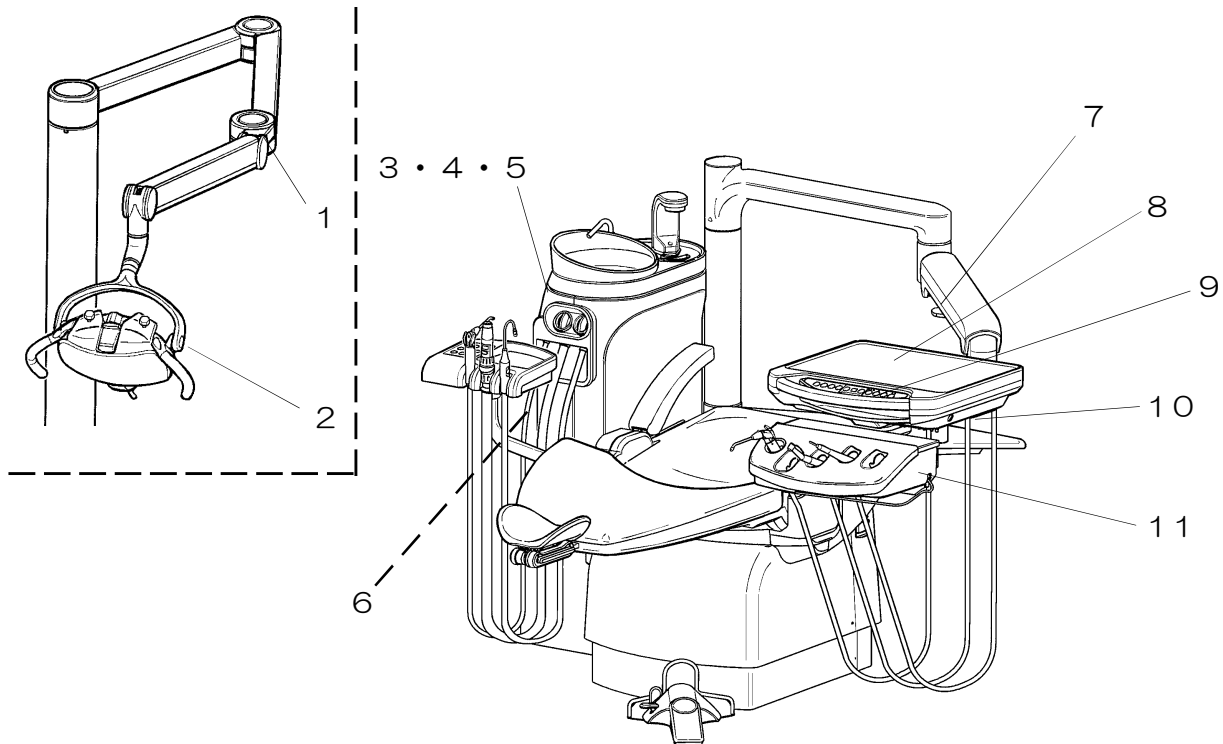
[4]Preliminary Adjustments and Connections

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	☆	7	Tray Arm Motion	9(1)
2	Light Head Movement	☆	8	Tray Arm Angle	☆
3	Auto Filler Water Volume	8(1)	9	Auto Position	3(1)
4	Warmer Temperature	7(2)	10	Instrument Air and Spray Volume	6(11)
5	Water Volume for Snap On Connection	7(3)	11	Dentist's Instrument Holder Angle	☆
6	Three-way Syringe water Temperature	6(4)			

☆ :Installation manual

2. Instrument Connections

CAUTION



Before using the equipment, connect all the main instrument tubes. As for the threeway syringe, connect the syringe body as well as the tube.(except for the one-touch detachable WS90,option).

>>Otherwise, air or water could leak out.

All instruments must be in their specified holders except when in use.

>>Otherwise, an injury or damage could result from using the vacuum syringe or some other instrument.

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: The Installation manual.

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

>>Vacuum Syringe and Saliva Ejector: Section [5] 5. (7) and (8) of this manual

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

3. Install the Filters

CAUTION



All the filters must be installed before the equipment is used.

>>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.



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.

For your information, filter specification differs according to your selection of optional equipments.

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

[5]Operation**⚠ WARNING**

	<p>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.(See “Illustrated Guide to Cautionary Points”)</p> <p>>>Otherwise, fingers or other body parts could be pinched resulting in injury or damage.</p>
	<p>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.</p> <p>>>These actions could cause the equipment to fall over resulting in injury or damage.</p>
	<p>Do not spill fluids or place flammable or metal objects inside the equipment.</p> <p>>>This could result in injury or damage due to fire, electric shock or other accidents.</p>
	<p>Avoid accidents that could result in bodily injury or equipment damage by paying attention to the points listed below:</p> <p>Ensure the equipment is only used by specified and qualified operators.</p> <ol style="list-style-type: none"> 1)Do not allow anyone to operate the equipment randomly or play with it. 2)Keep an eye on the patient at all times. 3)Do not let patients assume risky positions (legs sticking out, standing on seat, sitting with their legs folded under them etc.) 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.) 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.) 6)Only one person at a time should occupy the seat; do not allow children to sit with their mother or father during treatment. 7)Do not allow people especially children to loiter or play near the chair. 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.) 9)Avoid any other actions that seem dangerous. 10)Avoid any other conditions that seem dangerous. <p>>>Not paying sufficient attention to the above points could result in injury or damage.</p>
	<p>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:</p> <ol style="list-style-type: none"> A)Step on the foot panel B)Operate any of the manual positioning levers on the foot control. (Operating the leaves for the seat or back rest, up or down, will all stop the chair.) C)Turn the main switch off. <p>>>Not taking timely action to stop the chair could result in injury or damage.</p>

 **CAUTION**



If a patient uses a pacemaker, do not use the ultrasonic scaler and electrocautery scalpel at the same time.

>>There is a risk of health problems due to malfunction of the pacemaker.

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 lead to abnormal operation.

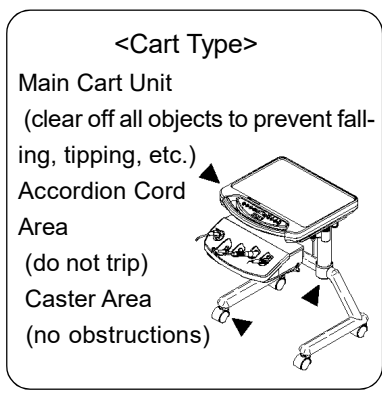
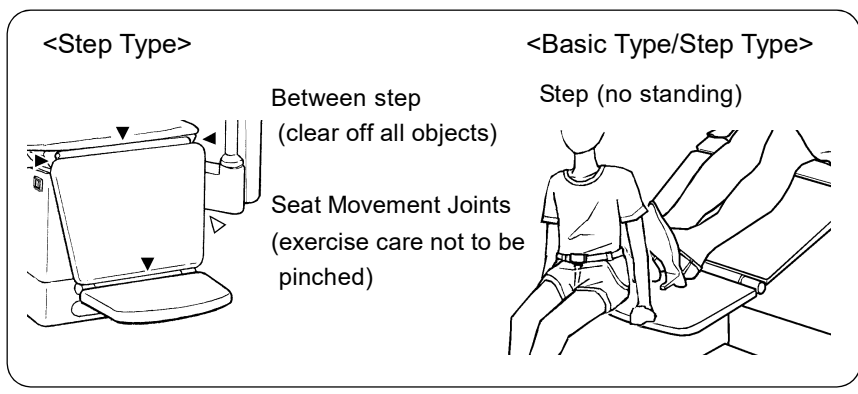
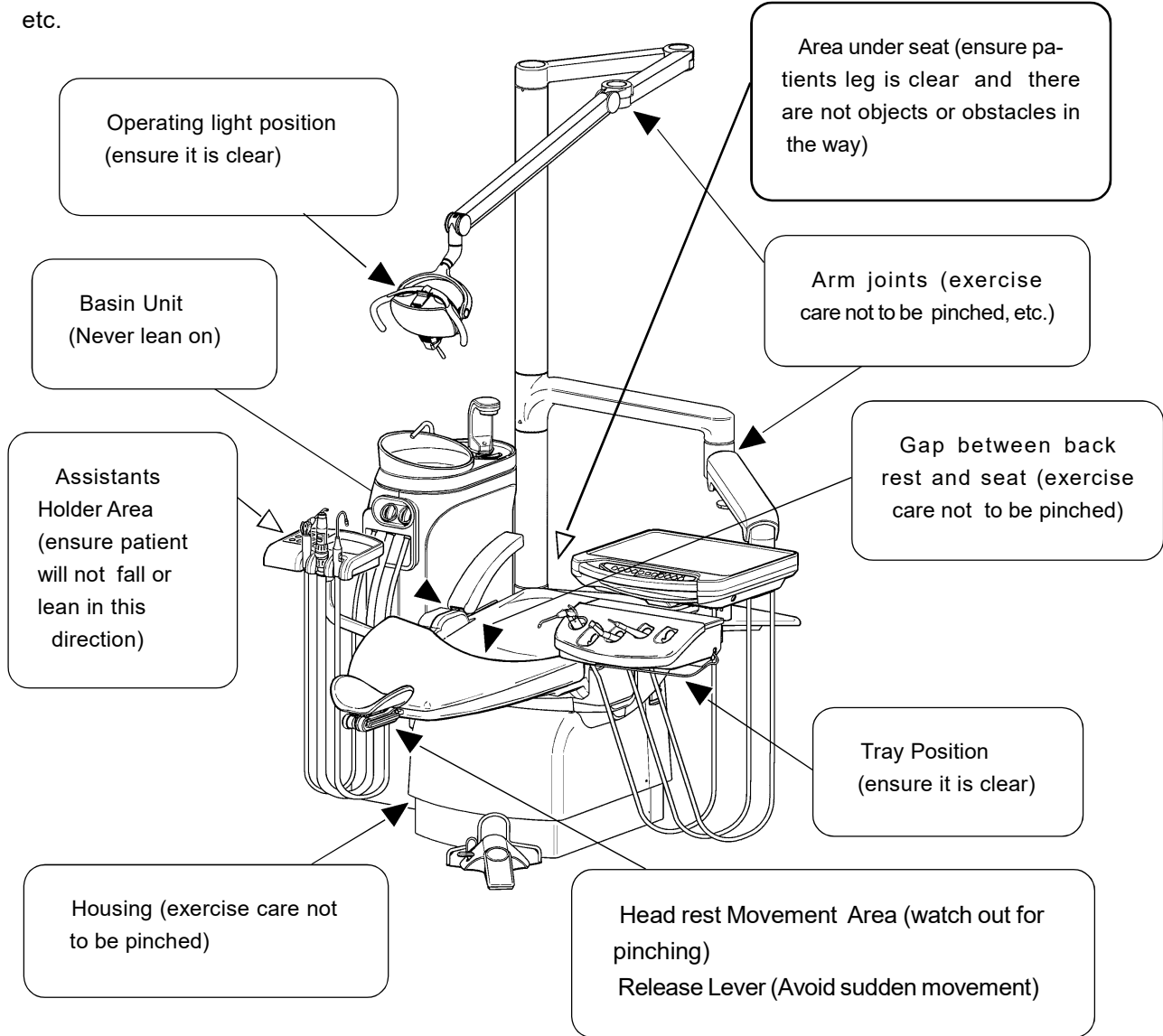
◆ Illustrated Guide to Cautionary Points

(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



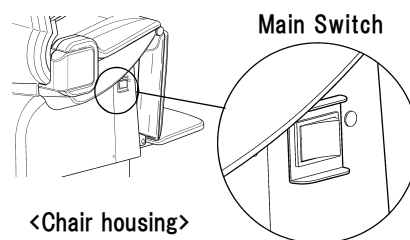
1. Main Switch

 CAUTION	
	<p>Never bump or bang the equipment or expose it to excessive vibration while the main switch is on.</p> <p>>>Doing so could cause an accident resulting in injury or damage.</p>
	<p>Always turn the main switch off after treatment, during breaks in treatment or whenever the unit is not in actual use.</p> <p>>>Otherwise, an accident could occur resulting in injury or damage.</p>
	<p>Turn the main switch off before using an electric scalpel in the immediate vicinity of the equipment.</p> <p>>>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>

When starting the operation of the dental treatment unit, open the air and water supply valves, (See section [5]18 in this manual) and then turn on the main switch.

(1)Operation

The main switch is located on the lower part of the housing. Press it to turn the unit on. The lamp 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.

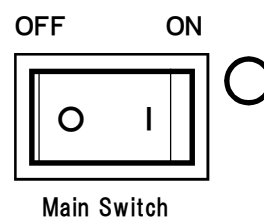
In the save power mode,

>>The operating light goes out.(When equipped with Auto light*)

>>The operating light and its indicator go out.

>>The power for chair operation

>>The water is turned off.



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

Time to save power mode can be changed.(60 or 120 minutes) Please contact the dealer whom you purchased the dental treatment unit from or a nearby J.Morita Corporation if you would like to change the setting.

2. Foot Control

⚠ CAUTION



Please do not assume any dangerous positions when riding on the foot control, foot pedal or operation levers.

>>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.

Please restart use after moisture has been wiped off with the main switch turned off, and after it has dried naturally.

>>Not observing the above could result in injury, damage, electric shock or other accidents.

Never place a load greater than 10N (1kgf) on the foot control, foot pedal or operation levers.

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

Please do not place the foot control on an incline or upside down.

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

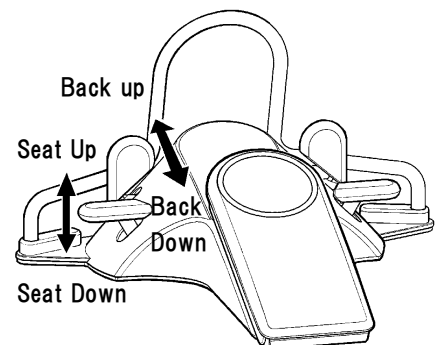
(1)Manual Chair Operation Levers

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.



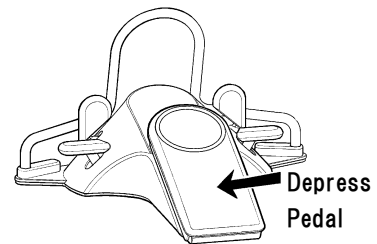
(2)Foot Pedal

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.



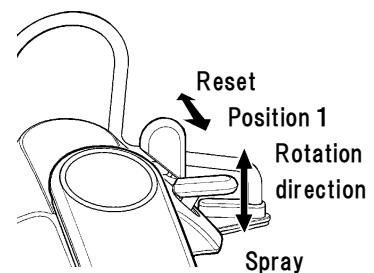
(3)Extended Function Levers*

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.



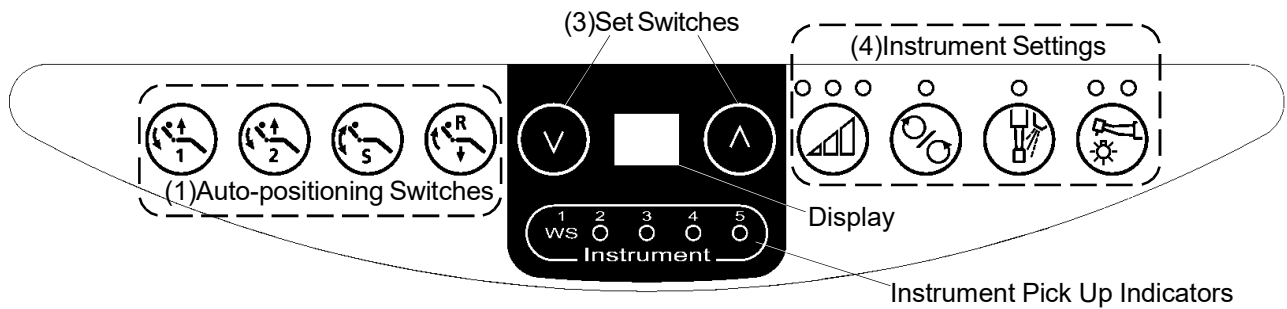
2)Instrument Control**

Among the switches for instrument settings on the dentist's panel, "Spray ON/OFF" and "Rotation Direction" functions can be operated by the extended function levers on the foot pedal. See the right illustration.

Operations that can be operated with the extended function lever are changeable. (There is a case that changeable operations are limited.) Please contact the dealer whom you purchased the dental treatment unit from or a nearby Morita Corporation if you would like to change the setting.

**There is, depending on the combination of optional equipments, a case that a part of functions can not be operated with the extended function lever.

3. Dentist's Switch Panel

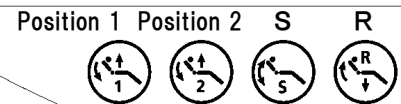


(1)Auto-positioning Switches

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.

ADVICE The chair begins to move after pressing and releasing the Switches for setting position (Set1/Set2/R) of the chair.

<Auto-positioning Switches>



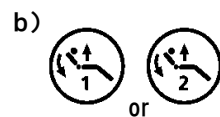
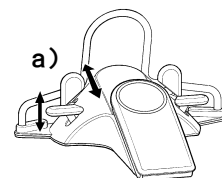
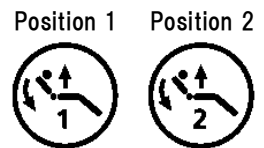
1)Treatment Positions 1 and 2

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.)

<Setting the Treatment Positions>

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



2)S

This switch is used for raising the chair to let the patient rinse his mouth and returning the chair back to a previous position. The chair temporarily memorizes a position just before its being raised and move back to the previous position after the patient has finished rinsing his mouth.



3)R

Used before and after treatment.

Seat goes down to its lowest position and back rest goes up to about 78°.



(2)Auto Positioning Emergency 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.

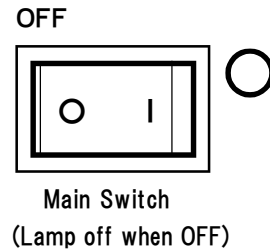
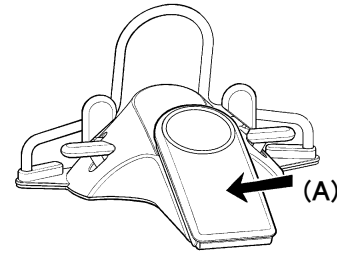
1)Emergency Stop

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.

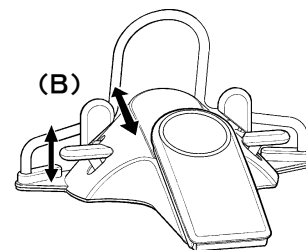
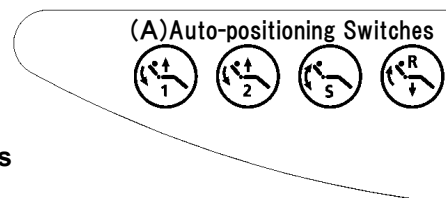


2)Cancel

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 dentist or assistant's side.

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



3)Safety Stop and Avoidance Mode

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

ADVICE

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.

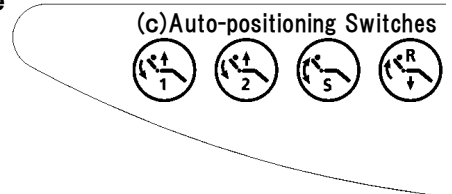
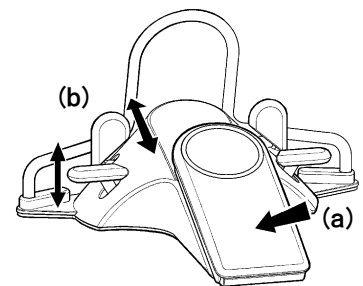
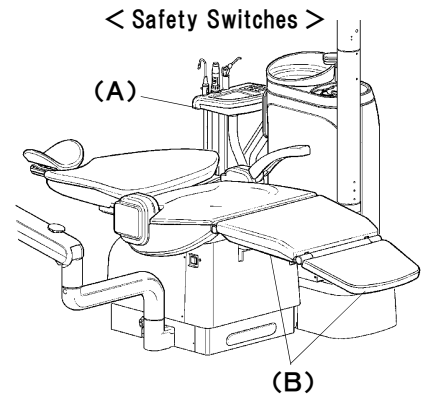
Reverse the chair's movement using any of the following methods:

(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)

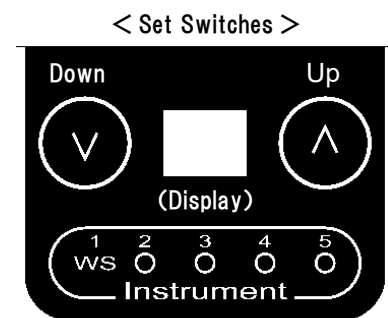
(c) Press any one of the auto-positioning switches on either the dentist or assistant's side.



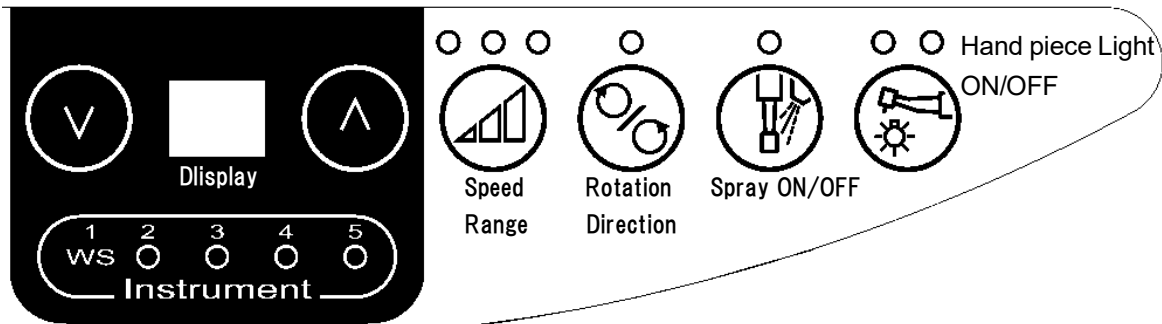
(3)Set Switches

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.



(4)Instrument Switches and Displays



Instrument Pick Up Indicators

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

Settings can all stored in memory.

⚠ WARNING	
!	<p>Always stop using an instrument before changing any settings.</p> <p>>>Changing settings while an instrument is actually in use could result in a serious accident.</p>

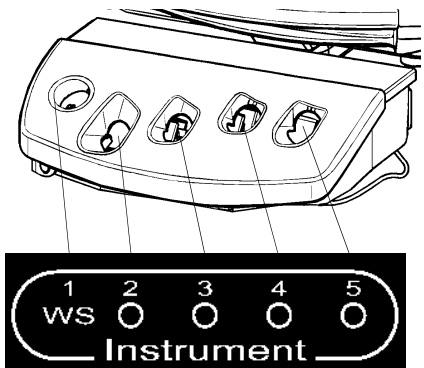
1)Instrument Selection

Once an instrument is taken out from the holder, the instrument is recognized as being selected, and then it can be used. (except three-way syringe) to the instrument until it is put back to the holder.

A circuit of an instrument being used is displayed on the instrument pick up indicators. Refer to the right illustration.)

For your information, the indicator does not display actual arrangement of instruments, depending on specification.

< Standard Usage Example >



Lamps lights up for instrument that can be used

2) Display

The display shows various settings and information.

The following are the main functions:

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

(A)Shows lock status (When chair lock is set on: Refer to the section 5))

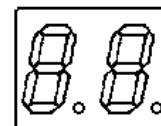
>>**When an instrument is selected**

(B)Shows instrument setting(HS/LS)

(C)Shows power of ultrasonic scaler* (when equipped with ultrasonic scaler : Refer to the section 4))

>>**When a setting are being done**

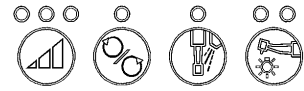
(D)Shows the setting being selected(HP/CH/Setting number)

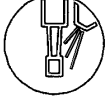
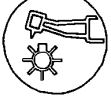

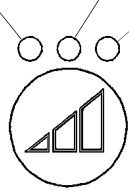


3) Instrument Switches and Displays

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:

< Instrument Settings >



Switch	Lamp	Content
Spray 	Spray On: Green Spray Off: Amber	Turn spray on and off
Light** 	On(Low):Green ON(High):Green&Green Light Off:Amber	Turn Light on(Low/High) and off
Speed Range*** 	Selected range lamp lights up UL/L M H amber/green green green 	Air Turbine (No Select)
		Micromotor Ultra Low / Low / Medium / High

** : Does not work if not equipped with light

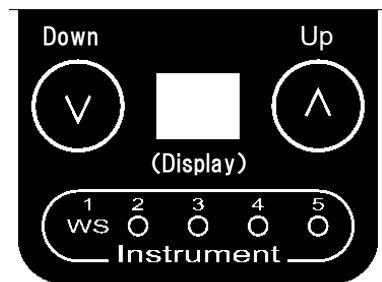
*** : Differs somewhat depending on instrument



4)Using Set Switches

Pick up the instrument and look at the display.

- 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 >

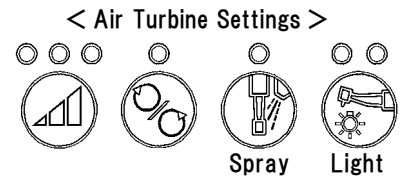


Set Switches	Selections
  (-) (+)	<Air Turbine> (No changeable settings) <Micromotor> (No changeable settings) <Ultra Sonic Scaler> Maximum Power Level**

** : Settings may differ depending on model.

5) Air Turbine Setting


There are no peculiar settings for air turbine handpiece.

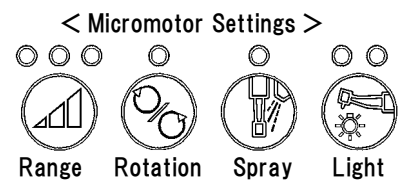


6) Micromotor Setting

Press the switch to change the setting.

The status of the lamp indicates the setting.


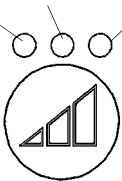
Switch	Lamp	Content
Rotation Direction 	Green: Forward Amber: Reverse	Forward or Reverse Rotation

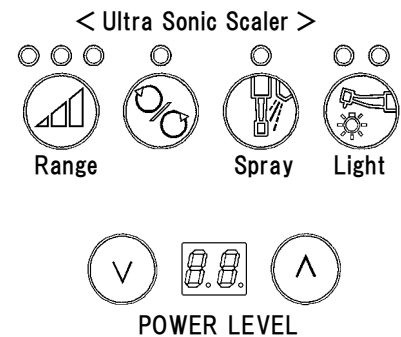


7) Ultra Sonic Scaler * Setting

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

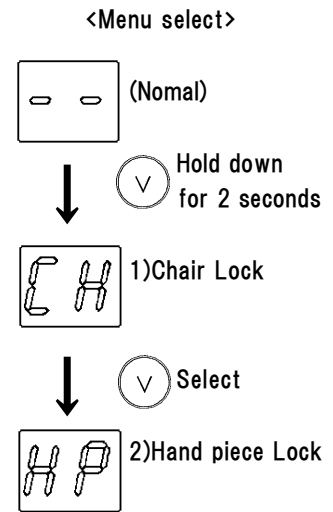


** : Settings may differ depending on model.

* : Option

(5)Chair Lock/Handpiece Lock

The menu selection display on lock is brought up if the set switch is hold down for 2 seconds while all dentist side instruments are put away in the instrument holder. Do setting when the need arises. Setting is memorized until a next change is set. Pick up one of the instruments at dentist side to discontinue menu selection. The display turns normal if the instrument is put back to the instrument holder again.



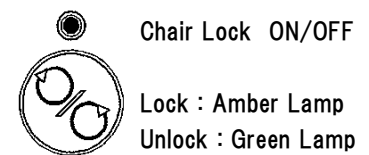
1) Chair Lock

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)Press the set switch to bring up the chair lock display.

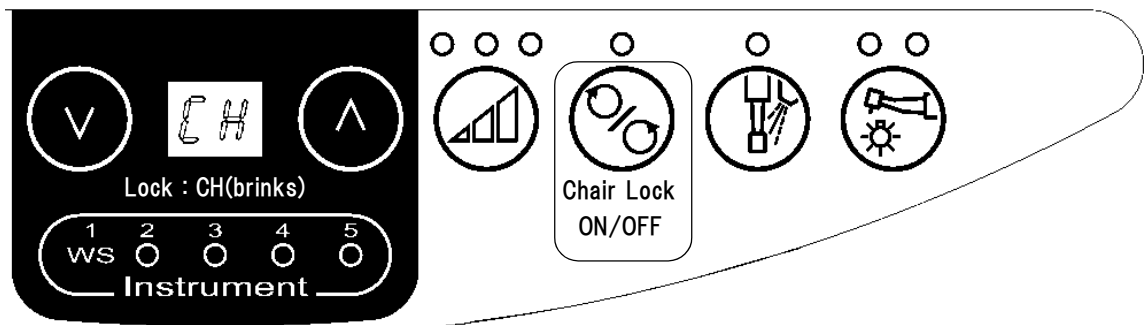


b)Press the Rotation switch and then select ON(locked) or OFF(unlocked). While the chair is locked, the lamp of the Rotation switch lights up in orange and “CH” on the display blinks.



CHECK

While the chair is unlocked, the lamp of the instrument pick up indicators lights up in green and “CH” on the display lights up.



c)Pick up one of the instruments at dentist side to discontinue setting.

The display turns normal when the instrument is put back to the instrument holder again.

When you cancel the chair lock or set it again, start again from the a) above.

2) 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.

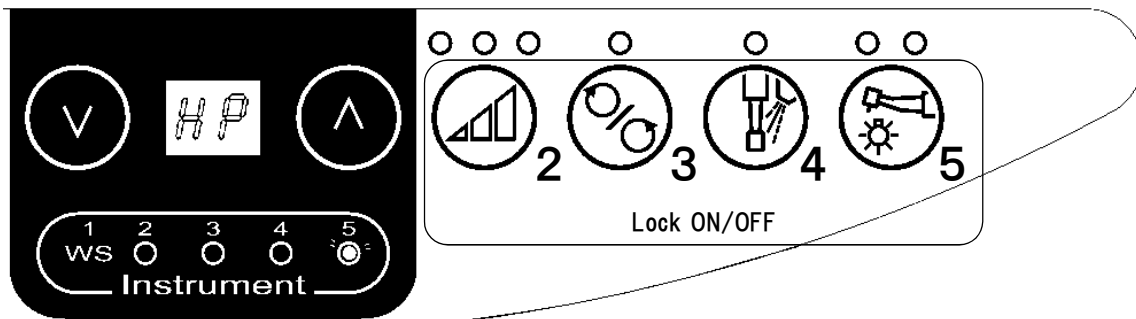
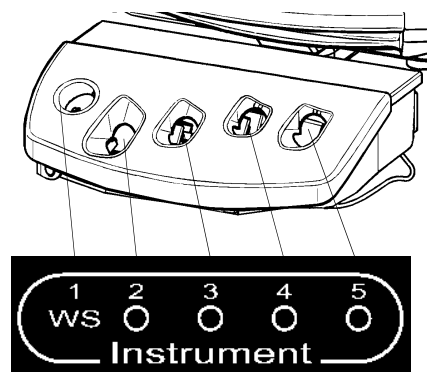
a) Press the set switch to bring up the HP lock display.



b) Press a switch corresponding to a handpiece to be locked and then select ON(locked) or OFF(unlocked).

< Standard Usage Example >

CHECK While a handpiece is unlocked, the lamp of the instrument pick up indicators lights up.
For your information, a lamp of the instrument pick up indicators corresponding to a circuit without handpiece lights up at all times.



Lock : Lamp Brinks

c) Pick up one of the instruments at dentist's side to discontinue setting. The display turns normal if the instrument is put back to the instrument holder again.

When you cancel chair lock or set it again, start again from the a) above.

4. Assistant's Switch Panel

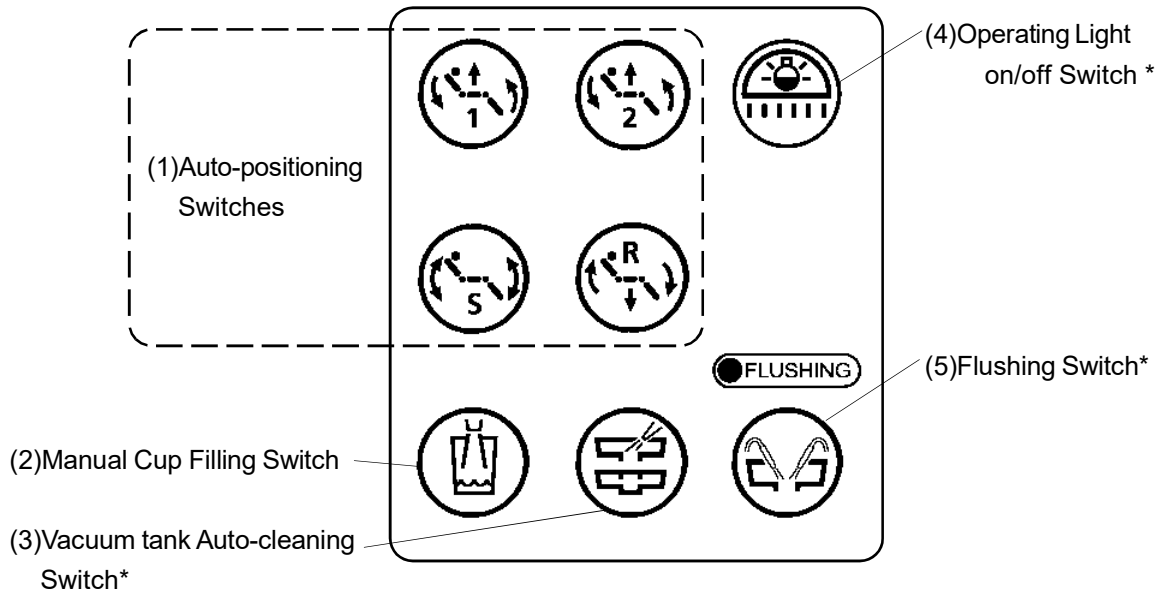


Illustration above shows the switches on the assistant's switch panel. A switch is disabled if the unit is not equipped with the corresponding function.

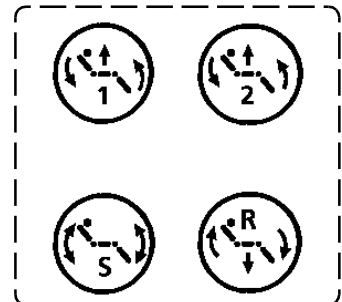
(1)Auto-positioning Switches

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)R 3)S

ADVICE

Position setting cannot be changed with the assistant's side switch panel. It can be changed with the dentist's side switch panel.



(2)Manual Cup Filling Switch

Press this to fill cups manually.

Water flows only while this switch is being held down.

ADVICE

Make sure a cup is in place. Otherwise, water might spill and be splashed around the area.



(3)Vacuum Tank Auto Cleaning Switch

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

Press this switch to automatically clean the vacuum tank.

For details refer to [5] 7. in this manual.



(4)Operating Light On/Off Switch

Press this switch to turn the light on and off.

Only for units that have the auto light function. **



** : Disabled if unit is not equipped with this function.

* : option

(5)Flushing Switch*

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. of this manual.





Flushing Lamp



Flushing Switch

5. Instrument Holders

CAUTION

	<p>Before moving the seat or back rest, ensure the instrument holder has been clear and will not be hit by them.</p> <p>>>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>When adjusting the position or angle of an instrument holder, grip the holder or its arm firmly and move it carefully.</p> <p>>>Do not grip the instrument section or use excessive force; this could seriously damage the holder.</p>
	<p>The act of putting a strain is not allowed for Main tubes. (When the table draws it or strongly pulls while cleaning.)</p> <p>>>This could result in air or water leakage as well as serious damage.</p>

(1)Dentist's 5 Instrument Holder

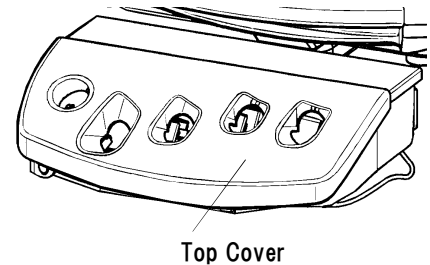
The holder arm may be moved horizontally. Firmly grip both sides of the holder and carefully move it into the desired position.

1)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.

- 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.



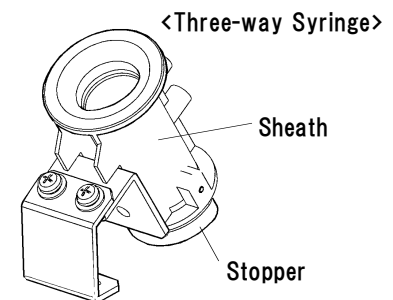
2)Main Tube Disconnection

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.

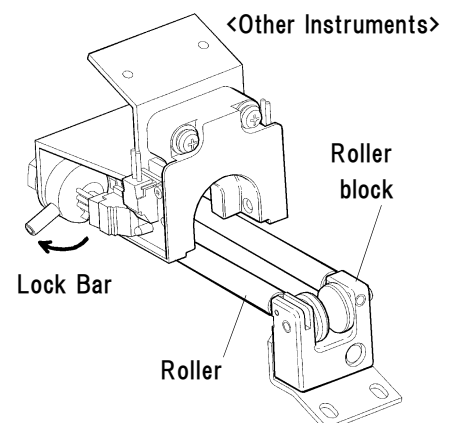
<Three-way Syringe>

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.



(2)Assistant's Holder

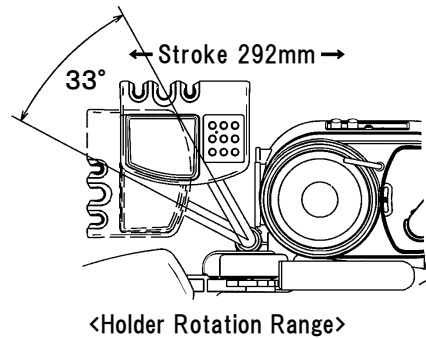
 WARNING	
	<p>Never put a heavy load on the assistant's holder or apply excessive force to it. >>This could seriously damage it.</p>
	<p>Whenever you move the holder or its support, pay close attention to safety especially concerning the following points:</p> <ol style="list-style-type: none"> 1. Keeps fingers, other body parts, bags, etc. well away from the joints and moving parts of the support. (Do not grip the support or the base of the holder.) 2. Do not let the patient touch it. Especially watch out for what children are doing. 3. Keep all obstacles away from the movement range of the support. 4. Do not do anything else which seems dangerous. 5. Do not move the holder if there seems to be some danger. <p>>>Otherwise, there could be an accident resulting in injury or damage.</p>

1)Assistant's Holder Support

The holder turns horizontally. Since the main part of the arm slides back and forth, position of the arm can be adapted to a treatment style.

When changing the position of the holder, move it slowly, holding a shaft on the bottom of the holder.

When changing the position of the arm, move it slowly, holding the part of the arm under the holder.



2)Assistant's Auxiliary Tray

WARNING

Never put a load greater than 10 N (1 kgf) on the assistant's auxiliary tray.

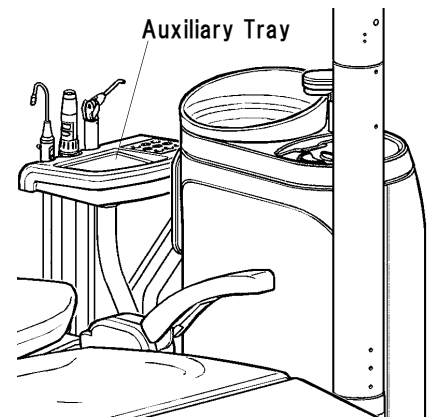
>>This could seriously damage it if the support suddenly went down.



Do not put a medical vial, an alcohol lamp, or other things (mainly, liquids) on the assistant's auxiliary tray that could cause an injury if they fall.





>>If those fell accidentally while the arm is moving, that would result in an accident. That would cause discoloration of outer surface with chemical solution or machine trouble with running liquid into the inside.

There is a space on a part of the assistant's holder which can be used as an auxiliary table.



6. Instruments

WARNING

	<p>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.</p> <p>>>Incorrect operation and handling of these instruments could result in an accident resulting in injury or damage to the instrument.</p>
	<p>Return instruments to their holders carefully and ensure they are correctly secured.</p> <p>>>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>If the main tube for the air turbine swells up during use, stop using it immediately and check the air exhaust line.</p> <p>>>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>Never pinch or excessively bend the main tubes, especially the air turbine tube when it is running.</p> <p>>>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>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.</p> <p>>>When air is used for gums, the syndrome of happening by accident such as the subcutaneous emphysemas might be caused.</p>

(1)Air Turbine Hand piece

1)Operation

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

When the spray is on, rotation and spay can be operated by the foot pedal.

Splay ON(Basic)		
Pedal	Rotaion	Splay
Step	Hold	OFF-ON
Full Step	Hold	ON

2)Air Turbine variable speed settings*

In case the variable speed control is equipped optionally, rotation between low and high can be adjusted steplessly. Also, conversion (constant or variable)of rotation speed mode is possible.

When the spray is on, rotation and spay can be operated by the foot pedal.

Splay ON(Variable*)		
Pedal	Rotaion	Splay
Step	Variable	OFF-ON
Full Step	Top speed	ON

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 10 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.

ADVICE

In case you use an air scaler, the optional equipment of the air turbine with the variable speed control* is recommended. The power of vibration is adjustable with the variable speed control.

*:option

(3)Micromotor

1)Operation

Take the micromotor out of its holder and step on the foot pedal to operate it.
When the spray is on, spray starts the moment the foot pedal is pressed.

Splay ON(Micromotor)		
Pedal	Rotaion	Splay
Step	Variable	ON



2)Rotation speed of variable range

The speed varies within each range of the right chart.
Select the speed range with the speed range switch on the dentist's switch panel.
See the right chart for the standard speed at each range.
During rotation, the air for cooling and blowing flows out (except UL and L range)

Micromotor Speed Estimates	
Setting	Range (min ⁻¹) *1
UL (Ultra Low)	100 - 250 *2
L (Low)	100 - 3,000 *2
M (Medium)	100 - 9,000
H (High)	100 - 40,000

*1: Factory setting
*2: Tip Air Off(Factory setting)

3)Micromotor Overload Protection Circuit

 CAUTION	
	<p>Never press down with steady and excessive force or intentionally cause the motor to stop by overloading it.</p> <p>>>Repeated or frequent triggering of the micromotor's overload protection circuit will Cause it to overheat and result in damaging the motor.</p>

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.
Release the foot pedal once and remove the cause of the load. Then press the pedal again to restart the motor.

(4)Three-way Syringe

⚠WARNING



Always check the temperature settings for water warmers, if the unit is equipped with them.

>>If the heaters are set too high, the patient could be burned or the equipment could be damage.

⚠CAUTION



During hot weather,turn the heater off.

>>Otherwise,over heating could shorten the working life of the main tube and the heater.

Keep it away from the heating system so that the hot air does not hit it directly.

>>The heat causes the tube to soften and expand, causing breakage and other damage.

1)Operation

This syringe can emit air or water or spray.

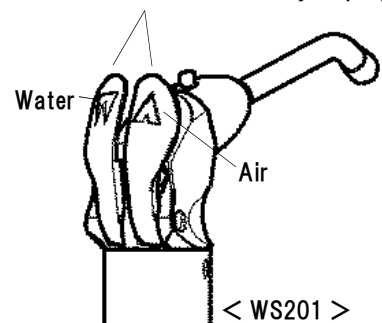
Press the right lever for air.

Press the left lever for water.

Press both levers at the same time for a misty spray.

If necessary, both air and water can be warmed. See 2) and 3) below.

Both leavers Simultaneously : Spray



2)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.)

3)Warm Water thermal effect

 CAUTION



If warm air is not needed in the summer or at any other time, disconnect the heater inside the tube to turn it off.

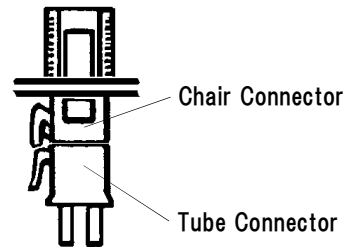
>>If the heater gets too hot, the heater and the tube could be damaged, and the working life of both will be shortened.

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

Turn off the main switch, and then follow the procedure below. (Same for both the dentist's and the assistant's syringe.)

a)Plug the tube connector into the chair connector(at the side of where the main tube is connected to the chair).

b)Turn on the main switch to let the heater inside the tube work. Let the warm water spout and then check its temperature.



<Temperature Adjustment>

Use a miniature screwdriver to turn the temperature adjustment shaft (see diagram to the right).

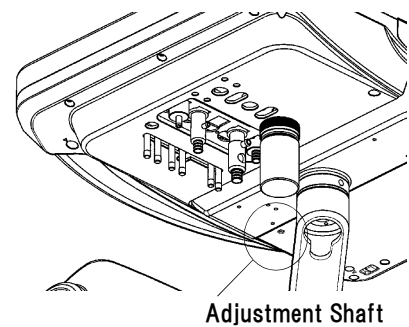
The dentist's and assistant's syringes are adjusted separately.

CHECK

How warm the air gets depends on the room temperature and how frequently it is used. Make sure the heater is properly adjusted and does not overheat.



Temperature adjustment for dentist's side three-way syringe:
Turn the adjustment shaft on the bottom of dentist's table.



Temperature adjustment for assistant's side threeway syringe:
Turn the adjustment shaft in the basin unit.

*:option

(5)Three-way Syringe WS201 <Removable Nozzle>**CAUTION**

Before using the three-way syringe, make sure to check that the screw fixing the tube at the low end of the syringe is tightened up.

If the screw is not tightened up, tighten it up with your fingers.

>>If the tube comes off the syringe, the head of the tube will spring out suddenly. That would cause an unexpected accident and the leakage of water and air.

For operation and settings, see (4) above.

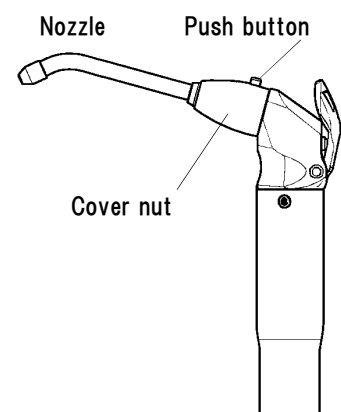
1)Remove Nozzle

The nozzle can be removed and autoclaved.

Hold down the push button, grip the cover nut and pull the nozzle straight out.

2)Nozzle Attachment

To reattach the nozzle, hold down the push button, grip the cover nut and push the nozzle straight in.

**(6)Three-way Syringe WS97*** <Snap-on Connection>

For operation and settings, see (4) above.

1)Remove Body

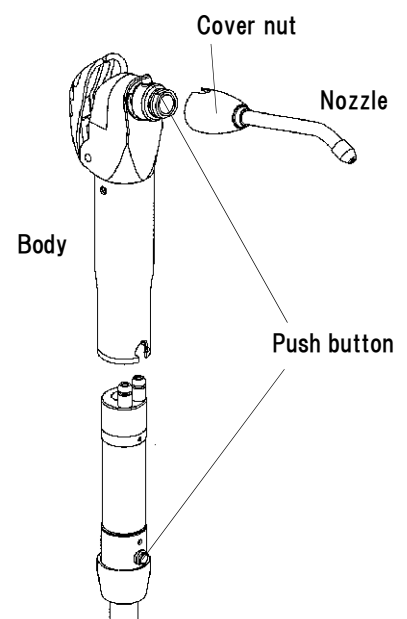
The body can be removed and autoclaved.

Hold down the push button for the body and pull it straight off.

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

2)Body Attachment

To reattach the body, hold down the push button and push it straight on.



(7) Vacuum Syringe VS-110

1)Operation

a)Suction Power ON/OFF

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.

b)Adjustment of suction power

Suction power can be adjusted by sliding the plate on the center of the syringe body. Refer to the right illustration.

2)Connection of the tip

Insert the tip into the recess of the syringe body firmly.

3)Disassembly of the syringe body

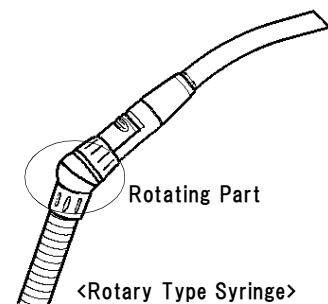
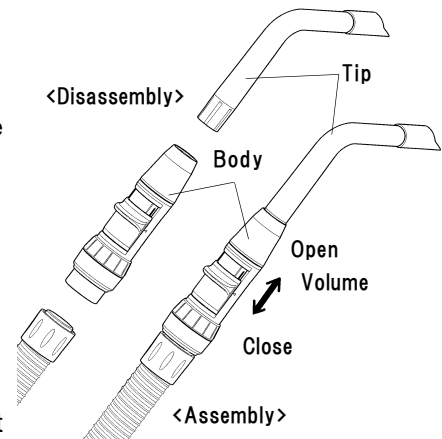
Syringe body is autoclavable, and it can be disassembled as the right illustration.

Hold the back and forth of the syringe firmly and then unscrew the body.

4)Adjustment of body angle of the rotary syringe*

Body angle of the rotary type syringe to the tube can be adjusted by rotating the root of the syringe. Adjust it if the need arises.

Turn the root of the syringe, holding the back and forth of the rotating part firmly.



(8)Saliva Ejector SE-110

1)Operation

a)Suction Power ON/OFF

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.

b)Adjustment of suction power

Suction power can be adjusted by turning the lever on the center of the syringe body. See the right illustration.

2)Connection of the SE nozzle

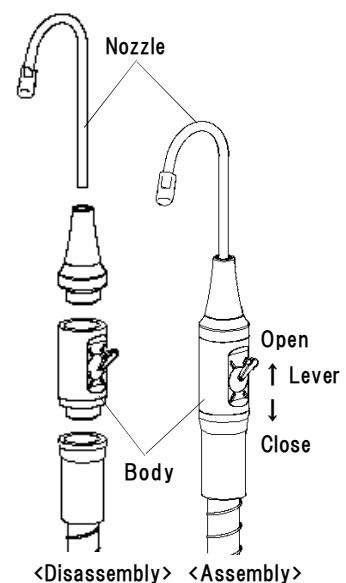
Insert the SE nozzle to the top of the rubber part of the ejector until it cannot unfasten easily.

The SE nozzle is flexible and its angle can be changed freely.

3)Disassembly of the body

Syringe body is autoclavable, and it can be disassembled like the right illustration.

Hold the back and forth of the syringe firmly and then unscrew the body.



*:option

(9)Ultrasonic Scaler*

1)Attaching the handpiece

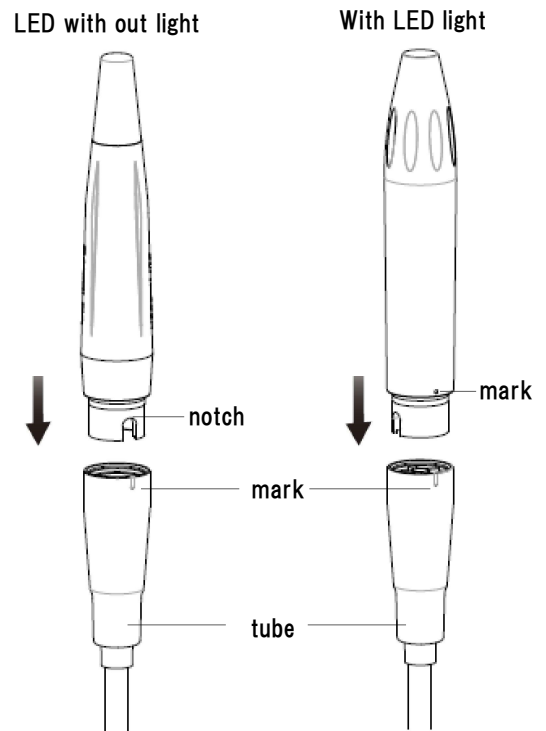
LED without light

Align the notch on the handpiece side with the mark on the tube side and insert the syringe.

With LED Light

Align the handpiece side mark with the tube side mark and insert the syringe.

Please connect the handpiece and tube reliably.
It may unexpectedly deviate if it is not securely connected.



2)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 [5]3.(3) below.)

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

Splay ON (Ultrasonic Scaler)

Pedal	Rotaion	Splay
Step	Hold	ON

Power Level Estimates

Setting	Power Range
PER (Weak)	0.5(weakest) - 10
END (Medium)	0.5 - 10
SCL (strong)	0.5 - 10(strongest)

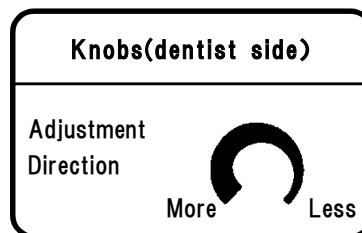
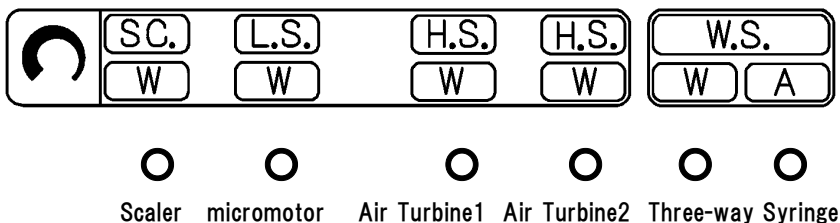
*:option

(10)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.

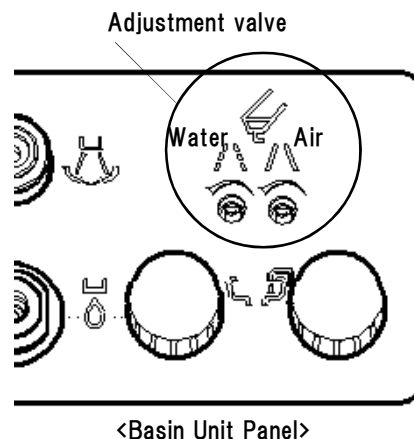


The arrangement of the knob differs, depending on equipment options.

2)Assistant's Three-way Syringe

Turn the adjustment valves on the basin unit panel, following the indication there.

Use a miniature flat head screwdriver.



7. Basin Unit

⚠ WARNING



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.

>>Any of the above actions could cause the unit to suddenly turn resulting in an accident, bodily injury or damage to equipment.

Do not move the seat or backrest if the door on the basin unit is open.

>>Doing so could cause an injury or damage.

⚠ CAUTION



Ensure the area is clear of obstacles before opening the door.

>>Otherwise the door or other equipment could be damaged.

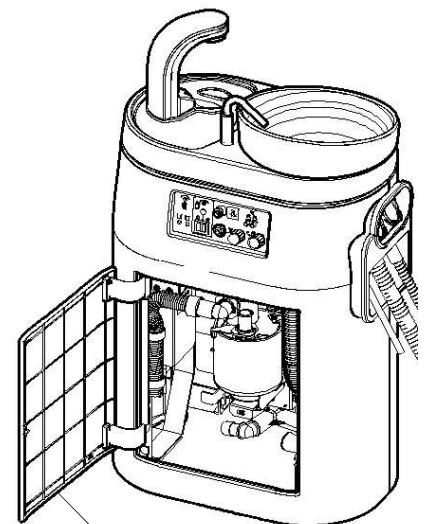
(1)Basin Unit

1)Open and Close Basin Unit Door

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

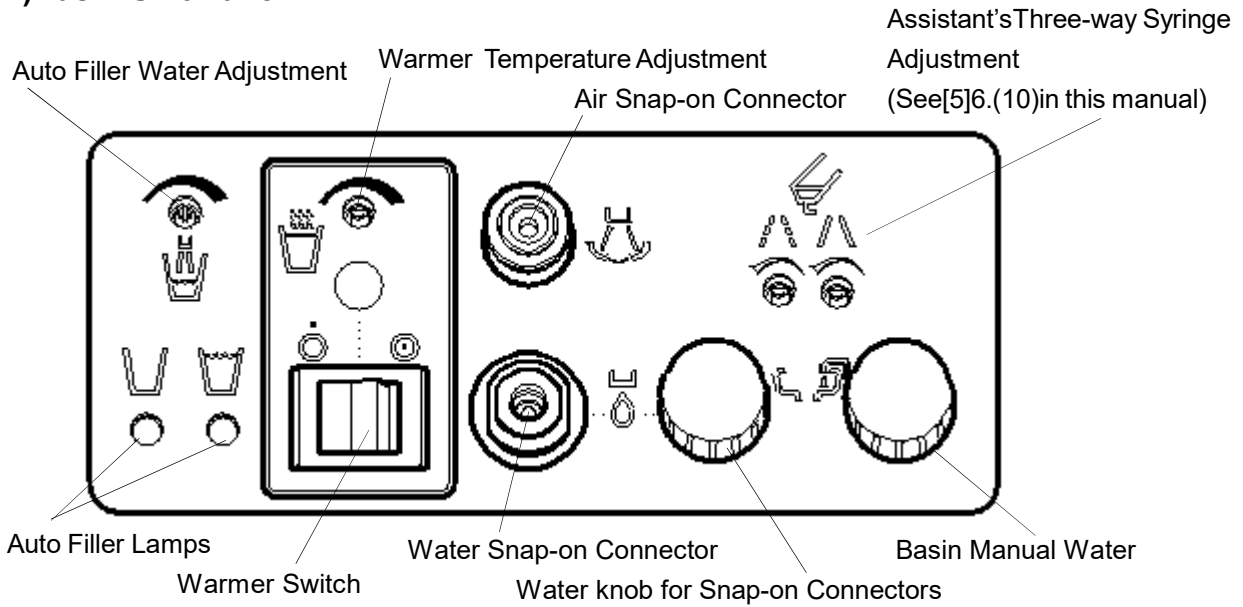
a)Open the door by pressing on the catch in the center along the right hand side. The door opens at an angle of approximately 100 degrees.

b)Close the door by pushing it in until the catch holds it closed.



Basin Unit Door

2) 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.

3) 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 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 Switch

*:option

4)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.

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.

b)An inside magnet switch detects the flushing device, and then the flushing preparation mode boots up automatically.

CHECK

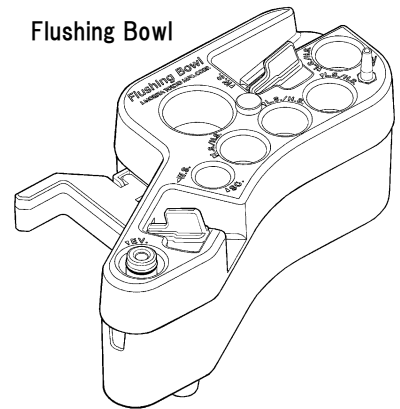
Once the body detects the flushing device, the flushing lamp on the assistant's switch panel lights up. Seeing the flush lamp light up, you can confirm that the flushing device is set up on the basin properly.

c)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.

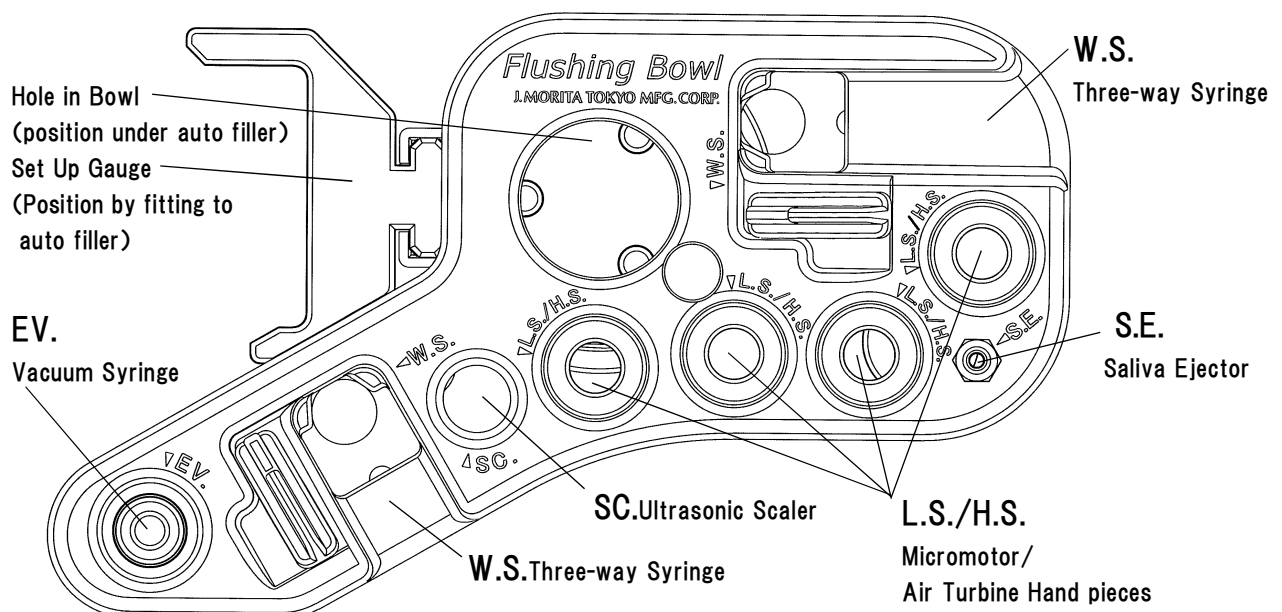


 Flushing Lamp



Flushing Switch

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.

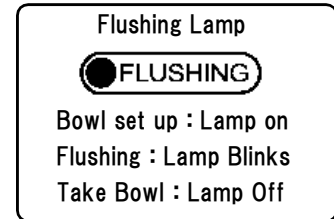
 Flushing Lamp



Flushing Switch

<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)

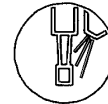


- d)The lamp above the switch goes out when the procedure is finished.
Disconnect all the tubes and put them back in their holders.

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.

Spray Switch



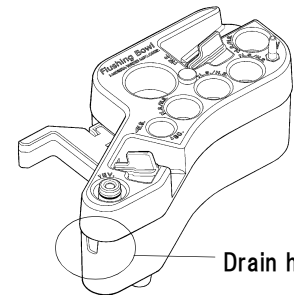
Stage1 ~ 3,6: Amber Lamp Blinks
Stage4: Green Lamp Blinks
Finished: Amber Lamp Off

- e)Take the flushing bowl off the basin.

CHECK

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

If considerable water is left in the bowl, drain it out through the drain hole.

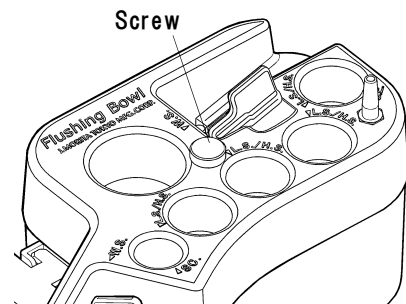


f)Take Bowl Apart

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.



(2)Warmer

⚠ CAUTION



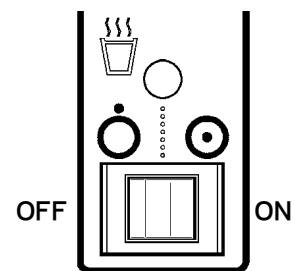
Whenever the warmer is turned on pay close attention to how hot the water is. Turn the warmer off whenever it is not needed such as in the summer.
 >>Otherwise, the water could get too hot and burn the patient. Also it could over-heat and breakdown.

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.



Warmer Switch

2)Warmer Temperature Adjustment

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

a)Turn the temperature adjustment to change the temperature of the water. Use a miniature flat head screwdriver.

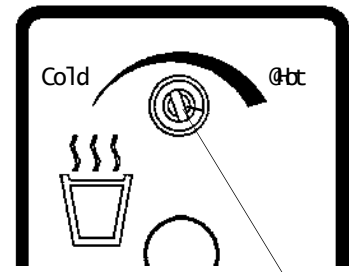
b)After waiting for a while, check the temperature of the cup water and the threeway syringe. Do this several times if necessary.

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.

c)Check that the water temperature is proper for use.

Warmer Temperature Adjustment



With a miniature flat head screw driver

(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.

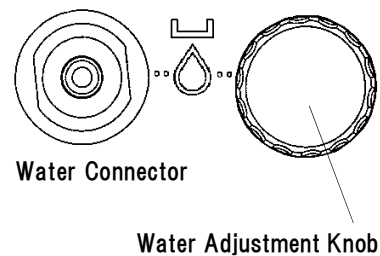
b)Water flow can be adjusted with the valve above the connector.
Air will flow at a steady rate depending on the pressure inside the chair unit.

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.



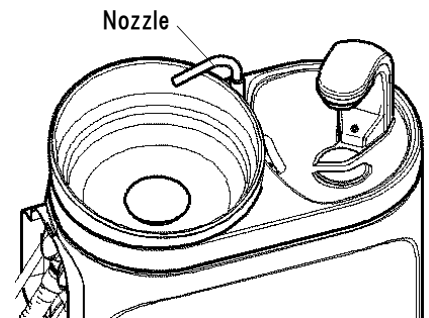
*:option

(4)Basin**⚠ CAUTION**

	<p>Do not drop or bump the basin when it is taken off the unit. Do not scrub it vigorously or use hard or sharp objects on it. >>Any of the above could damage or spoil the basin.</p>
	<p>Do not leave chemicals with dark or strong colors in the basin for too long. 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. >>Otherwise, the spittoon could become permanently discolored.</p>
	<p>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. >>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>

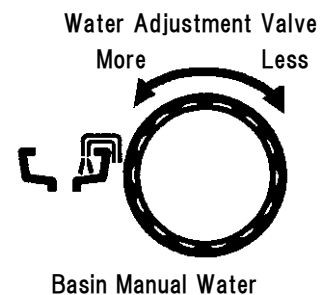
1)Basin Auto Rinsing

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

**2)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.



3)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.

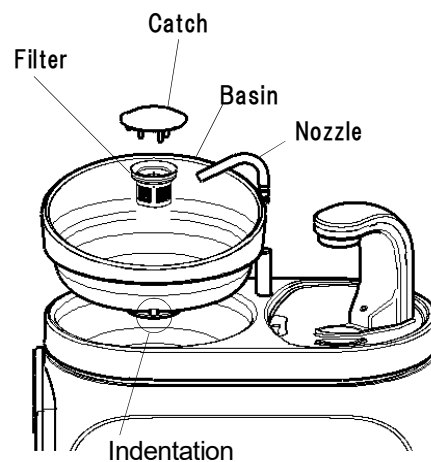
Put your fingers in the gap between the basin and the top of the basin unit and ease the basin up slightly. Then press down on the top of the unit and pull the basin straight up and off.

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.

CHECK

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.



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

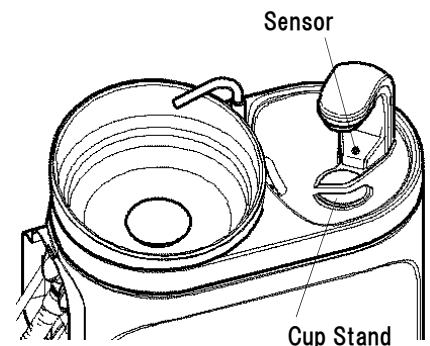
Place a cup on the stand. (The cup can be of any material, paper, metal, etc.) The cup will be detected and filled to the specified level. If the cup is already full when it is detected, a little water will run and then stop.

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

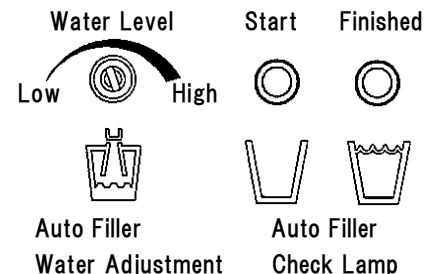
This is set at the factory using the small dental cup as a standard. It can be changed in the following way:

a) The adjustment screw is on the basin unit panel.

Use a small flat head screwdriver.

b) Follow the marking for the screw to adjust the level.

c) 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.

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.



Manual cup filler switch
<Assistant's Side>

4)Cup Stand Drain

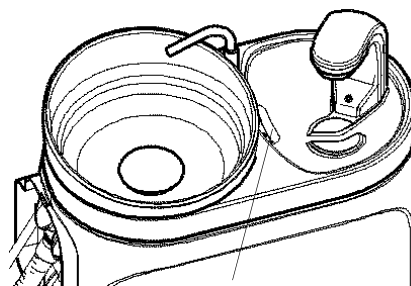
There is a drain around the cup stand. Spilled water is discharged into the drain.

CHECK

If something like a prosthetic device falls into this drain, refer to section [6] 8. in this manual for instructions on how to open the drain trap.

ADVICE

Do not intentionally use this drain to get rid of foreign debris or contaminated water. It could plug up.



Cup Stand Drain

9.Dentist's Tray

⚠WARNING



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.
 >>A load greater than 30N could cause the tray to fall down resulting in bodily injury or damage to equipment.



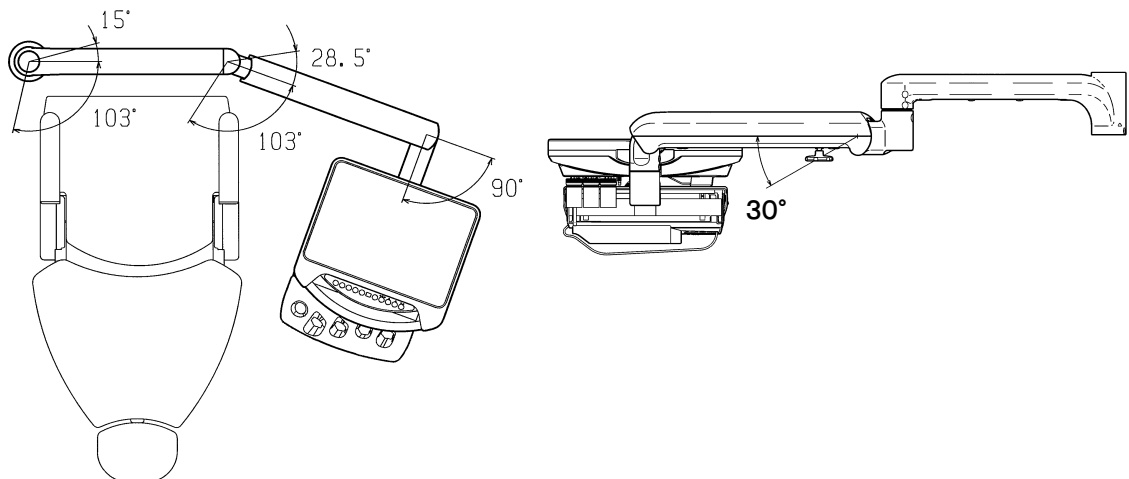
Ensure the tray knob is properly adjusted.
 >>Otherwise, the tray could suddenly spring up or fall down resulting in an accident or damage to equipment.

(1)Over Arm and Floor Arm

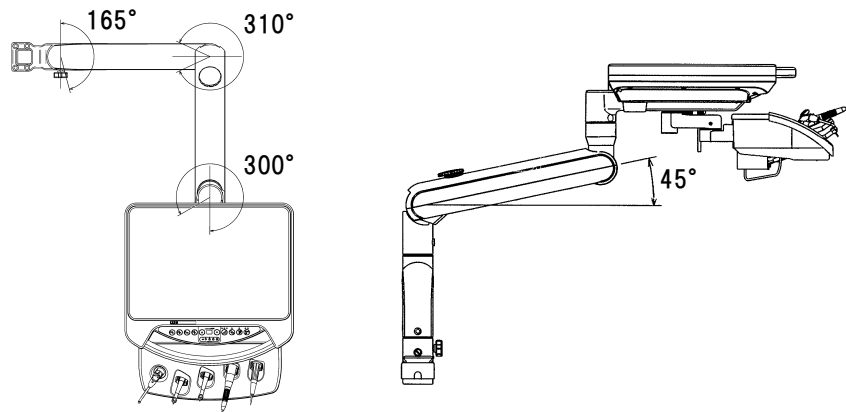
1)Operation

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

<Over Arm>



<Floor Arm>



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.

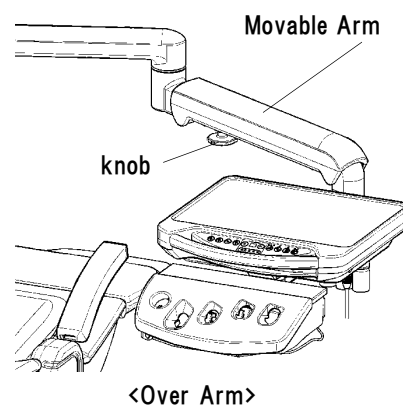
Tightening this knob completely will lock the arm in place and keep it from moving up and down.

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.

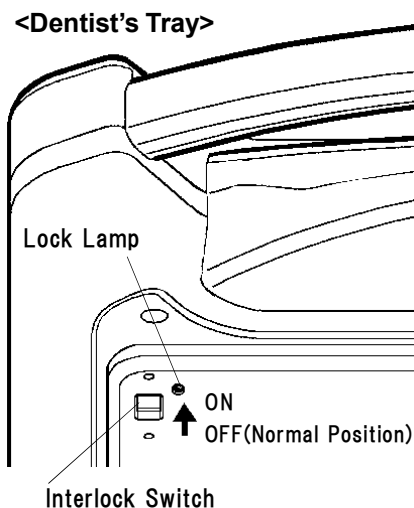


3)Interlock Switch

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

- a)Seat and Backrest Movement (both auto and manual)
- b)Instruments for both the dentist and the assistant (except for the threeway syringes, vacuum syringe and saliva ejector)
- c)Panel switches on both the dentist's and assistant's sides

If the unit is equipped with the auto light, the operating light will stay on when the interlock switch is locked.



(3)Cart Type***⚠WARNING**

For optimum safety, pay attention to be the following points when using the cart type tray:

- 1) Make sure patients and other people are aware of the hoses on the floor and do not lean on them.
 - 2) Do not move the cart with excessive force or rapidly. Do not lean on it or lean things against it. Do not place an unbalanced load on it.
 - 3) Do not pull on hoses, use hoses to pull the cart, or bend hoses too much. Do not step on hoses or damage them in any way.
- >>Otherwise damage or an injury could result.

Make sure the floor is level.

Do not lay the cart down or use it in a tilted position.

>>If the cart is tilted more than 10 degrees or used on surface with uneven levels, it could suddenly slide down.

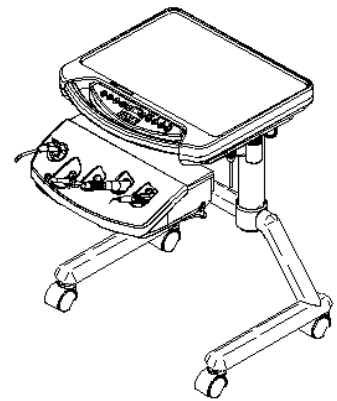
Make sure that height adjustment knob is always properly tightened up.

>>Otherwise, the tray could suddenly slide down resulting in an injury or damage.

1)Operation

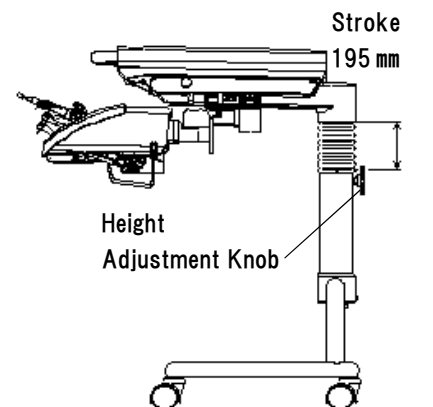
Push the cart on its casters to place it in the best position.

Grip the handle and move it carefully.

**2)Height Adjustment**

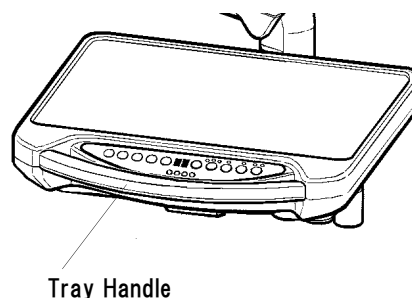
Adjust the height of the tray in the following way:

- 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.



(4)Tray Handle

Disinfect the handle by wiping it with ethanol.



(5)Waste Container Stand

This is a stand for placing a waste container on the table. Ethanol disinfection and autoclave sterilization(135c) are possible.

1)Assembly of waste container

Use the exclusive paper cup and the star cap accessories.

Fit the star cap into the top of the paper cup to make a waste container.

Put the edge of the paper cup and the groove of the star cap together and then press the cap on the cup slowly.

2)Set up

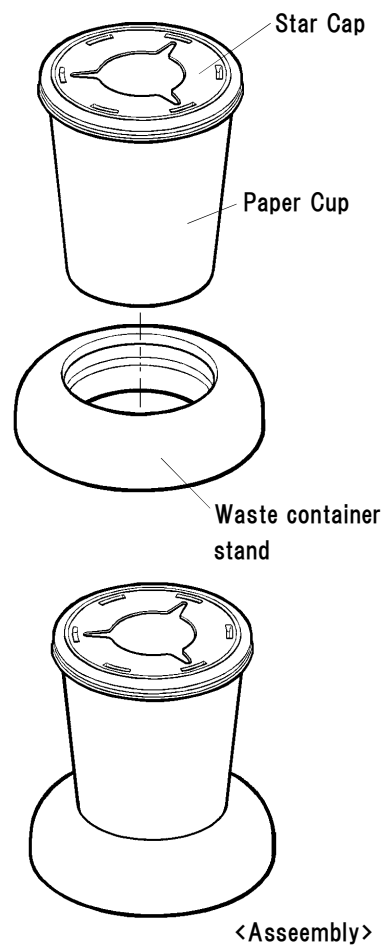
a)Set the waste container stand to the waste container.

Insert the bottom of the paper cup to the waste container stand straight.

ADVICE

Paper cup will be deformed if the cap is pressed too strongly or inserted obliquely.

b)Place it on the table.



3)Replacement

Dispose of an old cup in a prescribed manner and replace it with a new one timely. Pull the cup out straight, holding the waste container stand.

ADVICE

If you grasp the cup hard, the contents of the cup will spout.

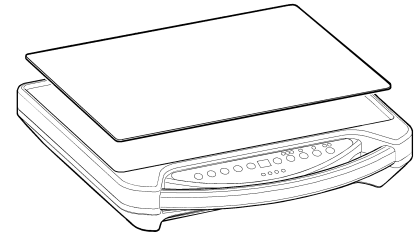
When you run out of cups or caps, order a new supply from your local dealer or J.Morita Corp.

(6)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.

**(7)Silicon Tray Sheet ***

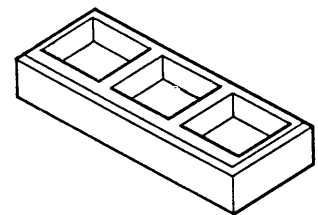
Lay this on top of the tray.

This silicon sheet may be disinfected by wiping with ethanol or autoclave.

(8)Silicon Medicinal Vial Holder*

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

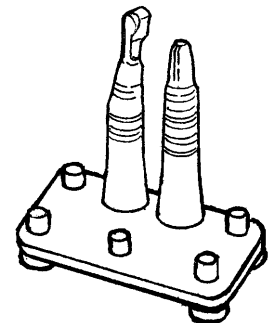
This holder may be disinfected by wiping with ethanol or autoclave.

**(9)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⁻¹ micromotors).

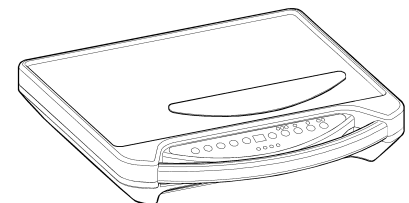
Replace the oil absorbing pad attached to the contra stand for a new one timely. (It is available as an optional accessory.)

**(10)Switch Panel Cover ***

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

Replace the switch panel cover for a new one timely.

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.

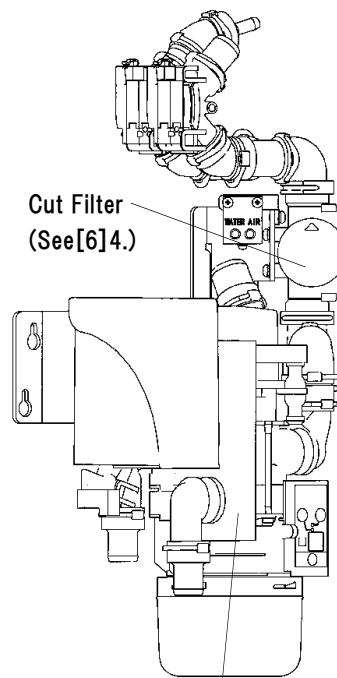
Please follow the directions in the manual.

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.

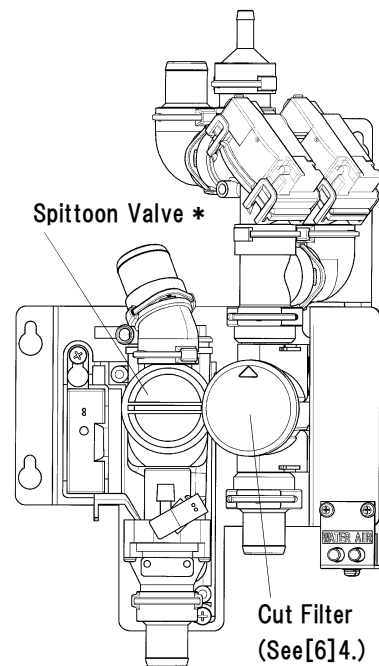


Amalgam separator *

*:option

11. Spittoon Valve *

Please follow the directions in the manual.



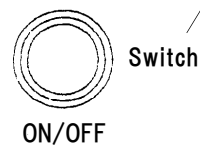
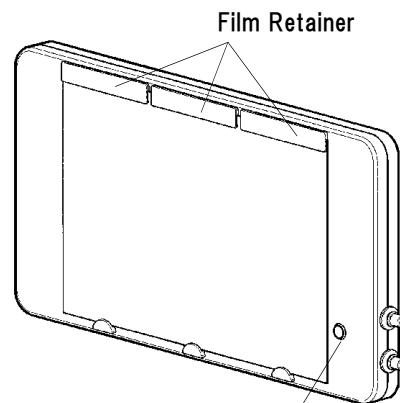
*:option

12.Film Viewers

Various film viewers can be used even after the main unit has been purchased and installed. (This depends somewhat on what other optional equipment is being used.) Contact your local dealer or the J. Morita Corp. to purchase a film viewer.

(1)Triple Viewer PFV95* <Multi-type>

Mounted on dentist's tray to view dental, panorama, and 8" X 10"films.



1)Turn On and Off

Press the switch to turn the light inside the viewer on and press it again to turn it off.

Slide the edge of the film under the retainer.

2)Light Modes

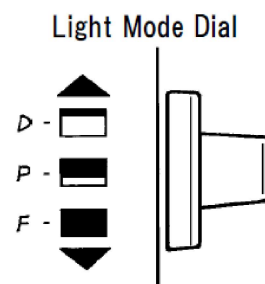
The viewer has three lights depending on the type of film being viewed.

Use the dial on the right side to change lights.

"D" for dental Film.

"P" for panorama film.

"F" for full size (8x10 inch) film.



*:option

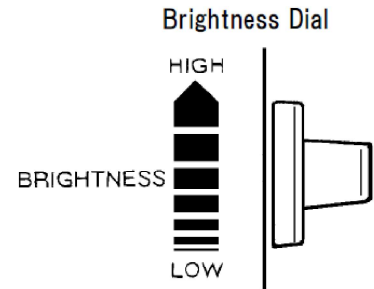
3)Brightness Adjustment

The brightness for all three light modes can be adjusted. Use the dial on the right side to adjust the brightness from low to high.




ADVICE

The light tube works best at a room temperature of 20c to 25c. It may flicker or be somewhat dim if the room is chilly during the winter etc., but, it will work normally as soon as the internal temperature goes up.

The light might become dimmer when it is switched from a small size to a larger one. This is also because of a low internal temperature, and the light will regain its brightness when it warms up.



13.Operating Light

 WARNING	
	<p>For the handling of the operating light, make sure to follow the operator manual attached to the product.</p> <p>>>Improper handling will cause an unexpected accident or trouble.</p>
	<p>Do not bump or jar the light head or the light arm.</p> <p>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.</p> <p>>>Otherwise there could be an accident resulting in bodily injury or equipment damage.</p>

Handling of the operating light depends on model or conditions of a dental treatment unit. Handle it properly, following the operator manual attached to the product.

14.Headrest

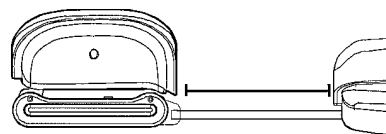
⚠ WARNING	
⊘	<p>Keep fingers, hair, clothes etc. away from the moving parts of the headrest. >>An injury could result from fingers being pinched or hair etc. being caught in the moving parts.</p>
	<p>Do not adjust the position of the headrest while the patient is on the chair. >>Damage and trouble of the ratchet part by the load and its attendant sudden movement will injure the patient's neck or head.</p>
!	<p>Make sure that the adjustment of the headrest is done by the dentist. Take care that the release lever does not be touched by the assistant who is not in a physical position to support it or the patient. >>Otherwise, a sudden fall and movement of the headrest will cause an accident resulting in injury or damage and trouble.</p>
	<p>When adjusting the angle of the headrest or letting the slide bar up and down, make sure to support the headrest and move it slowly. >>Movement without supporting the headrest would let the headrest fall suddenly. That would cause an accident such as injury or damage and trouble. Sudden movement would bruise patient's neck and head.</p>

(1)Headrest <Ratchet rotation>

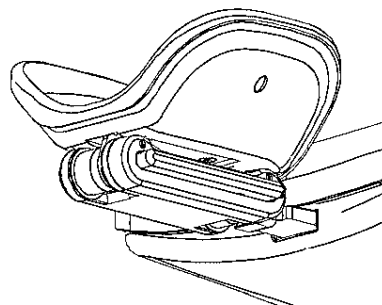
⚠ WARNING	
!	<p>When adjusting the angle of the headrest within the range shown in the illustration below, see to it that either the headrest (point A) or the lever (point B) rest on the backrest or on the slide bar. >>The headrest will be broken if a load is applied while the headrest is fixed within the range shown in the illustration below, and besides point A(or point B)is not rested on the backrest (or on the slide bar). That state will cause an accident such as injury.</p> <div style="text-align: center;"> </div>

1)In and out of the slide bar

Infinite length adjustment is possible within the range shown in the right illustration.



Grasp the headrest firmly with both hands and then let it slide to a position you like.

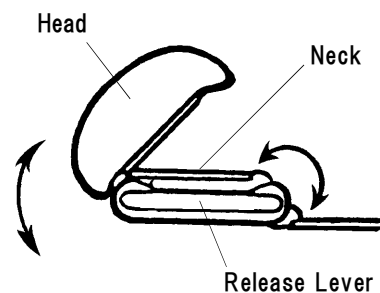


2)Angle Adjustment

Angle is adjustable at regular intervals.

Press the release lever at the neck part to move the headrest and release the release lever to stabilize it.

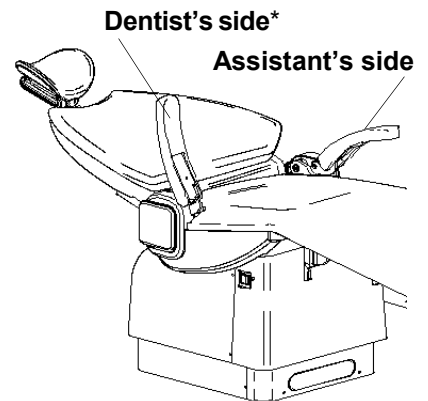
Support the neck and head parts firmly during adjustment.



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.

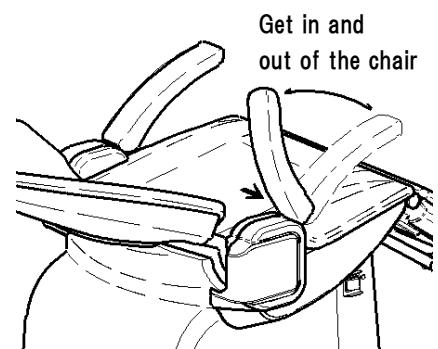
1)Raising and lowering

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

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





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

To lower it, swing it back down. It will lock into position.



*:option

16. Display *

 WARNING	
	<p>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 tone arm is not subjected to any impact.</p> <p>>>Otherwise, an accident or injury may occur.</p>
	<p>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.</p> <p>>>Either of these actions could be dangerous or cause damage.</p>
 CAUTION	
	<p>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) .</p> <p>>>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.

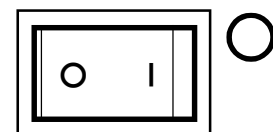
17. After Use

 WARNING	
	<p>Turn the main switch off whenever the unit is not being used. 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. >>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>Before plugging the unit back in and opening the air and water valves, ensure all the wiring and tube connections have been securely made. >>Otherwise, there is a risk of accidents and malfunctions due to short-circuiting, overheating, water leakage, etc.</p>
	<p>Never let electrical plugs or receptacles get wet or gather dust. If a plug or receptacle gets wet, immediately unplug the unit, and completely dry the plug or receptacle before using the unit. If dust has collected on a plug, unplug the unit and carefully clean off all the dust with a dry cloth or other material. >>Short-circuiting or overheating caused by wet or excessively dusty plugs can result in accidents such electric shocks,files and equipment damage.</p>
 CAUTION	
	<p>After medical treatment, make sure to turn off the water supply valve. Make sure to turn off the air supply valve as well if you will not use the dental treatment unit for a long time or there is a machine trouble. >>A leakage of water/air will occur if you fail to do the above.</p>
	<p>Please observe the following safety conditions. 1)Temperature: -10~70c 2)Humidity : 10~85%RH 3)Air pressure : 700~1060hPa 4)Put it in a the security place. 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. >>Otherwise, damage or injury may result.</p>

(1)After Use

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

OFF



Main Switch
(Green Lamp OFF)

(2)For Extended Shut-down Periods

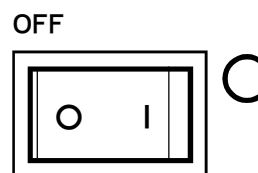
When the unit will not be used for an extended period of time, or in cases when it is not working properly, turn off the main switch and close the main water valve.

Follow the procedure below.

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

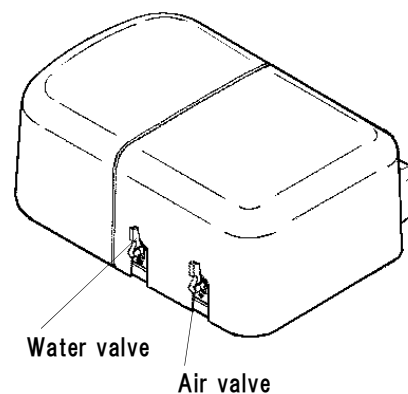
- >>If the auto filler does not turn off
- >>To replace the bacteria filter
- >>When water is leaking from the unit
- >>If the chair is malfunctioning and needs repair
- >>In case of earthquakes, fires, etc.

1)Turn the main switch off.







Main Switch
(Lamp off when OFF)

2)Close the water valve for the plumbing pit



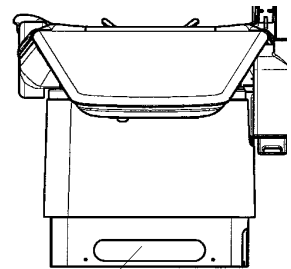
3)Reverse the above procedures to start using the unit again.

18. Fuses

 WARNING	
	<p>Before replacing fuses, always turn off the main switch.</p> <p>>>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>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.</p> <p>>>Continued use could result in accidents or malfunctions due to leaking electricity, or other similar problems.</p>
 CAUTION	
	<p>Always replace fuses with ones of the same type and capacity.</p> <p>>>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.



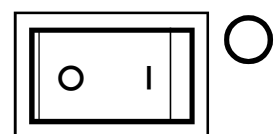
Fuse Cover

- 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.




OFF



Main Switch
(Lamp off when OFF)

[6]Maintenance


WARNING

	<p>Always turn the main switch off before cleaning and performing other maintenance procedures. Also close the air and water valves if necessary.</p> <p>>>Otherwise bodily injury or equipment damage could result from accidental operation, electrical shocks or other types of accidents.</p>
	<p>Always wear surgical gloves to prevent contamination when cleaning and performing other maintenance procedures.</p> <p>>>Otherwise contamination could spread through the entire clinic or hospital.</p>
	<p>All instruments used inside the oral cavity must be cleaned and disinfected without fail..</p> <p>>>Otherwise infections could be spread to patients and workers throughout the clinic.</p>
	<p>When using an autoclave or similar type of disinfection device, follow the instructions in the manual for the instruments being used and disinfected.</p> <p>>>Otherwise, the instruments being disinfected or the disinfection device could be damaged.</p>
<h3> CAUTION</h3>	
	<p>When working inside the basin unit, do not touch the warmer tank or other components that could be hot. Also, do not components inside the housing of the chair unit.</p> <p>>>There is a risk of burns or other injuries. The main power turns off when the basin unit door is opened.</p>

Everyday or As Frequently As Necessary

1. Autoclave Sterilization

CAUTION

	<p>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.</p> <p>If the autoclave uses a very high drying temperature, take the instruments out as soon as they are disinfected.</p> <p>>> Instruments can be damaged by making contact with the interior walls of the sterilization chamber and by excessively high temperatures.</p>
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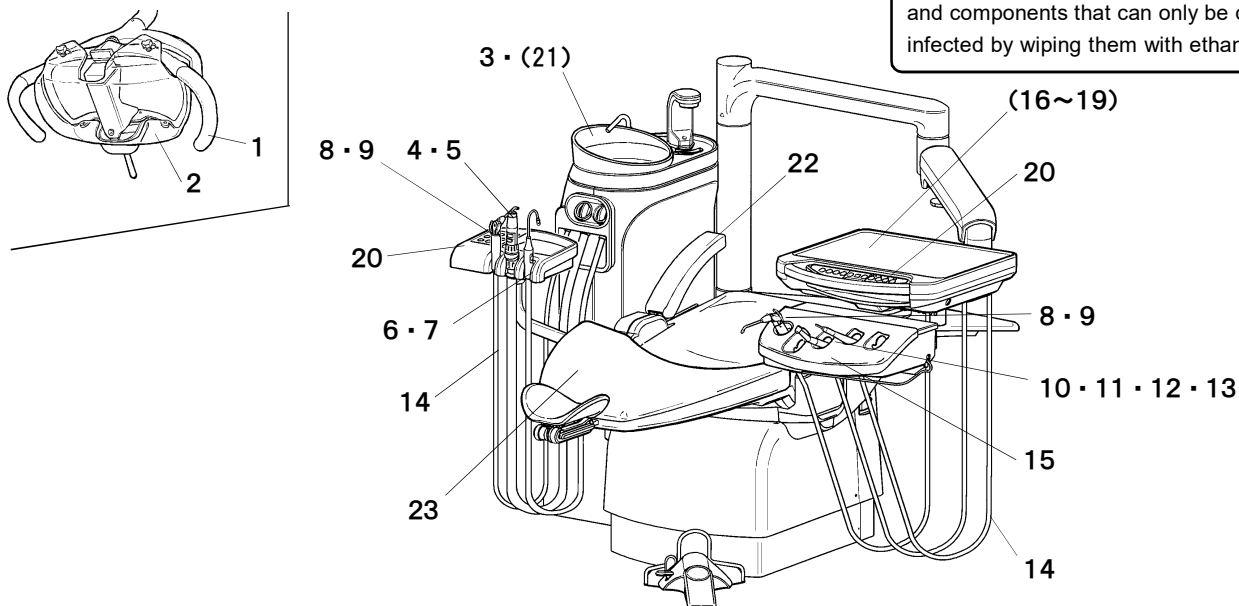
Refer to the list on the following page for which instruments and components may be sterilized by autoclave.

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

<Autoclave Sterilization / Ethanol Disinfection>
Instrument and Component List

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

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



No	Item	No	Item
1	<u>Operating Light Handle Covers</u>	13	<u>Ultra Sonic Scaler Tips and Body</u> *1
2	Operating Light Body surface *2	14	Instrument Tubes
3	Basin, Basin Catch, Basin Nozzle	15	Instrument Holder Top Cover
4	<u>Vacuum Syringe Body</u>	16	<u>Waste Container Stand</u>
5	<u>Vacuum Syringe Tip</u>	17	<u>Silicone Medicinal Bottle Holder</u> *1
6	<u>Saliva Ejector Nozzle</u>	18	<u>Silicone Tray Sheet</u> *1
7	<u>Saliva Ejector Body</u>	19	Contra Stand *1
8	<u>Three-way Syringe Nozzle</u>	20	Dentist's and Assistant's Switch Panels
9	<u>Three-way Syringe Body</u> *1	21	Flushing Bowl *1
10	<u>Air Turbine Handpiece</u> *1	22	Armset (both standard and optional arm rests)
11	<u>Micromotor Attachments</u> *2	23	Leather for Headrest, Backrest and Seat *3
12	<u>Micromotor Motor Cover</u> *2		

*1: Option *2: Difference correspond according to equipment model. Please refer to operator' manual for each product.

*3: No correspondence when selected the special order color.

(1) Sterilization for:

Air Turbine Handpiece
Micromotor Attachment
Ultra Sonic Scaler Tip and Body
Operating Light Handle Cover

This depends on the model; refer to the separate operator' manuals for the instruments installed on your unit.

(2) Sterilization for:

Vacuum Syringe Tip and Body
Three-way Syringe WS-201 Nozzle
Saliva Ejector Nozzle&Body
Waste Container Stand
Silicon Tray Sheet
Silicon Medicinal Bottle Holder

1) Detachment of Autoclavable Components

Refer to section [5] Operation of this manual.

2) Autoclave Temperatures

135°C (maximum). Refer to below recommended condition.

Sterilization Part	Temperature	Time
Vacuum Syringe VS-110 Body and Tip	134 ± 1°C	10 mins above
Saliva Ejector SE-110 Body and Nozzle	134 ± 1°C	10 mins above
Three-way Syringe WS 201 Nozzle (when resolve)	134 ± 1°C	10 mins above
Three-way Syringe WS-97 Body and Nozzle (when resolve)	134 ± 1°C	10 mins above
Waste Container Stand/Silicon Tray Sheet/Silicon Medicinal Bottle Holder	134 ± 1°C	5 mins above




(Depend on Gravity Degassing Model Autoclave)

(3) Silicone Tray Sheet and Medicinal Bottle Holder**1) Autoclave Temperatures**

Recommence condition: 134 ± 1°C, for 5min.

(for the gravity dehydration type autoclave)

2. Ethanol Disinfection

 CAUTION	
	<p>Use only disinfecting ethanol(76.9-81.4vol%). >>Other kinds of alcohols and solvents can cause discoloration or damage the material.</p>
	<p>Do not allow ethanol to seep inside the unit. Be especially careful around openings for joints, shafts and switches. Do not use excessive amounts of ethanol. >>Otherwise, there is a risk of electrical shorts, and also a risk of malfunctions, material fatigue and material damage.</p>

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

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

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

(1)Ethanol disinfection for:

Air Turbine Handpieces

Micromotor Attachments

Ultra Sonic Scaler Tips and Body.

This depends on the model; refer to the separate operation manuals for the instruments installed on your unit.

(2)Other Parts and Components

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

ADVICE

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

3.Other Methods of Disinfection and Sterilization

CAUTION



Do not sterilize any components with dry heat.

>>This could cause discoloration or damage the material resulting in a malfunction.

Do not soak, boil, or wash components with any chemical solutions such as benzene or thinner including disinfecting ethanol.

>>This could cause discoloration or damage the material resulting in a malfunction.

(1)EOG Gas(ethylene oxide gas)Sterilization

The following components may be sterilized with EOG gas:

All autoclavable components (Refer to the list)

(2)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 the Morita Corp. before using sterilization or disinfection methods not referred to in this manual.

4. Cleaning the Basin Unit Component

⚠ CAUTION



Clean the items mentioned as described below at least once a day.
>>Otherwise, the equipment could malfunction, its performance could deteriorate, or lines could become plugged.

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

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

- 1) Turn 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.
Same time, take action while the valve lever in closing situation and open the lever slowly to vacuum.
- 3) Return the instruments to their holders.

(2) Cleaning the Cut Filters

⚠ CAUTION



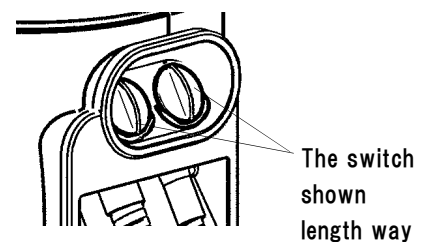
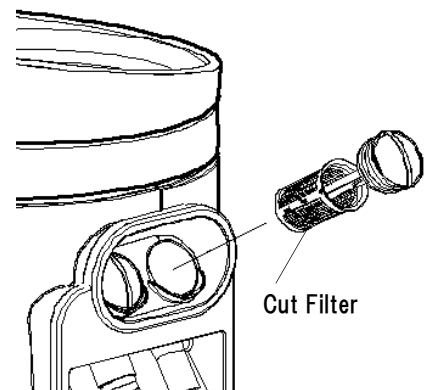
Make sure the Filter is properly and firmly in place when you replace after cleaning.
>>Otherwise the vacuum syringe and saliva ejector will perform poorly, and there is a risk of malfunctions or plugged lines.

Follow the procedure below to clean the cut filter (2 places) at least once a day:

- 1) Take the cut filter off the unit.
Pick the cap head and then unscrew it slowly.
- 2) Separate the cap and the cut filter and then clean each with running water.
- 3) Put the cut filter and the cap together and then put those ones back to the unit. Insert the cap firmly and let each knob vertical.

ADVICE

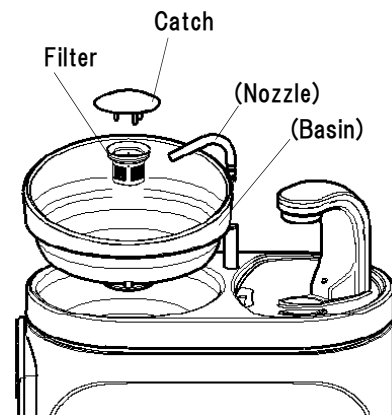
Apply Vaseline to the O-ring at the side of the cap so that the cap goes in and out smoothly.



(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.
Make sure the filter goes all the way in.

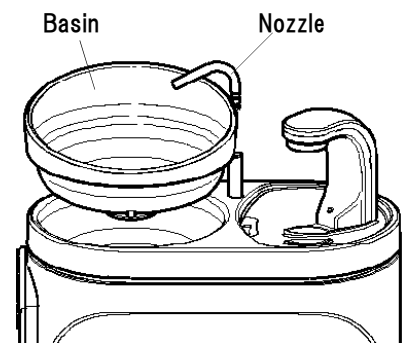


(4)Cleaning the Basin

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

Clean the inside and surrounding surfaces of the basin everyday or as frequently as necessary.
Refer to [5] 7. (4) 3. in this manual for 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 ethanol.
- 2)Wipe the surface with a dry cloth to dry it and remove the cleaner or detergent.



(5)Vacuum System Cleaning

⚠ CAUTION	
!	<p>Use only cleaners recommended by the J.Morita Corp. and follow the instructions that come with the product.</p> <p>>>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 the 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.

>> Water that has been sitting in the warmer tank or the tubes degrades 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 device and flush out the various systems.

Refer to section [5] 7. (1) in this manual.

(2)Manual Flushing

Flushing can also be performed manually.

CHECK

Do not fail 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.

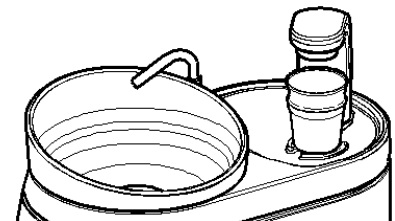
Longer flushing times are recommended to include the water in the main line leading to the treatment unit.

Estimated Flushing Times

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

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.



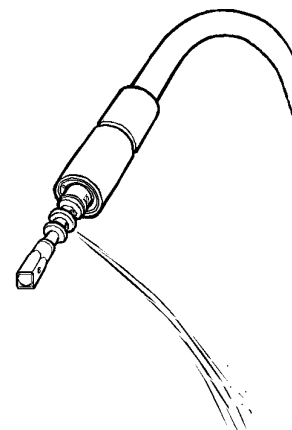
2)Three-way Syringe Flushing

Do both the doctor'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.

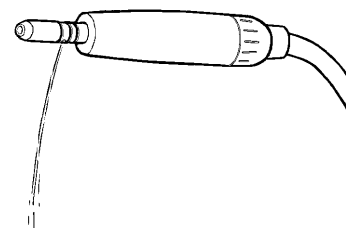
4) Air Turbine

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



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.
- CHECK** Outlet for water of the micromotor is on the side of the connection cylinder. Let the water spout after confirming the position of the outlet.
- 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	
!	<p>The handpiece must always be attached before the scaler is vibrated.</p> <p>>>Otherwise, excessive loads will be applied to the circuit board and other components, and this could result in a breakdown or other malfunction.</p>

- a) Take the handpiece out of its holder and turn on the spray switch.
- b) Hold the handpiece 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 handpiece to its holder.

CHECK Wipe moisture off enough for corrosion and prevention after confirm the abnormality from O-ring, if handpiece connector leakage.

6. Cleaning Other Components and Surfaces

WARNING



Do not allow water, chemical solutions or ethanol 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 ethanol accidentally get on or inside the equipment, turn off the main switch. Then dry the equipment off thoroughly.

>>Otherwise, there is a risk of an accident due to a short circuit or equipment damage such as discoloration or damage to materials leading 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 ethanol could cause discoloration or other types of damage resulting 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.

>>This 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 ethanol. Take care that none of the ethanol seeps inside the unit.

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

(1) Leather Seat and Backrest 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 contacts 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 ethanol*.
- 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 backrest covers may not be disinfected with ethanol. If necessary, leather coverings can be replaced for a standard fee. Contact your local dealer or the J. Morita Corp. for details.

(2) Other Components and Surfaces

Clean as frequently as necessary.

Refer to section [5] Operation in this manual for 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 Cleaning

⚠ CAUTION



Use the procedure of manual to inspect the vacuum tank at least once a month.

>>Otherwise, the performance could deteriorate, these instruments could malfunction or their lines could get plugged up.

After cleaning make sure the vacuum tank and its flexible drain tube are properly 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 clean the vacuum tank at least once a month. This is not necessary if the unit is not equipped with a vacuum tank or an air vacuum.

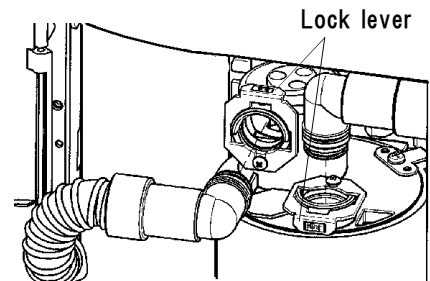
(1) Turn off the main switch and open the basin unit.

(2) Detach the two flexible tubes from the tank holder.

Hold the end of the tube and then pull out the tube, pressing the lock lever.

ADVICE

It is recommended that you prepare a floor cloth when detaching the tubes from the tank holder because water may run out of the tubes.

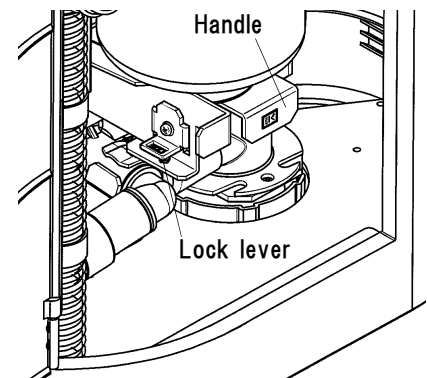


(3) Take the vacuum tank and the tank holder out of the unit.

Pull the handle, pressing the lock lever.

ADVICE

Watch out the internal sewage spills because in the same time pipe line under the tank will come off while you pulling the tank.



(4) 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.

(5) Wash the tank inwall with running water.

(6) Wash the bottom of vacuum tank and the valve plate with running water. Loosen the thumb screw to take off the bottom of vacuum tank, and then clean both faces of the valve plate and inner wall of the bottom of tank.

(7) Wipe each part well after finishing cleaning.

ADVICE

Connecting a wet part into the inside of the unit will cause trouble and rust.

(8) Put the bottom of vacuum tank back to the vacuum tank.

After fixing the valve plate to the vacuum tank, insert the bottom of vacuum tank to the vacuum tank, and then fix it with the thumb screw.

(9) Put together the tank holder and the vacuum tank into an original form.

After fitting the tank holder and the vacuum tank well, rotate it clockwise until the tab on the side of the tank holder is secured to the vacuum tank.

ADVICE

Apply Vaseline to the O-ring at the side of the tank holder if the tank holder does not fit the vacuum tank well.

(10) Connect the assembly of the vacuum tank and the tank holder to the unit.

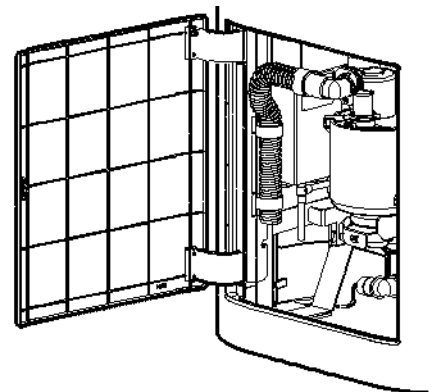
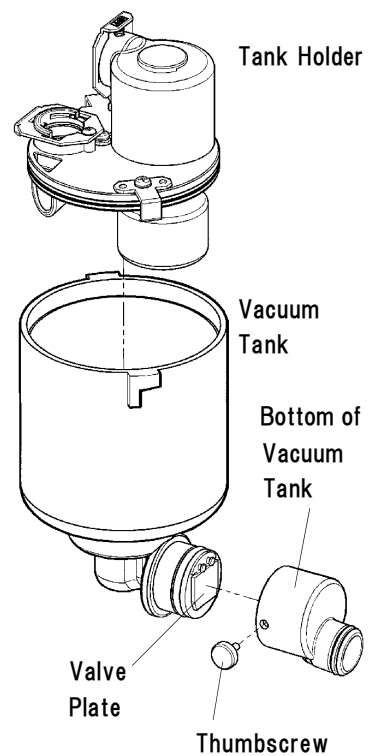
Insert the assembly to the unit straight along right and left rails, and then push it until you hear the left lock lever click.

(11) Connect the two flexible tubes to the unit. Insert the tubes into the tank holder straight, holding the end of the tube. Push it until you hear the lock lever click.




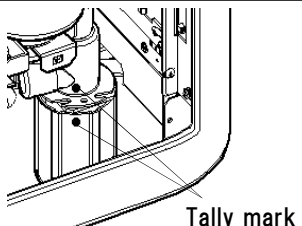
(12) Close the basin unit door.

CHECK

After cleaning, check if the vacuum operates properly.



8. Clean the Drain Trap

 CAUTION	
	<p>Clean the drain trap at least once a month. >>Otherwise performance could deteriorate the vacuum could malfunction or the vacuum lines could get plugged up.</p> <p>After cleaning make sure the drain trap filter, cap and sleeve are properly and securely installed. >>Otherwise drain water could leak resulting in damage or a malfunction.</p>
	<p>Do not screw over the cap of drain trap. >>It could damage if screw hardly, and surpass the tally mark (refer to right graph), idle running or come off from the cap. Again, it could caused water leakage.</p> <div style="text-align: right;">  <p>Tally mark</p> </div> <p>Do not insert the drain trap filter holder while it on the upward. >> The drain trap filter becoming difficult to detach while inversely set, or the cap can not screw on the right position. It will cause water leakage.</p>

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

Follow the procedure to process.

- (1) Raise the chair about 100cm above its lowest position and turn off the main switch.

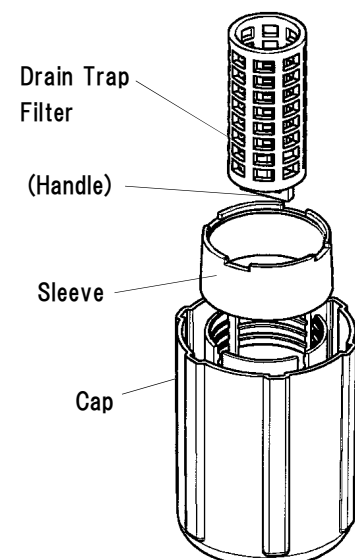
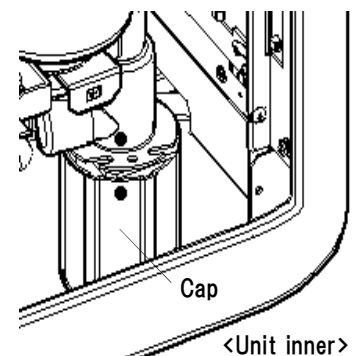
ADVICE

Place a bucket under the trap to catch the water that will still be inside the cap.

- (2) Unscrew the cap on the bottom of the unit; turn it to the left and take it off.

- (3) Take out the drain trap filter. Hold the small handle on the filter and pull it straight down.

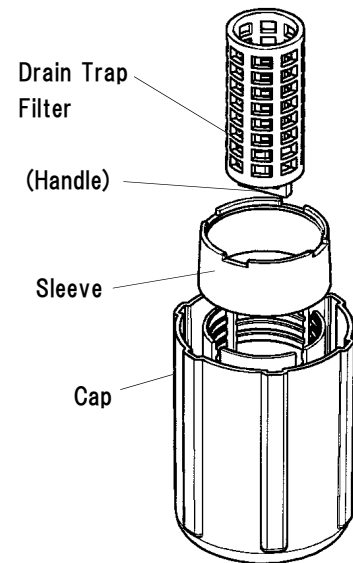
- (4) Throw away the drain water inside the cap and wash the cap, the drain filter and the sleeve with running water.



(5) Replace the drain filter in its original position. Put the filter in the cap with its handle facing down and replace both the cap and the filter at the same time.

CHECK

Ensure the filter holder is facing down in advance.

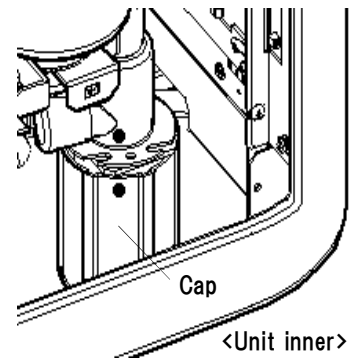


(6) Put the sleeve on and then screw the cap back into place.

Hold the cap straight so that the threads do not get jammed and then screw it all the way to the right.

CHECK

Screw it until fit the tally mark position.



(7) After cleaning, close the door and pour 2 cups of water into the basin to rinse out the trap.

ADVICE

Pouring water down the drain will fill the trap up so the nasty odors do not come up through the drain.

CHECK

Ensure there is not leakage from the trap.

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 properly.

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 handpieces and hold your hand near the support column for the handpiece to see if air is coming out.

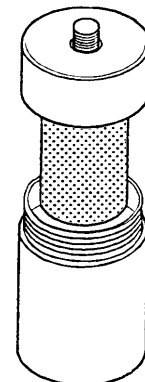
CHECK

If the exhaust air does not flow properly, stop using the handpiece and contact your local dealer or the J. Morita Corp.

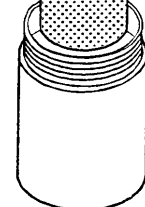
More water will tend to mix with the exhaust air if the o-rings on the connection end of the air turbine handpiece are broken. Make sure these o-rings are in good shape.

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

Filter Case Top

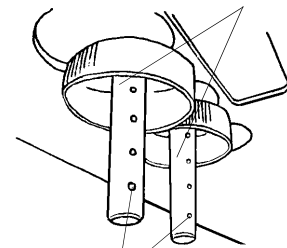


Oil Drain Filter



Filter Case Body

Filter Support Columns



Filter Support Columns
Air Holes

10. Clean and Dismantle of Vacuum Syringe/Saliva Ejector

⚠ CAUTION



Do not conduct ultrasonic cleaning for disassembled parts of the adjustment lever. Also, do not rub the surface of the parts with a sharp apparatus.
 >>Surface of the parts can be damaged, and it would disturb to movement.

Once in a month or in case the movement of the suction adjustment part goes sticky or hard, clean disassembled parts of the vacuum syringe.

(1) Detach the body from the main tube.

(2) Disassemble the body as a right illustration and take the drum off.

(3) Clean each part with running water.

Remove harden substances adhering to each part carefully with a toothbrush.

In the case of SE-110, check the state of the O-ring at both ends of the drum. If there are transformation, hardening and deficiency on the O-ring, replace it with a new one.

CHECK

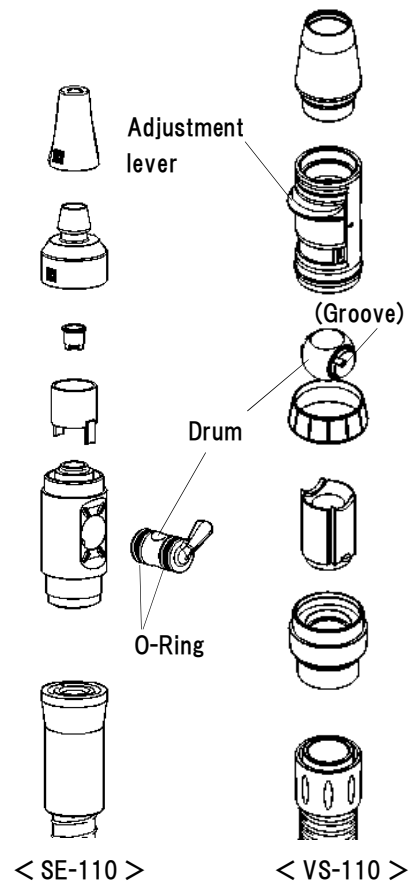
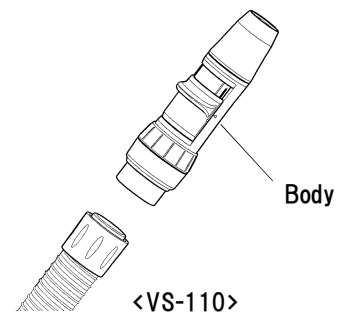
(4) Reassemble the parts into an original form.

ADVICE

The lever will move smoothly if you apply a small quantity of Vaseline is to the drum.





CHECK

As for the VS-110, Insert the drum into the body so that the grooves of the drum and the guide inside the body fit. Then check the drum and the lever are linked together.



Once a Year

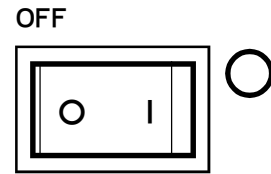
11. Replacing the Baterial Filters and their Cases

	<p>Keep fingers clear of the electric panel and electric components inside the plumbing pit and do not get this parts wet. Also never move the chair while the plumbing pit is opened up. >>Any of the above actions could result in electric shock, shorts, pinching or other injurious accidents.</p>
	<p>Before taking the bacteria filter cases off, do not fail to release the internal pressure as described below. >>Forcing the cases off could result in sudden breakage causing an injury.</p>
	<p>Do not mix up the air and water filters. >>Make sure the filters and their cases are properly and securely installed.</p>
	<p>Before beginning replacement, make sure the water and air supply valves are turned off. >>Otherwise, water and air leakage will occur.</p> <p>Wear surgical gloves and other protective clothing when replacing the bacteria filters. >> Used filters could be highly contaminated. Also touching new filters could impair their effectiveness.</p> <p>Replace both the filters and their cases at the same time once a year. >> Otherwise performance could be degraded, lines could plug up, 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>Make sure both the filters and their cases are securely and properly installed. Slide the filters all the way onto their holder. Tighten the cases securely. >>Otherwise, there are risks of water leakage, damage, and malfunction.</p>

For the equipment of bacteria filter, replace it once a year (water/air) with filter case.

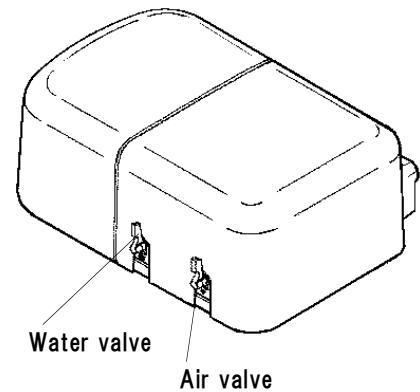
Use the procedure below to replace the filters.

(1) Raise the chair to the position where the pit cover can be taken off and then turn the main switch off.



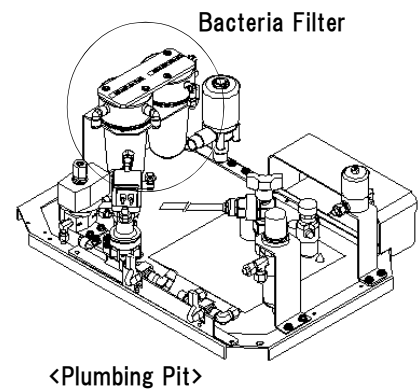
Main Switch
(Lamp off when OFF)

(2) Turn off the water and air supply valves of the plumbing pit to cut off the supply of water and air.



(3) Run water and air from the threeway syringe to release the pressure in the lines.

(4) Take the pit cover off the plumbing pit.
Lift up the pit cover upright.



(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.

Make sure the new filters are firmly in place.

CHECK

Ensure the O-ring is fitting in right way before insert.

(7) Install the new cases onto the holders. Carry the case and turn right until screw.

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 the main valves, turn the unit on and operate the three-way syringe.

CHECK

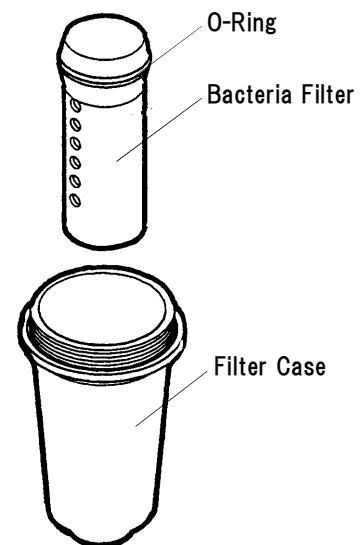
Make sure the air and water come out normally and that there is no leakage around the filter cases.

(9) Turn off the main switch and put the cover back on the plumbing pit.




(10) Turn the main switch on and make sure everything works properly.

ADVICE

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



[7] Inspection

 WARNING	
	<p>For safety and optimum performance, inspect the equipment regularly and conscientiously according to the instructions in this manual.</p> <p>>>Otherwise there is a risk of accidents resulting in bodily injury or damage to equipment.</p>
	<p>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.</p> <p>>>Otherwise there is a risk of accidents resulting in bodily injury or damage to equipment.</p>
	<p>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.</p> <p>>>Haphazard disassembly, repair or modification could be extremely dangerous.</p>
	<p>Regularly inspect and clean the main plug and socket connection (including the ground connection).</p> <p>>>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>No modification of this equipment is allowed.</p> <p>Do not modify this equipment without authorization of manufacturer.</p> <p>If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of the effect.</p> <p>>>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 List)
3	Check that chair emergency stop works properly. (See section [5] 3. (2) in this manual.)	Check that chair emergency stop and safety switches work properly.	[5]3.(2) 1., 3.
4	Check for drain, air and water leakage (look for wet spots or stains and listen for the sound of escaping air)	Check all connections and repair if necessary.	[4] [6]11.
5	Check the base and plumbing pit housing for scrapes, proper installation, tilting, and abnormal noise.	Inspect visually and by moving the chair.	[6]11.
6	Make sure 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 make sure changeover, display and operation are all normal. Also check the Clean System.	[5]2. ~ 6
7	Make sure various functions and equipment such as the auto filler, basin, 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	Make sure 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 the 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 \ SUU	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 Type G20 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] 12.
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, backrest, headrest, 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 following before requesting repair

Problem	Possible Cause	Response	Reference
>> No power when main switch is turned on.	1. Power Plug was come out	Connect the plug rightly with socket.	[5]15.
	2. Blown fuse.	Replace fuse	[5]16.
>> Seat or backrest does not move	1. Emergency stop activated	Remove obstacles etc. and cancel emergency stop.	[5]3.
	2. Temporary malfunction due to electrical noise etc.	Turn OFF the main switch and switch ON again.	[5]15.
>> Backrest moves when foot pedal is depressed	1. Attempt to over-ride the emergency stop	Remove obstacles etc. and cancel emergency stop.	[5]3.
>> Switched and instruments do not work at all	1. Interlock inside basin unit has been activated	Switch OFF the interlock switch.	[5]9.
>> Panel switches do not work properly (cannot changeover etc.)	1. Pressing another switch simultaneously	Press only one switch once a time.	-
	2. Another switch is being held down	Check all switches on the panel.	
>> Micromotor does not rotate	1. Fuse blown	Replace micromotor fuse (8A).	[5]16.
>> Dentist's instrument does not work	1. Select others instrument	Ensure the instruments selection function at dentish's switch panel monitor display.	[5]3.
>> No suction or weak suction for vacuum syringe or saliva ejector	1. Cut filter or vacuum tank need cleaning	Clean filter or tank.	[6]4. [6]7.
	2. Cut filter or vacuum tank are not properly connected (Connection is not tight enough)	Connect all components properly.	
>> Basin does not drain properly	1. Drain trap filter needs cleaning	Clean filter.	[6]8.
>> Auto filler does not supply water	1. Sensor on surface needs cleaning	Clean filter.	[5]8.

[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 free of charge. However, the user may have to bear the expense of components not covered by the warranty such as parts which 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 expenses of the 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 which could possibly be contaminated must be first decontaminated by the responsible doctor or medical institution and then be disposed by an agent licensed and qualified to handle medical and industrial waste.

Even devices and equipment that is not consider to be a contamination risk must be disposed of according to local laws and regulations.

[11]Specifications

General Designation	Dental Treatment Unit
Name	Signo G20
Model	TU110
Intended purpose	This product, installed in a dental clinic, locates a patient to a position for medical examination, delivers air, water, vacuum, and electricity to dental equipment which is intended to be attached and operates it, and supplies and drains water for rinsing out patient's mouth.
Classification	Medical Device Administration
Rating	220 / 230 / 240V AC
Frequency	50 / 60 Hz
Power Consumption	1.5 kVA
Weight of Body	Approx. 240 Kg
Load Weights	Seat: approx. 1350N (135kg) Backrest: approx. 800N (80kg)
Seat Elevation Mechanism	Hydraulic Vertical Elevator
Seat Height	750mm (max.) 450mm (min.)
Backrest Angle	Raised : $78 \pm 2^\circ$ Lowered : $2 \pm 2^\circ$

Electric shock protection	Class I (permanent installation) Type B with applied device
Repair Classification	G7
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)
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, Headrest, Backrest, Armrest, 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:700-1060 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.

[12] EMC Technical Description

 WARNING	
	This product requires precautions related to EMC and it is necessary to install and use the product according to the EMC information described in these operation instructions.
	Portable and mobile RF communication equipment may affect this product.
	Portable RF communications equipment should be used no closer than 30cm (12 inches) to any part of the TU110, otherwise, degradation of the performance this equipment could result.
	If accessories other than those sold as replacement parts by the marketing authorization holder are used, performance of this product may deteriorate regarding EMC.
	The use of accessories and cables other than those specified, with the exception of replacement parts sold by J. MORITA TOKYO MFG CORP. may result in increased emissions or decreased immunity of the TU110.
	Where possible this product should not be placed adjacent to other equipment, and should not be use with other equipment. If use with other equipment is required, only proceed after observing that the unit and other equipment work properly together.

Guidance and manufacturer's declaration-electromagnetic emission

**The TU110 is intended for use in the electromagnetic environment specified below.
The customer or the user of the TU110 should assure that it is used in such an environment.**

Emission test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group-1	The TU110 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. The TU110 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.
RF emissions CISPR 11	Class-B	
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 TU110 is intended for use in the Electromagnetic environment specified below.
The customer or the user of the TU110 should assure that it is used in such an environment.**

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge(ESD) IEC 61000-4-2	± 8 kV contact ± 2 , ± 4 , ± 8 , ± 15 kV air	± 8 kV contact ± 2 , ± 4 , ± 8 , ± 15 kV air	Floors should be wood, concrete or ceramic tile, if floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-2	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, basic EMC standard or test method: IEC 61000-4-11	0% UT : 0.5 cycle At 0° , 45° , 90° , 135° , 180° , 225° , 270° and 315°		Professional healthcare facility environment
	0% UT : 1 cycle and 70% UT: 25/30 cycles Single phase: at 0°		Professional healthcare facility environment
Voltage interruptions, basic EMC standard or test method: IEC 61000-4-11	0% UT: 250/300 cycles		Professional healthcare facility environment
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	30A/m	30A/m	Power frequency magnetic field should be at least characteristic of a typical location in a typical commercial or hospital environment. IEC 61000-4-8

NOTE: Ut is the a.c. mains voltage prior to application of the test level

Guidance and manufacturer's declaration-electromagnetic immunity

**The TU110 is intended for use in the Electromagnetic environment specified below.
The customer or the user of the TU110 should assure that it is used in such an environment.**

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
<p>Conducted RF IEC 61000-4-6</p>	<p>3Vrms (c) 150KHz to 80MHz outside ISM bands</p> <p>6Vrms (c) 150kHz to 80MHz inside ISM bands</p>	<p>3Vrms 150KHz to 80MHz</p>	<p>Portable and mobile RF communications equipments should be used no closer to any part of the TU110, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance $d = 1.17 \times \sqrt{P}$ $d = 1.17 \times \sqrt{P}$ 80MHz to 800MHz $d = 2.33 \times \sqrt{P}$ 800MHz to 2.7GHz 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 metre(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</p> 
<p>Radiated RF IEC 61000-4-3</p>	<p>3V/m 80MHz to 2.7GHz</p>	<p>3V/m 80MHz to 2.7GHz</p>	

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 TU110 is used exceeds the applicable RF compliance level above, the TU110 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary. Such as reorienting or relocating the TU110.

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

(c) The ISM(industrial, scientific and medical) bands between 150kHz and 80MHz are 6.765MHz to 6.795MHz; 13.533MHz to 13567MHz; 26.957MHz to 27.283MHz; and 40.66MHz to 40.7MHz.

**Recommended separation distances between
Portable and mobile RF communications equipment and the TU110**

The TU110 is intended for use in the Electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the TU110 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the TU110 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 2.7GHz $d = 2.33 \times \sqrt{P}$
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 meter(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 higherfrequency 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 tecnicl 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.

Attachment 1.

**Test specifications for ENCLOSURE PORT IMMUNITY to
RF wireless communications equipment**

Test Frequency (MHz)	Band ^{a)} (MHz)	Service ^{a)}	Modulation ^{b)}	Maximum Power (W)	Distance (M)	IMMUNITY TEST LEVEL (V/m)
385	380 - 390	TETRA 400	Pulse modulation ^{b)} 18Hz	1.8	0.3	27
450	430 - 470	GMRS 460, FRS 460	FM ^{c)} ± 5kHz deviation 1 kHz sine	2	0.3	28
710	704 - 787	LTE Band 13, 17	Pulse modulation ^{b)} 217 Hz	0.2	0.3	9
745						
780						
810	800 - 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation ^{b)} 18 Hz	2	0.3	28
870						
930						
1720	1700 - 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4,25; UMTS	Pulse modulation ^{b)} 217 Hz	2	0.3	28
1845						
1970						
2450	2400 - 2570	Bluetooth, WLAN, 802. 11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation ^{b)} 217 Hz	2	0.3	28
5240	5100 - 5800	WLAN 802.11 a/n	Pulse modulation ^{b)} 217 Hz	0.2	0.3	9
5500						
5785						

NOTE If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the ME EQUIPMENT or ME SYSTEM may be reduced to 1 m. The 1 m test distance is permitted by IEC 61000-4-3.

^{a)} For some services, only the uplink frequencies are included.

^{b)} The carrier shall be modulated using a 50 % duty cycle square wave signal.

^{c)} As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Basic performance: none

Intended behavior

Cable length

Main tube: about 1.5 m

Foot control: about 700 mm

Three-way Syringe Output:

Vacuum Syringe Performance: Volume: 90 L / min., minimum

Water and Spray: 30mL / 15sec., minimum

It depends on the vacuum motor.

(Reference value)

Volume: 140 L / min., minimum

(with EV-12 Type II)

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