NSK

Dental Mobile Unit

VIVA ace

VIVA ace Basic Set

OPERATION MANUAL

Please read this OPERATION MANUAL carefully before use, and file for future reference.

CE 0197 MADE IN JAPAN

OM-E0798E 000

Thank you for purchasing VIVA ace Basic Set.
This product is a Portable Dental Treatment Unit used for on-site patient treatment.
Please read this Operation Manual carefully before use so that you can use it safely to come through a correct use.
Keep this Operation Manual within easy reach of users for future reference.

Contents

Operation procedure of this product is introduced in a movie.
Check the URL or the QR Code.

URL
http://www.nsk-dental.com/support/videos/

* The basic function of this product is Vacuum and Syringe.
  Additional function is available by purchasing optional parts (VIVA ace Motor Kit, VIVA ace Scaler Kit).
  Refer to the attached Operation manuals for further information.

1 User and Indications for Use

User : Dentist, Dental hygienist
Indications for Use : The device is a dental suction system intended for dental treatment. The device is equipped with the functions of vacuum and irrigation and used by connecting motor and ultrasonic scaler.
The motor is intended for teeth and denture cutting, polishing and root canal treatment.
The ultrasonic scaler is intended for use in dental applications such as scaling, root canal treatment, periodontal and cavity preparation by generating ultrasonic waves.

2 Precautions for handling and operation

- Please read these precautions carefully and use only as intended or instructed.
- Safety instructions are intended to avoid potential hazards that could result in personal injury or damage to the device.
  Safety instructions are classified as follows in accordance with the seriousness of the risk.

Class	Degree of Risk
⚠ DANGER	Hazard that could result in personal death or serious injury if the safety instructions are not correctly followed.
⚠ WARNING	Hazard that could result in serious injury or damage to the device if the safety instructions are not correctly followed.
⚠ CAUTION	Hazard that could result in light or moderate injury or damage to the device if the safety instructions are not correctly followed.
NOTICE	General product specification information highlighted to avoid product malfunction and performance reduction.

⚠ DANGER

- To prevent secondary infection due to droplet/air of the Vacuum do not use these products for patients with significant infection.
- Do not attempt to disassemble the product nor tamper with the mechanism except as recommended by NSK in this Operation Manual. This may result in an injury, electric shock or fire.
- Do not handle the power cord, motor cord and scaler cord with wet hands. Wet hand contact with electricity may result in an electric shock.
- Do not use power cords other than genuine products made by NSK. Use of other cords may result in electric shock, fire or breakdown. Do not connect any other accessories that are not specified by NSK.
- Stop using the product and contact your Authorized NSK Dealer immediately if deformation, damage, or discoloration of the exterior of the control unit is observed. This may result in an electric shock and fire.
- If the product overheats or smells of burning, immediately turn off the power and disconnect the AC power cord. Contact your Authorized NSK Dealer. This may result in an electric shock and fire.
- Take care not to get water or liquid disinfectant in the control unit during use. This could cause short circuits and lead to an electric shock.
- Always check the Vacuum operates thoroughly and test suctioning. Adjust the suction force and the water amount according to the patient's condition. Refer to P58 "12-1 Specifications" for the suction force and suction amount for the Vacuum.

⚠ WARNING

- Do not use the product when the patient or the operator is using cardiac pacemakers as there is a danger that it may affect the pacemaker.
- Keep away from explosive substances and flammable materials. Also, keep away from patients whom a flammable anesthetic (eg. laughing gas) is administered as this may cause fire.
- Keep away from devices that generate electromagnetic waves as electromagnetic waves may cause malfunction of the product. Turn off the product around ultrasonic generators (excluding the product) or electrical scalpels. Keep away from communication equipment or elevators that generate electromagnetic waves.
- Do not turn the lighting of the handpiece, motor cord, or scaler cord directly to the eyes of the patients or the operators. There is a danger that this may damage the eyes.
- Never touch the connecting parts (the terminal parts) of the scaler handpiece, scaler cord, motor, motor cord, and control unit. This could cause an electric shock.
- This product is a precision instrument. During transportation of the product, do not allow any strong impact or shock to the product, or do not drop the product. This may cause product breakage, leading to an electric shock or failure.
- Before replacing the fuse, be sure to turn off the power switch and remove the AC Power Cord. (Reference:10-7 Replacing the fuse) If you touch the patient and the contact point inside the fuse insertion port simultaneously without taking the procedures above, it may lead to an electric shock.

⚠ CAUTION

- When operating the product always consider the safety of the patient.
- Use only as indicated.
- The end user shall be responsible for any judgment that relates to the application of this product to a patient.
- Users are responsible for the operational control, maintenance and periodical maintenance checks of this product.
- This device is for indoor use only.
- Wait before turning on and using the VIVA ace, until it has adapted to the ambient temperature (E.g. after a cold night in the car). Note the admissible operation conditions (Reference: 12-1 Specifications).
- Keep the product on a level surface.
- Do not place nor leave the product in high-temperature places such as in direct sunlight, inside a car under blazing sun, and near the heaters. This could cause discoloration and deformation.
- Use of the product outside its use environment and condition may cause breakdown. (Reference : 12-1 Specifications)
- Operators and all others in the area must wear eye protection, a mask, and gloves when operating this product.
- Turn off the product after using. Unplug the product when not using for a long-time period.
- If the product is not used for a long period, check it is functioning correctly before using on a patient.
- Immediately wipe off any liquid medicine, solvent, or liquid disinfection on the control unit and cords. Failure to do may cause discoloration and deformation.
- Hold the plug when unplugging the cords. Unplugging holding the cords may cause breaking down of the cord.
- Should the product function abnormally, cease operation immediately and contact your Authorized NSK Dealer.
- Place the product with approximately 15cm space around the product and in a position where power cords can be promptly unplugged from the power outlet in case of an emergency.
- Do not block the air outlets on both sides of the control unit as this may cause malfunction.
- The power cord is 2 meters long. Pay attention that the operator and the patient do not carelessly step on the cord.
- Do not clean, immerse, or wipe with electrolyzed-oxidizing water (strong acidic water, super acidic water), strong acidic and strong alkaline liquid medicine, solvent containing chlorine, benzene, or thinner. (Reference : 7 Post-use Maintenance)
- Do not use tap water for the product as water tubes will get clogged with impurities in tap water. Be sure to use drinking water.
- The Syringe Nozzle and the Suction Tube are delivered in a non-sterile condition and must be autoclaved prior to use. Follow any additional local directives, standards, and guidelines for cleaning, disinfection, and sterilization.
- Perform regular function and maintenance checks. (Reference : 10-10 Periodical Maintenance Checks)

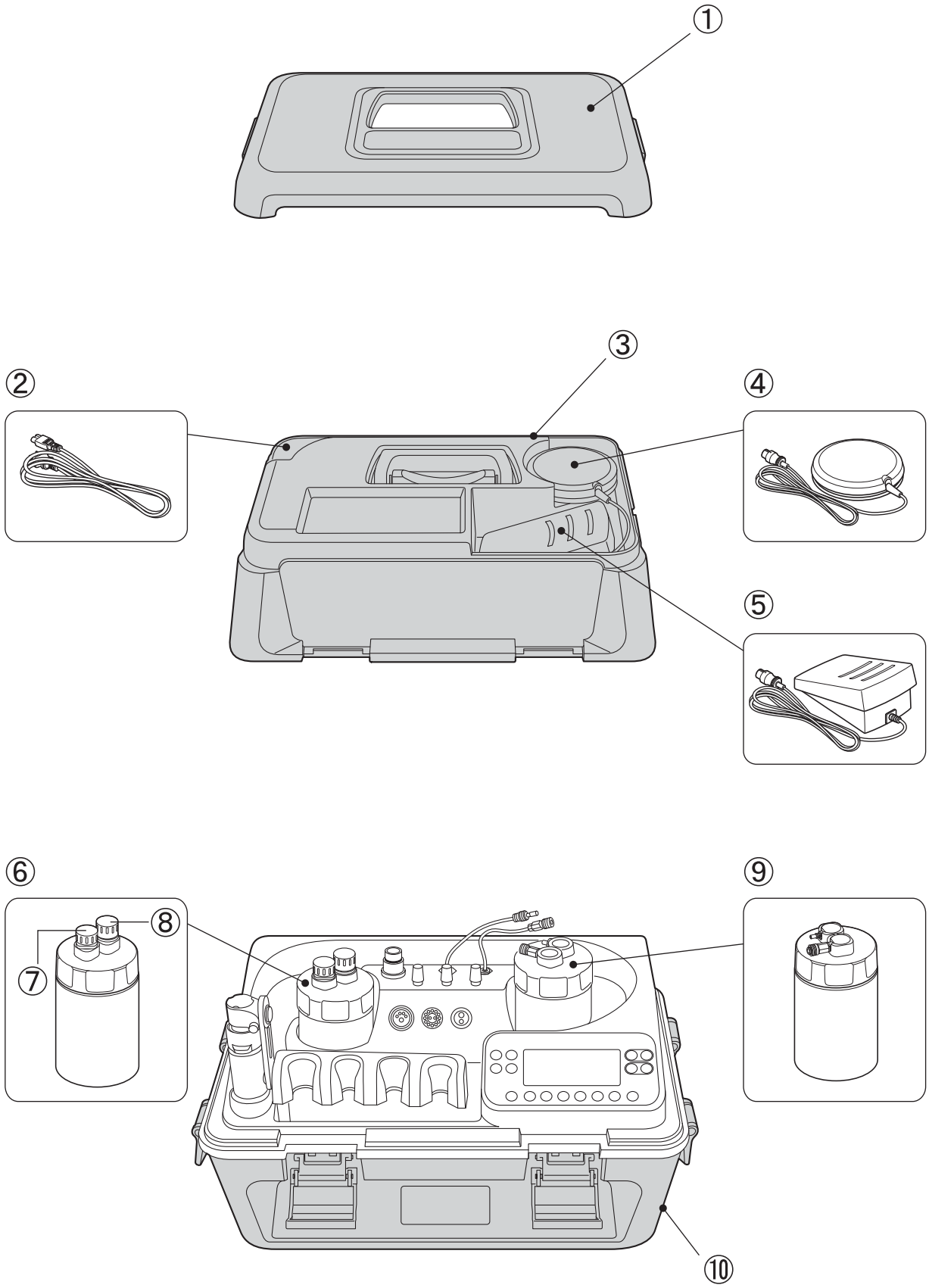
⚠ CAUTION

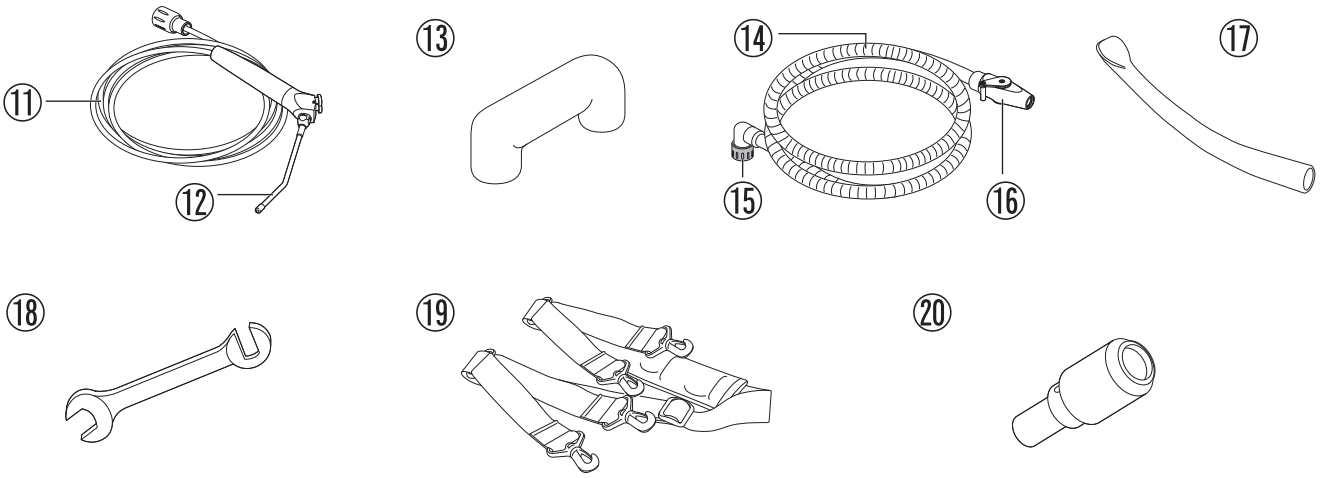
- The use of ACCESSORIES, other than those specified by the manufacturer, may result in performance degradation of electromagnetic compatibility (EMC), increased EMISSIONS*1 or decreased IMMUNITY*2, of the product.
  *1: Electric noise (Mainly electromagnetic wave)
  *2: Not to be obstructed by the electromagnetic wave generated by the electrical equipment.
- This product is rated Medical Electrical equipment. EMC (Electromagnetic compatibility) is described in the documentation included.
- Installation and use of this product requires special precautions regarding EMC according to the EMC information.
- Portable and mobile RF communications equipment can affect Medical Electrical equipment. Do not use RF equipment near the product.
- This product should not be used adjacent to, or stacked with, other equipment. If adjacent or stacked use is necessary, this product should be observed to verify normal operation in the configuration in which it will be used.

NOTICE

- Before the first use of the product, check the operation and storage of the product.
- Perform an operation check before visiting treatment.
- The compressor will be turned on when turning on the power and during idling to maintain the setting pressure. This is not a failure.
- When idling, the Vacuum constantly performs weak suction. This is not a breakdown.
- Contact your Authorized NSK Dealer for repairing. The service staff of the company will take care of the product in accordance with the service manual.
- No special training is required for this device.
- For the cautions, operation procedures and the maintenance of the optional products; VIVA ace Motor Kit, VIVA ace Scaler Kit, refer to the Operation Manual attached to each product.
- This product cannot connect an amalgam separator to the disposal system. When performing amalgam filling/removing, use a suction device with amalgam separation function.

3 Package Contents



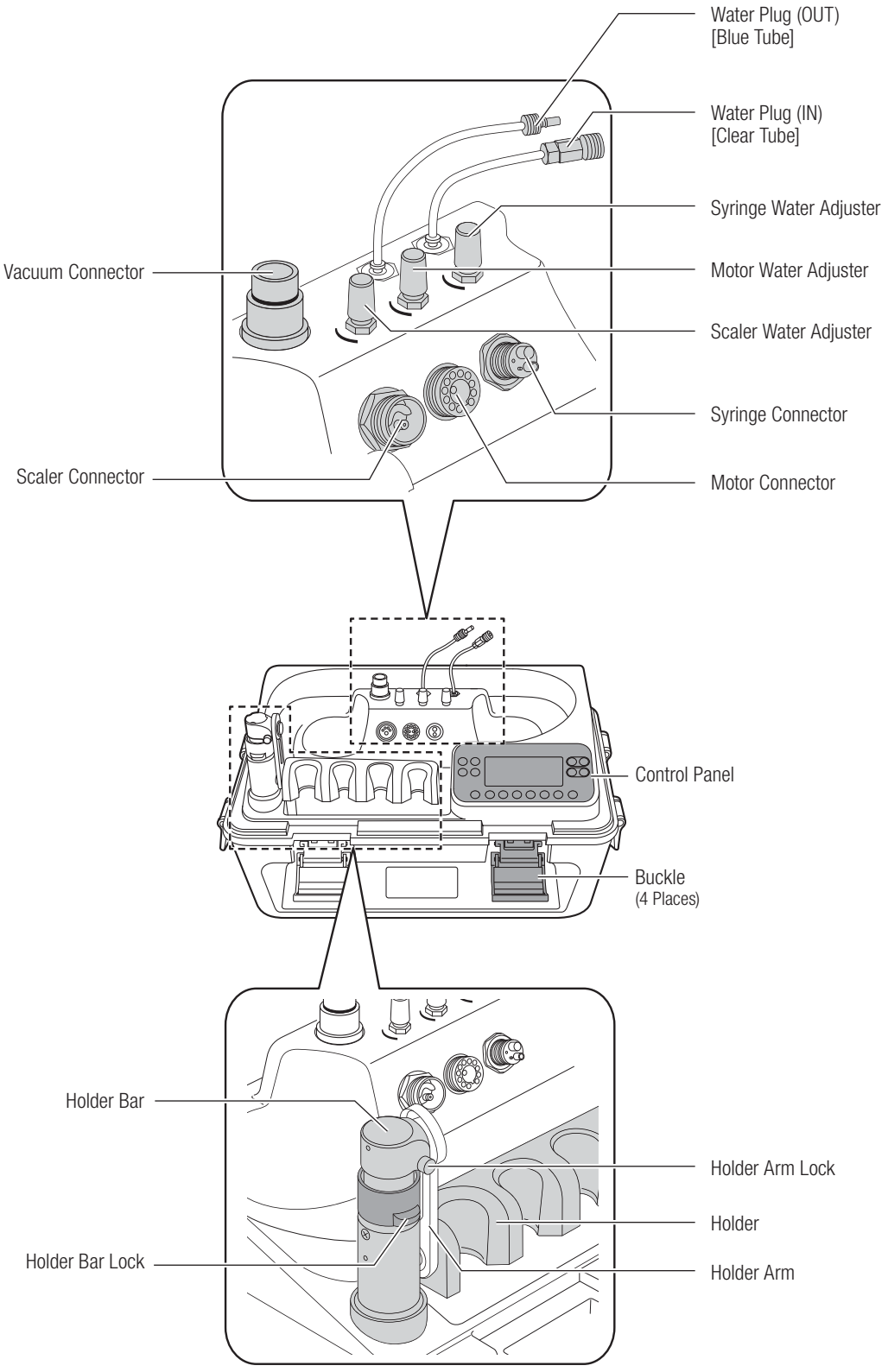


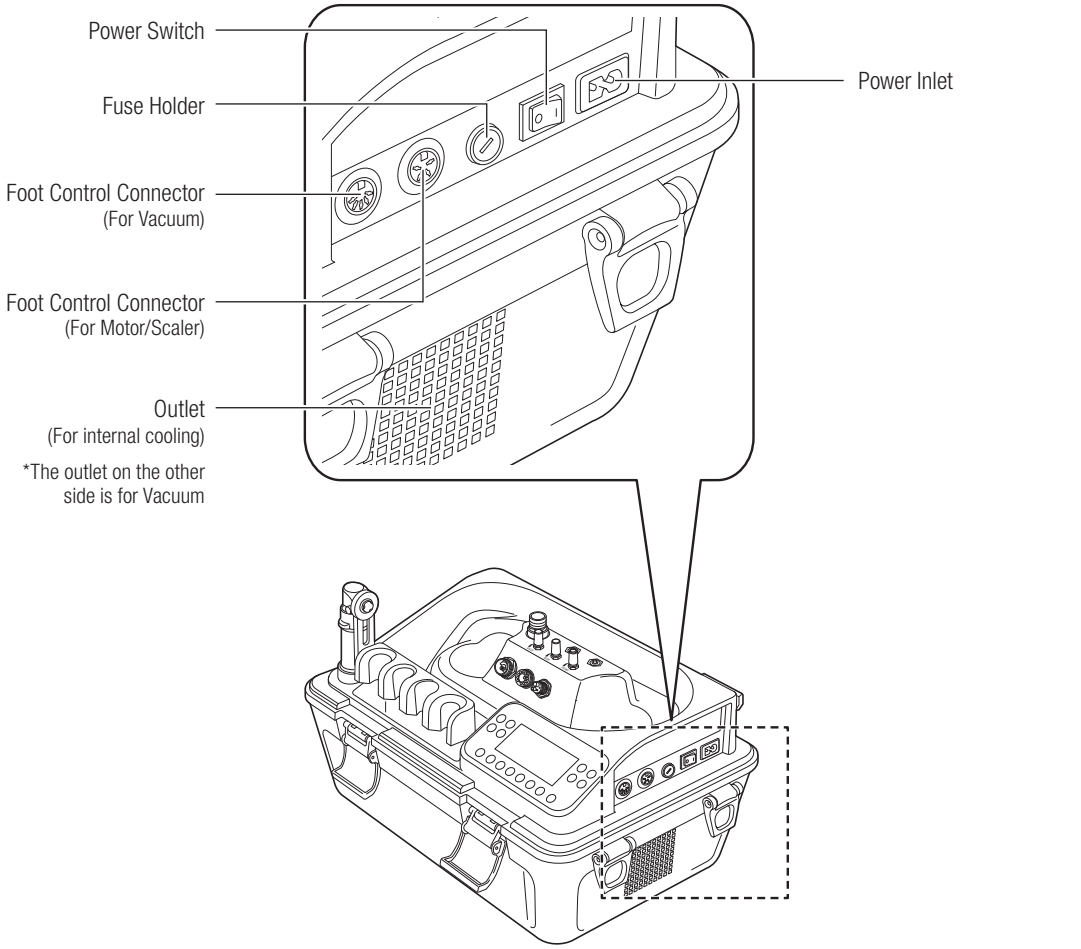
No.	Part Name	Order Code	Quantity	Remarks
1	Top Case Cover	-	1	-
2	AC Power Cord	U439550	1	-
3	Top Case	-	1	-
4	Foot Control	Z1008006	1	FC-70S (For Vacuum)
5	Foot Control	Z1082005	1	FC-76S (For Motor and Scaler)
6	Vacuum Bottle Set	U1146070	1	-
7	Vacuum Cap A	U1144750	1	White, Convex shape
8	Vacuum Cap B	U1144751	1	White, Concave shape
9	Water Bottle Set	U1146080	1	-
10	Control Unit	-	1	-
11	3way Syringe	-	1	-
12	3way Syringe Nozzle	U1144046	1	Sterilizable
13	Vacuum Junction Hose	U1144753	1	-
14	Vacuum Hose	U1144076	1	-
15	Hose Cap	U1144752	1	Black
16	Vacuum Valve	U1144079	1	-
17	Suction Tube	-	10	Sterilizable
18	Spanner	Z103119	1	-
19	Shoulder Belt	U1144370	1	With a pad
20	Cleaning Adaptor	U1144097	1	-
21	Quick Operation Guide	-	1	*Not in the illustration.
22	Operation Manual	-	1	*Not in the illustration.

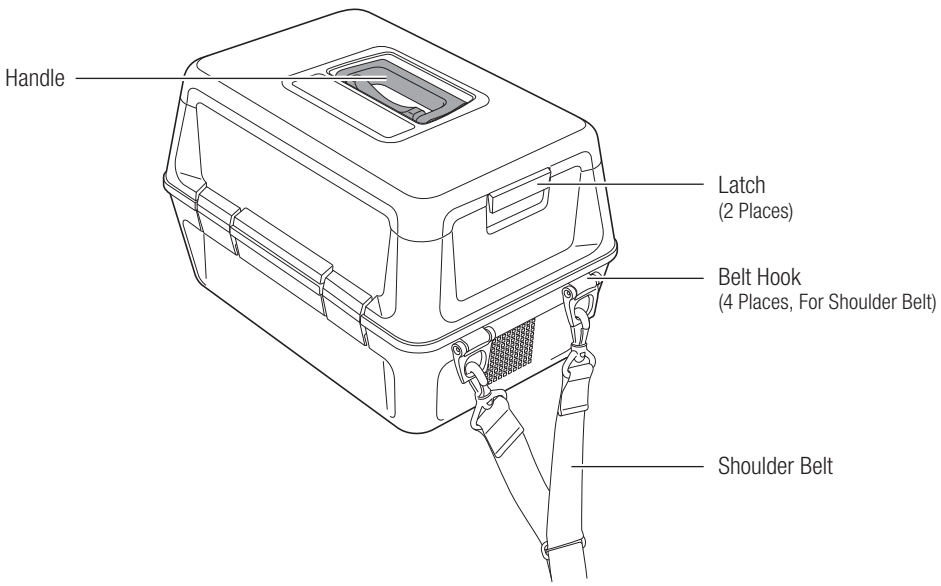
Please specify the order code listed above when ordering the spare parts. Other spare parts are listed on Page 60.
(Reference : 13-2 Spare Parts List)

4 Part Names

4-1 Control Unit



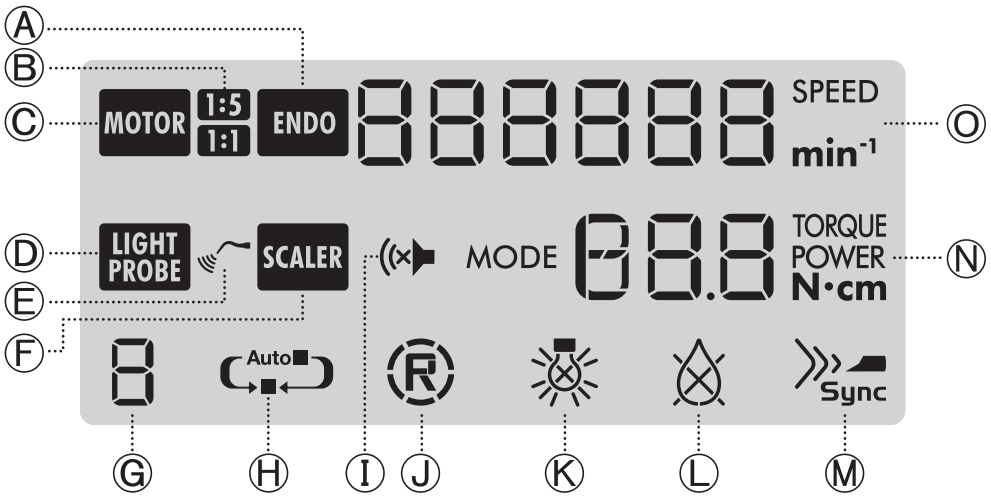

Power Switch
Fuse Holder
Foot Control Connector
(For Vacuum)
Foot Control Connector
(For Motor/Scaler)
Outlet
(For internal cooling)
*The outlet on the other
side is for Vacuum
Power Inlet


Handle
Latch
(2 Places)
Belt Hook
(4 Places, For Shoulder Belt)
Shoulder Belt

4-2 Control Panel

Keys of the Control Panel

Liquid Crystal Display of the Control Panel



*The illustration above shows all the marks.

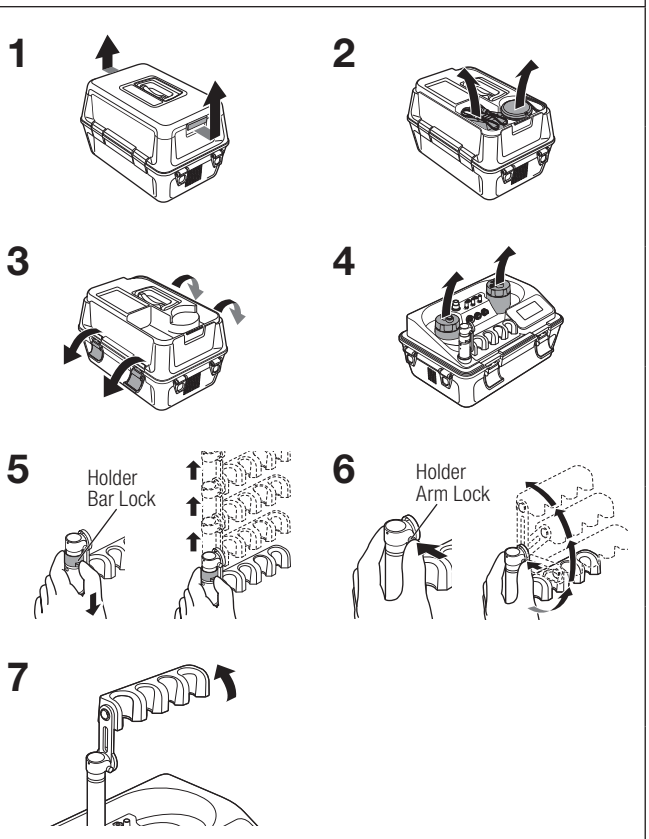
NOTICE

- A protective sheet is applied on the liquid crystal display to prevent flaws during shipping. Remove the sheet before using the product. When removing the sheet, minor change on the liquid crystal display may be noticed. It will soon get back to normal. This is not a failure.

No.	Key	Name	Display	Function	
①		MOTOR Key	ⒷⒸ	Selecting the suitable mode and the gear ratio (1:1, 1:5) for general cutting and tooth surface cleaning.	
②		ENDO Key	Ⓐ	Selecting the suitable mode for root canal treatment.	
③		LIGHT PROBE Key	Ⓓ	Selecting Light Probe Mode	
④		SCALER Key	ⒻⓃ	Selecting Ultrasonic Scaler At the same time, selecting the Treatment Mode (P, E, G) (P : PERIO Mode, E : ENDO Mode, G : GENERAL Mode)	
⑤		Motor/Scaler ON/OFF Key	ⒺⒿ	Switching ON/OFF of Motor and Scaler Operation.	
⑥		MEMORY Key	Ⓖ	It stores five setting programs (speed, torque, and auto reverse setting) during ENDO Mode. (Reference : 6-2 Motor <Endodontic treatment>)	
⑦		AUTO REV Key	Ⓗ	Setting and cancellation of auto reverse function during the ENDO Mode Auto AUTO REVERSE FORWARD Auto AUTO REVERSE Auto■ AUTO STOP (Reference : 6-2 Motor <Endodontic treatment>)	
⑧		FWD/REV Key	Ⓙ	Selecting the direction of rotation during MOTOR, ENDO Mode Ⓕ Forward Rotation (Clockwise rotation) Ⓡ Reverse Rotation (Counter Clockwise rotation)	
⑨		LIGHT Key	Ⓚ	Selecting ON/OFF of lighting during MOTOR and ENDO, Light Probe Mode	
⑩		SPRAY Key	Ⓛ	Selecting ON/OFF of Water Pouring functions during MOTOR, ENDO, and SCALER Mode.	
⑪		VACUUM Key	Ⓜ	Selecting the Vacuum suction power in three levels. Selecting Linking/Unlinking of the Vacuum with Motor and Scaler (Linking : Sync, Unlinking : No display)	
⑫		VACUUM ON/OFF Key	-	ON/OFF of the Vacuum function	
⑬		TORQUE Key	Ⓝ	During the ENDO Mode	Torque Setting (0.3 - 3.0N ·cm)
				During the SCALER Mode	Power Setting (1 - 10)
			Ⓘ	When selecting the Light Probe Mode	Sound Volume Setting (High/Low/Silent)
⑭		SPEED Key	Ⓞ	During the MOTOR Mode	Speed Setting
				During the ENDO Mode	Speed Setting
			-	When selecting the Light Probe Mode	Light Quantity Setting

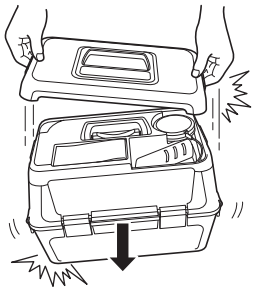
5 Preparation for Use

5-1 Preparation of Control Unit

No.	Action	Fig.
1	Open the Latch at the left and right of the Top Case Cover and take the Top Cover Case off.	
2	Take out the AC Power Cord and Foot Control (FC-76S, FC-70S).	
3	Unlock the 4 buckles on the front and back of the Control Unit and remove the Top Case from the Control Unit.	
4	Take out the Water Bottle Set and the Vacuum Bottle Set.	
5	Pull down the Holder Bar Lock and stretch the Holder Bar upward.	
6	Press the Holder Arm Lock and turn the holder forward. The position can be set at four points.	
7	Face the holder forward so that it is easy to place the handpieces.	

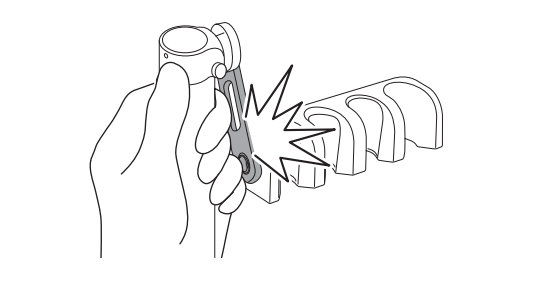
⚠ CAUTION

- Do not hold the Top Case Cover Latch when carrying the Control Unit. There is a risk that the Control Unit would fall as shown in the illustration, and cause injuries or breakage.
  The Latch is for taking off/putting on the Top Cover Case, not for carrying.

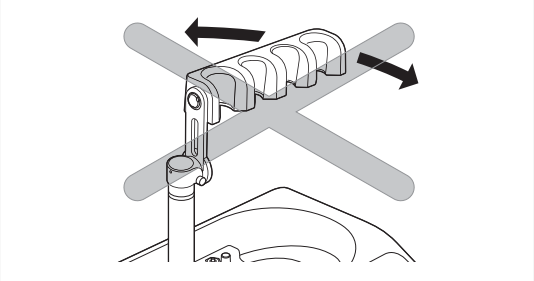


⚠ CAUTION

- Be careful not to get fingers caught when turning the holder while pressing the Holder Arm Lock. It may cause injuries.

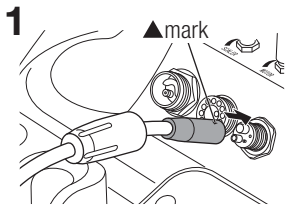
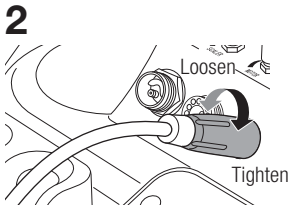
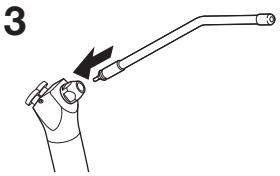
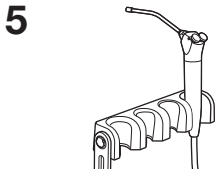


- The holder cannot be turned to the direction shown in the illustration. Turning by force could cause breakage and deformation.



- Do not put excessive load to the holder to prevent from breaking down and deformation.

5-2 Connecting the Syringe

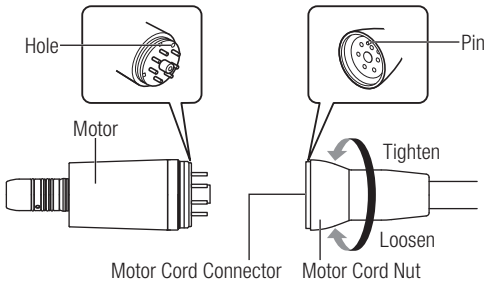
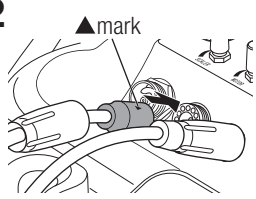
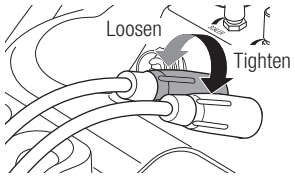
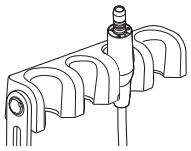
No.	Action	Fig.
1	Aligning the ▲mark of the syringe hose plug and the shape of the terminal as shown below, insert the plug deep into the syringe connector.	
2	Turn the Plug Cover for tightening.	
3	Insert the syringe nozzle firmly until a clicking sound is heard. *The syringe nozzle has already been inserted at the shipping. Move on to the next step.	
4	Pull and push the syringe nozzle to confirm it is surely connected.	
5	Place the Syringe on the Holder. *For easy handling, avoid pushing in the syringe when placing.	

⚠ CAUTION

- Be sure to tighten the plug cover firmly. If tightening is insufficient, water and air will leak and the compressor will not stop.
- If the syringe nozzle comes out easily when connecting to the syringe, stop operating and replace the O-rings.Continuous use of the syringe nozzle in the above conditions could cause the nozzle to stick out. (Reference: 10-6 Replacing the O-ring (Syringe))

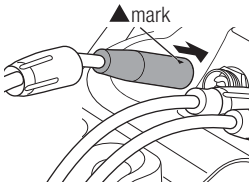
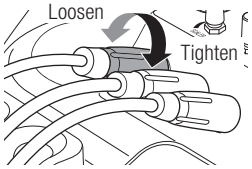
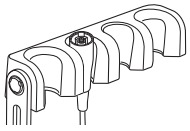
5-3 Connecting the Motor

* VIVA ace Motor Kit (Optional)

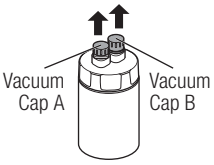
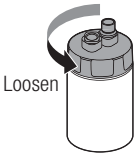
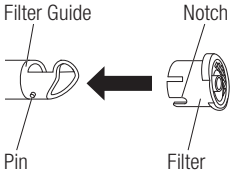
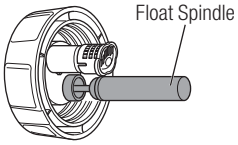
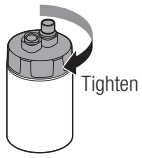
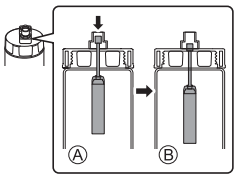
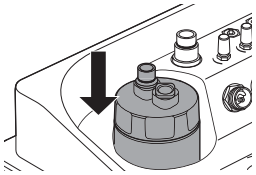
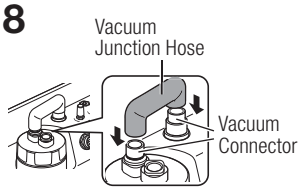
No.	Action	Fig.
1	Aligning the hole on the back of the Motor and the pin on the Motor Cord Connector, insert the pin straight into the hole and tighten the Motor Cord Nut firmly.	1 
2	Aligning the ▲mark of the Motor Cord Plug and the shape of the terminal as shown below, insert the Plug deep into the motor connector.	2 
3	Turn the Plug Cover to tighten.	3 
4	Place the Motor on the holder.	4 

5-4 Connecting the Scaler

* VIVA ace Scaler Kit (Optional)

No.	Action	Fig.
1	Aligning the ▲mark of the scaler cord and the shape of the terminal as shown below, insert the cord deep into the scaler connector.	1 
2	Turn the Plug Cover to tighten.	2 
3	Place the Scaler Cord Plug on the Holder.	3 

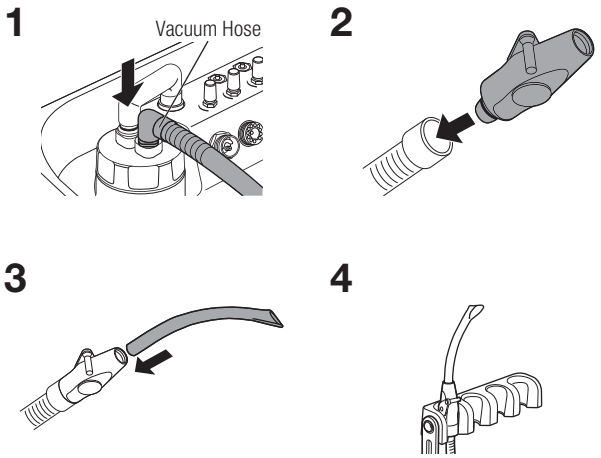
5-5 Installing the Vacuum Bottle

No.	Action	Fig.
1	Remove the Vacuum Cap A/B.	1 
2	Remove the Vacuum Bottle Lid and confirm that there is no foreign substance inside.	2 
3	Aligning the filter guide pin and the notch of the filter, insert the filter until it meets the end. *The filter has already been inserted at the shipping. Move on to the next step.	3 
4	Check that the float spindle moves smoothly and it does not stick to the lid.	4 
5	Tightly close the Vacuum Bottle lid.	5 
6	Confirm again that the float spindle is not stuck to the lid and in the state of Ⓑ. If it is in the state of Ⓐ, press the top.	6 
7	Place the Vacuum Bottle in the Control Unit.	7 
8	Insert the Vacuum Junction Hose to the Vacuum Connector firmly.	8 

⚠ CAUTION

- Do not operate the Vacuum without the filter as sucked liquid (saliva, blood, etc.) will stick to the float spindle and prevent the float spindle from moving. This may cause the sucked liquid to enter the control unit and result in abnormal smell and breakage.
- Incomplete connection may result in lowering the suction power.

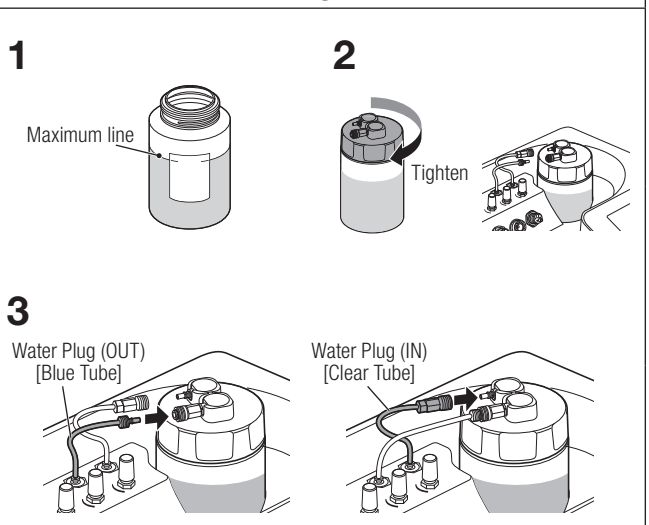
5-6 Installing the Vacuum Hose

No.	Action	Fig.
1	Remove the Hose Cap and insert the Vacuum Hose to the Vacuum Bottle Lid until it meets the end.	
2	Insert the Vacuum Valve to the Vacuum Hose until it meets the end. *The Vacuum Valve has already been inserted at the shipping.	
3	Insert the Suction Tube to the Vacuum Valve until it meets the end.	
4	Place the Vacuum on the Holder.	

⚠ CAUTION

- Incomplete connection may cause the leakage of sucked liquid (saliva, blood, etc.)

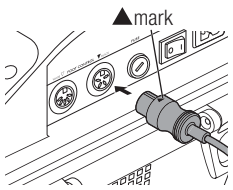
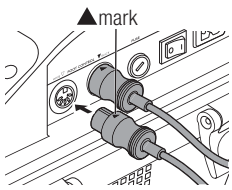
5-7 Installing the Water Bottle

No.	Action	Fig.
1	Remove the Water Bottle lid and check that there is no foreign substance inside. Fill with drinking water until it reaches below the maximum line (350 ml).	
2	Tightly close the Water Bottle lid and place the Water Bottle in the Control Unit.	
3	Insert the Water Plug (OUT) [Blue Tube] and the Water Plug (IN) [Clear Tube] to the lid until hearing a clicking sound.	

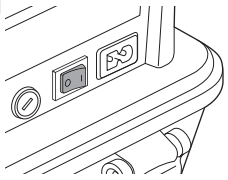
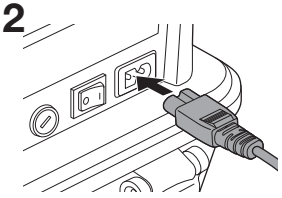
⚠ CAUTION

- Be sure to use drinking water only.
- Use of Saline, liquid medicine, high acid water may cause a failure.
- Incomplete installation may cause leakage of air and water.
- Do not place the Water Bottle anywhere other than the designated place as this may cause water leakage.
- Be sure to tighten the bottle lid firmly. If it is loose, the air will leak and the compressor will not stop.
- Do not tilt or set the bottle down with water inside. The water may be spilled.

5-8 Connecting the Foot Control

No.	Action	Fig.
1	Aligning the ▲mark as shown below, insert the FC-76S Foot Control Plug (Black) into the Connector on the right until it meets the end.	1  2 
2	Aligning the ▲mark as shown below, insert the FC-70S Foot Control Plug (White) into the Connector on the left until it meets the end.	

5-9 Connecting the AC Power Cord

No.	Action	Fig.
1	After checking that all the accessories have been connected, confirm that the Power Switch is OFF (○side).	1  2 
2	Insert the AC Power Cord into the inlet until it meets the end, and then insert it to the commercial power outlet.	

5-10 Check before treatment

Perform the following checks before using the product on a patient to confirm that there are no abnormalities. If abnormal vibration, noise, or overheating is detected, stop using the product and contact your Authorized NSK Dealer.

⚠ CAUTION

- Wait before turning on and using the VIVA ace, until it has adapted to the ambient temperature (E.g. after a cold night in the car). Note the admissible operation conditions (Reference: 12-1 Specifications).
- If the power switch is turned on without connecting the syringe to the control unit, water and air will blow out from the syringe connector. Be sure to turn on the power switch after connecting.

No.	Action
1	Check that there is no abnormal deformation or damage in the appearance.
2	Supply drinking water into the Water Bottle.
3	Confirm that all the accessories are properly connected.
4	Turn the Power Switch ON (I side), and confirm that the product is in the state of stand-by as defined below. • The compressor is activated and stops after a few seconds. • The liquid crystal display of the control panel lights and notification sound rings.
5	Start the Vacuum and confirm that it vacuums.
6	Activate the Syringe for about 5 seconds by pressing both the air button and the water button.
7	If VIVA ace Motor Kit (optional) is connected, connect the handpieces to the motor, attach the bur, and then activate the motor for about 10 seconds while applying water. Also, confirm the points below. • Check if there is any abnormal vibration, noise or overheating. • Check that the handpiece supplies water properly. • Check that the light on the motor is on.
8	If VIVA ace Scaler Kit (optional) is connected, connect the handpieces to the scaler cord plug, attach the tip, and then activate the scaler for about 10 seconds while applying water. Also, confirm the points below. • Check that the tip is vibrating properly. • Check if there is any abnormal looseness, vibration, noise, or overheating with the tip. • Check that the tip supplies water properly. • Check that the light on the handpiece is on.

6 Operation Procedure

6-1 Motor

1 Select the gear ratio

1:5
1:1

2 Set the speed

Gear Ratio	Speed (min^{-1})	Interval (min^{-1})
1:5	5,000 - 200,000	5,000
1:1	1,000 - 40,000	1,000

*When the motor is running, it displays the actual speed. When the motor is not running, it displays the maximum set speed.
*The speed can be continuously changed during operation.
(The value increases/decreases by holding down the button.)

3 Select the direction of rotation

- Forward Rotation Ⓕ
- Reverse Rotation Ⓡ

*This can be switched during operation.

5 Water ON/OFF

For Vacuum function, refer to "6-4 Vacuum"

4 Light ON/OFF

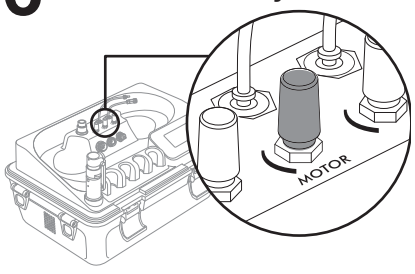
For light quantity setting, refer to "6-5 Light Probe"

7 Activate/Stop the Motor

Two ways to activate/stop the Motor are shown below:

① When using FC-76S Foot Control	② Manually Operation ON/OFF
 Step on the pedal → Activate Release the pedal → Stop *The speed can be controlled by the stepping-in pressure when using FC-76S Foot Control.	▶II Press more than 2 seconds *Long press works only for ON

6 Motor Water Adjustment



The water amount can be adjusted by turning the knob.

*This can be adjusted during operation

⚠ CAUTION

- Operating without connecting the Motor will cause the Motor Connector to blow out water and air.

6-2 Motor <Endodontic treatment>

1 Change to ENDO Mode

2 Select the program

5 programs can be stored.

3 Speed Setting

Speed (min^{-1})	Interval (min^{-1})
100 - 1,000	50
1,000 - 5,000	100

*When the motor is running, it displays the actual speed. When the motor is not running, it displays the maximum set speed.
*The speed can be continuously changed during operation. (The value increases/decreases by holding down the button.)

4 Torque Setting

Torque Setting :
0.3 - 3.0 N·cm
*Interval : 0.1 N·cm

5 Select Auto Reverse function

6 Select the direction of rotation

- Forward Rotation Ⓕ
- Reverse Rotation Ⓡ

*This can be switched during operation

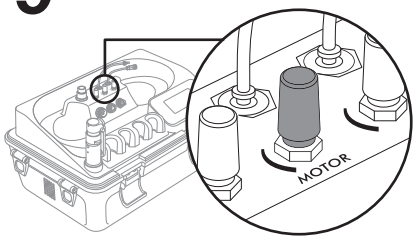
7 Light ON/OFF

For light quantity setting, refer to “6-5 Light Probe”

8 Water ON/OFF

For Vacuum function, refer to “6-4 Vacuum”

9 Motor Water Adjustment



The water amount can be adjusted by turning the knob.

*This can be adjusted during operation

10 Activate/Stop the Motor

Two ways to activate/stop the Motor are shown below:

① When using FC-76S Foot Control	② Manually Operation ON/OFF
 Step on the pedal → Activate Release the pedal → Stop *The speed can be controlled by the stepping-in amount when using FC-76S Foot Control.	 Press more than 2 seconds * Long press works only for ON

<Memory Function>

Various settings (speed, torque, and auto reverse setting) can be saved to a memory number by pressing the Memory Key. 5 programs can be stored during the ENDO Mode.

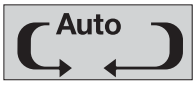
1. Press the MEMORY Key to show the number that is wished to be stored.
2. Select various setting (speed, torque, and auto reverse setting).
3. Long press the MEMORY Key for more than 1 second, the storing is finished when the notification sound rings.

NOTICE

- The Memory function does not work when the direction of rotation is set R: Reverse Rotation.

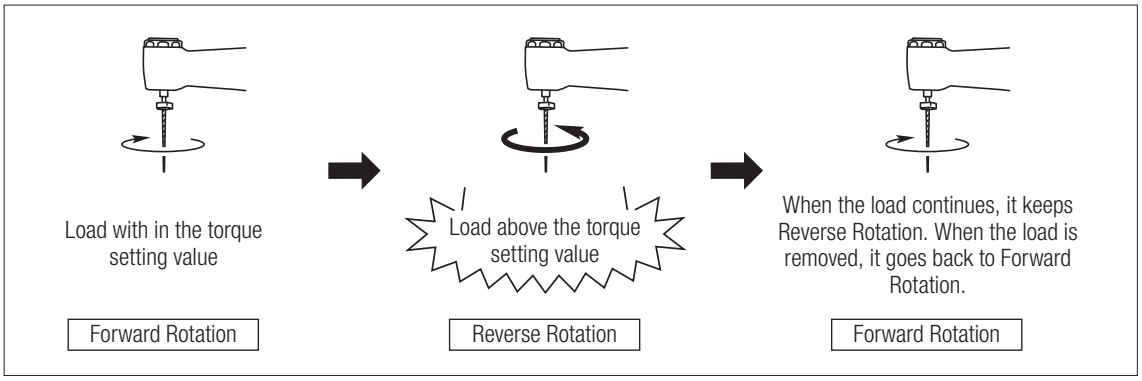
<Auto Reverse Function>

The following rotation modes can be selected when the load reaches the torque setting value during the ENDO Mode.



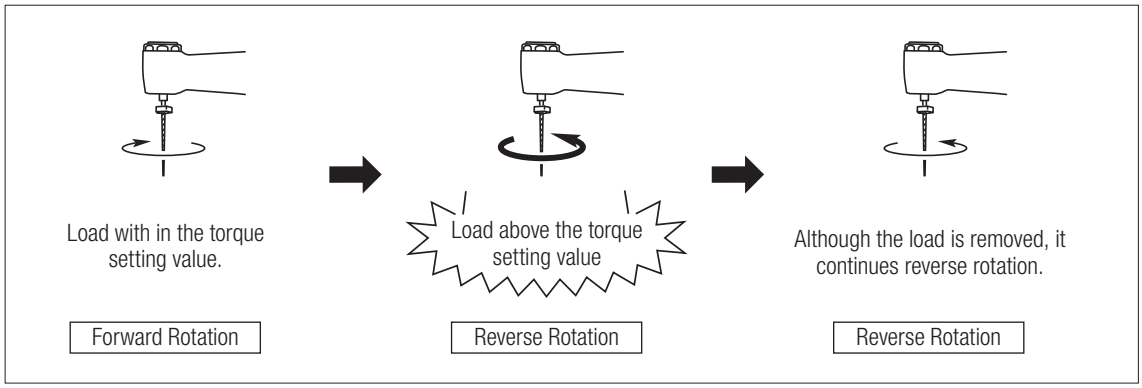
AUTO REVERSE FORWARD

Stops when the load reaches the torque setting value, starts reverse rotation, and when the load is removed, it automatically goes back to forward rotation.



AUTO REVERSE

When the load reaches the torque setting value, it stops and starts reverse rotation. When the load is removed, it continues reverse rotation.



AUTO STOP

Stops when the load reaches the torque setting value. When you wish to start the rotation (forward rotation) again, press the ON/OFF Key or step on the Foot Control.

NOTICE

- When the direction of rotation is set Reverse Rotation, Auto Reverse Function does not work.
- When the load is continuously placed on the motor, it sometimes stops automatically in the purpose of protecting from heat. When this happens, leave the motor for a while for cooling.

6-3 Ultrasonic Scaler

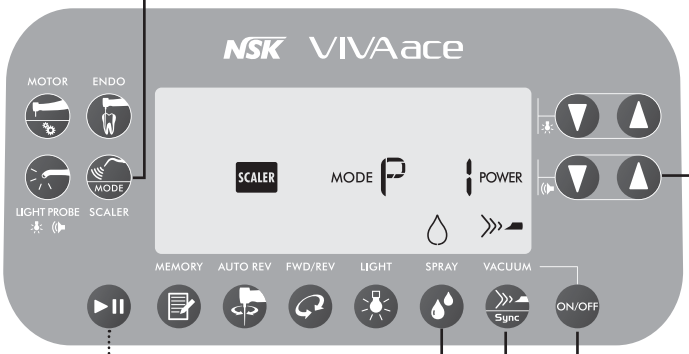
1 Select the treatment mode

P : PERIO Mode
E : ENDO Mode
G : GENERAL Mode

2 Power Setting

1 to 10

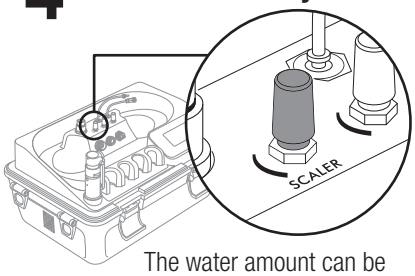
*Set it below the maximum power of the tip.
*The power can be changed during operation.
(The value continuously increases/decreases by holding down the button.)



For Vacuum function, refer to "6-4 Vacuum"

3 Water ON/OFF

4 Scaler Water Adjustments



The water amount can be adjusted by turning the knob.
*This can be adjusted during operation

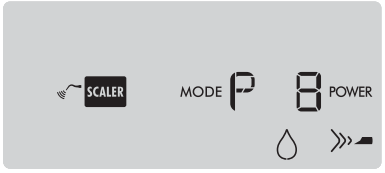
5 Activate/Stop the Scaler

Two ways to activate/stop the Scaler are shown below.

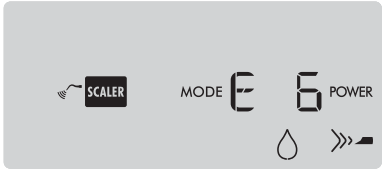
① When using FC-76S Foot Control	② Manual Operation ON/OFF
 Step on the pedal → Activate Release the pedal → Stop	Press more than 2 seconds *Long press works only for ON

<Examples>

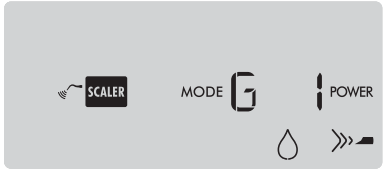
PERIO Mode : Power 8



ENDO Mode : Power 6



GENERAL Mode : Power 1



⚠ CAUTION

- Operating without connecting the Scaler to the product causes the Scaler Connector to blow out water.

6-4 Vacuum

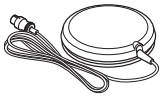
1 Select the suction force

Weak/Medium/Strong

2 Activate/Stop the Vacuum

Two ways to activate/stop the Vacuum are shown below.

① When using FC-70S Foot Control



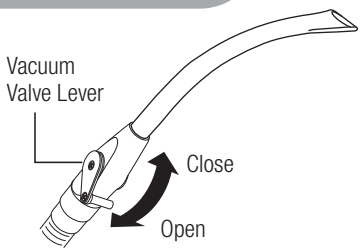
Step on the pedal → Activate
Release the pedal → Stop

② Manual Operation ON/OFF

ON/OFF

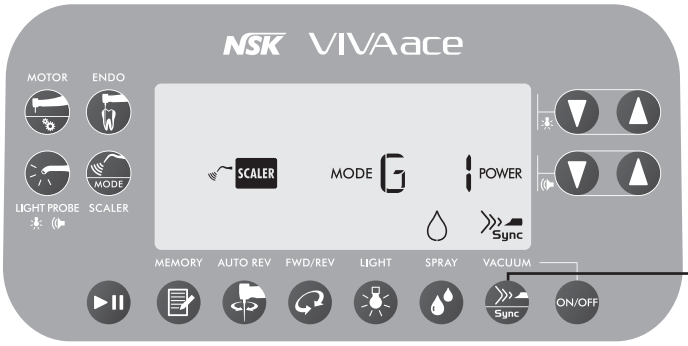
3 Vacuum ON/OFF During treatment

Suctioning stops by closing the Vacuum Valve Lever.



Sync Mode (Synchro Mode)

The Vacuum can be synchronized with the Motor and the Scaler (except during Light Probe Mode). It can be set individually at each Mode (MOTOR, ENDO, and SCALER), however the suction force value will remain the same.



Long press the VACUUM Key

(More than 1 second)

Sync	Linked
	Not Linked

When the motor and the scaler are activated, the Vacuum will be activated in conjunction.

⚠ DANGER

- Always check the Vacuum operates properly and perform suctioning accordingly. Adjust the suction force and the water amount according to the patient's condition. Refer to P58 "12-1 Specifications" for the suction force and suction amount for the Vacuum.

NOTICE

- Do not suck exceeding the maximum line (300 ml) of the Vacuum Bottle. Sucked liquid (saliva, blood, etc.) may get into the Control Unit and cause abnormal smell or malfunction. When the device is operating normally, the Float Spindle controls the suctioning to prevent over suctioning. Note that there is a risk that the float spindle may not work and over suctioning may occur in the case of abnormality. The device should be placed on the level surface. If not, there is a risk that the sucked liquid may enter the Control Unit even when the device is operating normally and the float spindle is working.
- Do not tilt or set the Vacuum Bottle down with sucked liquid inside. The liquid may be spilled.
- The Vacuum cannot be operated in other ways during the Sync Mode. The Vacuum stops a few seconds after the Motor and the Scaler stop.

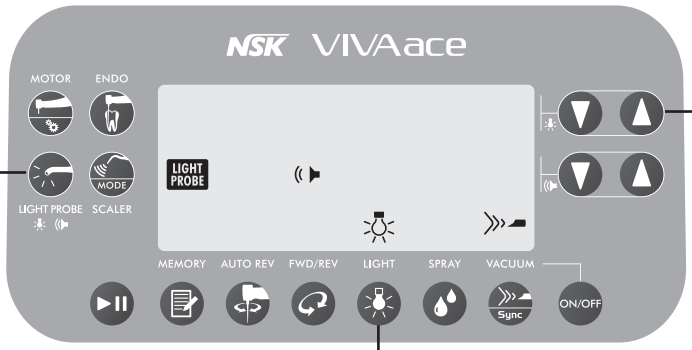
6-5 Light Probe

1 Connect the Light Probe

Connect the isoE-LUX to the Motor

2 Select the Light Probe Mode

The light is automatically turned on.



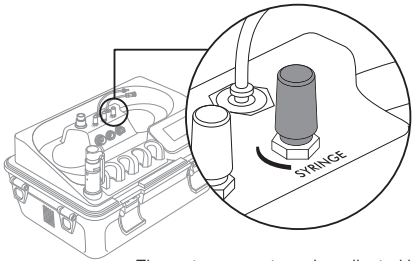
3 Light Quantity Setting

Adjustments can be made in increments and is directly reflected in the light quantity of the MOTOR Mode

4 Light ON/OFF

6-6 3way Syringe

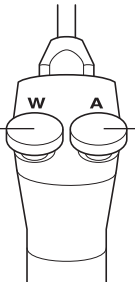
1 Syringe Water Adjustment



The water amount can be adjusted by turning the knob.
*This can be adjusted during operation

2 Syringe ON/OFF

Water Button
Water comes out when pressed



Air Button
Air comes out when pressed.

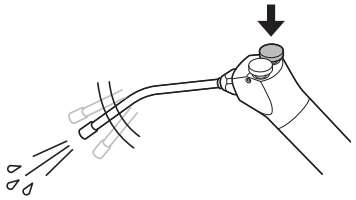
Pressing the both buttons at the same time provides spray water.

⚠ WARNING

- Pay close attention when blowing air from the syringe nozzle toward the patient's gingiva because procedural accidents such as subcutaneous emphysema could be caused. If any abnormality is detected, stop using the product and take appropriate procedures.

NOTICE

- If the Air Button is pressed while residual water is inside the Syringe Nozzle, the water will be mixed in the supplied air.
  Before you use air supply only, gently shake the Syringe while pressing the Air Button to thoroughly drain the residual water inside the Syringe Nozzle.



6-7 When the Water Bottle is empty or the Vacuum Bottle is filled with liquid during use

1 Turn off the Power Switch (○side).

2 Dispose of the sucked liquid (saliva, blood, etc.) in the Vacuum Bottle.
(Reference: 7-2-1 Cleaning (Vacuum Hose))

3 Remove the Water Bottle and fill it with water.

NOTICE

- When removing the Water Bottle, be sure to remove the Water Plug (IN) [Clear Tube] first.
- Note that if the Water Plug (OUT) [Blue Tube] is removed first, the water in the bottle will blow out for a moment. (Reference: 7-1 Preparation)
- When the Water Bottle (IN) [Clear Tube] is removed, the air in the bottle bursts out and makes a noise. This is not a failure.

6-8 Sound Volume

Sound volume of Key Operation and notification tone can be set.

1 Press the LIGHT PROBE Key

2 Sound Volume Setting

	Volume : High
	Volume : Low
	Volume : Partly OFF*

*Sound which rings around the torque setting value and during the auto reverse operation during the ENDO mode are OFF

<Types of sound>

No.	Type		Sound
1	When turning on the Power Switch		1 short beep
2	When pressing each key		1 short beep
3	When long pressing the SPEED Key and the TORQUE Key		1 short beep followed by successive short beeps while the key is being pressed
4	When storing		1 short beep followed by 1 long
5	When reaching the maximum/minimum value, When operation is not possible		3 short beeps
6	ENDO Mode	When reaching 50% of the torque setting value.	Melody 1
7		When reaching 80% of the torque setting value	Melody 2
8		When auto reversing	Melody 3
9	When an error is detected		1 long beep

NOTICE

- The sound volume setting is saved after turning off the device.

6-9 Last Memory Function

About setting of the each mode after the Main Power was turned off.
In case of each mode (MOTOR, ENDO, SCALER, LIGHT PROBE):
-The setting will be back to an initial state, when turning on the Main power.
In case of light quantity, sound volume, and the Vacuum suction force:
-The last settings are saved.

NOTICE

- Settings other than the setting of light quantity, sound volume and the Vacuum suction force, go back to default every time the device is turned on.

6-10 Initialization Program (Factory Setting)

The setting can be restored to the Factory Settings.

1 Turn off the Power Switch.

2 Turn on the Power Switch while pressing the MEMORY Key.
When a beep sound rings, initialization is finished.

<Factory Settings>

Mode	Speed (min^{-1})	Torque (N·cm)	Power / Mode	Water	Light ON/OFF	Direction of Rotation	Auto Reverse Mode	Vacuum suction force	Sound Volume
MOTOR	1,000 (Gear Ratio 1 : 1)	-	-	OFF	ON	(F) F : Forward rotation	-	Strong	High
ENDO	100 *All memories together	0.3 *All memories together	-	OFF	ON	(F) F : Forward rotation	Auto AUTO REVERSE FORWARD		
SCALER	-	-	Power : 1 / Mode : P	ON	-	-	-		
LIGHT PROBE	-	-	-	-	ON	-	-		

NOTICE

- Take note of present settings before initialization if needed.
- The setting of light quantity before initialization is kept.

6-11 Protection Circuit

The protection circuit will be activated and stop the device to prevent from danger and breakage when the device is operated with the load exceeding its maximum value. The error code will be displayed in the display panel. (Reference:11-1 Error Code)

<Motor>

The Motor will stop automatically due to failure, excessive load, disconnection and incorrect usage of the device. Protection function will work and control the torque automatically to prevent the overheating of Motor Coil caused by excessive load.
TORQUE flickers on the occasion.
When the protection function is released, the torque will automatically recover. During the MOTOR Mode, **TORQUE** turns off, and during the ENDO Mode, **TORQUE** stops flickering.

<Scaler>

When using exceeding the power 7 of the G Mode, and the inside being heated by long-time use, protection function will be activated and lower the power automatically.
POWER flickers on the occasion.
When protection function is released, flickering will be turned off. However, the power will not automatically go up over 8 for safety reasons. Increase the power manually when needed.

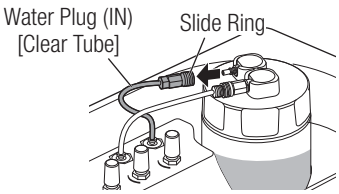
NOTICE

- <Scaler>
  While the protection function is working, (**POWER** flickering) it is not possible to higher the power over 7.

7 Post-use Maintenance

After each patient maintain the product as follows.

7-1 Preparation

No.	Action	Fig.
1	Wear eye protection, a mask, and gloves to prevent infection.	3 
2	Turn off the Power Switch of the Control Unit.	
3	First, remove the Water Plug (IN) [Clear Tube] while pulling the Slide Ring.	
4	Remove the Water Plug (OUT) [Blue Tube] pressing the Slide Ring.	
5	Dispose of the water in the Water Bottle and set the empty bottle again in the Control Unit.	
6	Turn on the Power Switch of the Control Unit.	
7	Maximize each Water Adjuster, activate the Motor, Scaler and the Syringe to let out the water remaining in the hose.	
8	Activate the Vacuum. Hold the Vacuum Hose above the bottle to let the sucked liquid flow into the bottle.	

⚠ CAUTION

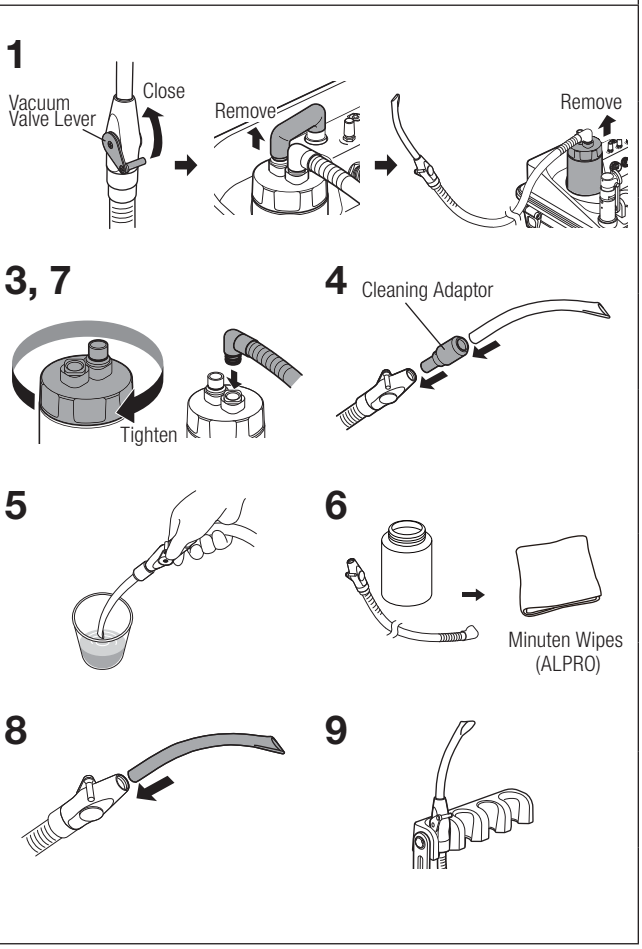
- Do not clean, immerse, or wipe with electrolyzed-oxidizing water (strong acidic water, super acidic water), strong acidic and strong alkaline liquid medicine, solvent containing chlorine, benzene, or thinner.
- Do not wash the product with a thermo-disinfector. It may result in failure.
- Maintain the vacuum hose, bottles, and other accessories properly. Store and keep the product dried. Insufficient maintenance and drying could cause abnormal smell and rust.
- Be sure to check if there is residual water inside the product (bottles, cords and hoses). If water remains, it may freeze and cause breakage.
- For details of the cleaning, disinfectant, etc. used for the "VIVAace", confirm the the operation manuals issued by manufacturer.
- Do not use a cleaning and disinfection solution etc. not mentioned in this operation manual.
- Follow any additional local directives, standards, and guidelines for cleaning, disinfection, and sterilization.
- Option parts (Motor and Ultrasonic Scaler) should be maintained in accordance with the attached operation manuals.

NOTICE

- Be sure to remove the Water Plug (IN) [Clear Tube] first.
- Note that if the Water Plug (OUT) [Blue Tube] is removed first, the water in the bottle may blow out for a moment.
- When the Water Plug (IN) [Clear Tube] is removed, the air in the bottle bursts out and makes a noise. However, this is not a failure.

7-2 Maintenance for between each patient

7-2-1 Cleaning (Vacuum Hose)

No.	Action	Fig.
1	Remove the Vacuum Bottle from the Control Unit with the Vacuum Hose attached.	
2	Remove the Vacuum Hose and the Vacuum Bottle Lid, then dispose of the sucked liquid (saliva, blood, etc.) in the bottle.	
3	Attach the Vacuum Bottle Lid and the Vacuum Hose to the Vacuum Bottle and place it in the Control Unit.	
4	Remove the Suction Tube, connect the Cleaning Adaptor to the Vacuum Valve, and then connect the Suction Tube again.	
5	Suck the drinking water (amount of about 200mL) to clean the hose. Dispose of the sucked water in the Vacuum bottle (Repeat procedure No.1 to 2.).	
6	Wipe the surface of the Vacuum Hose, Vacuum Bottle, Cleaning Adaptor and the Holder with the disinfectant wipes (Minuten Wipes: ALPRO).	
7	Tightly close the Vacuum Bottle Lit and attach the Vacuum Hose to the Vacuum Bottle. Then place the Vacuum Bottle in the Control Unit.	
8	Attach the sterilized Suction Tube to the Vacuum Valve.	
9	Place the Vacuum on the Holder.	

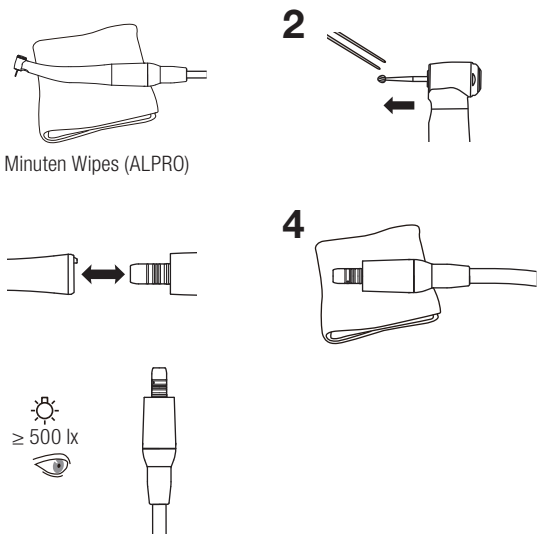
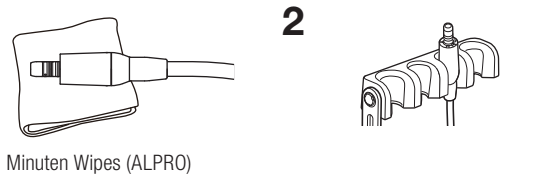
⚠ CAUTION

- Change to a sterilized Suction Tube after each patient (Suction Tube can be sterilized).

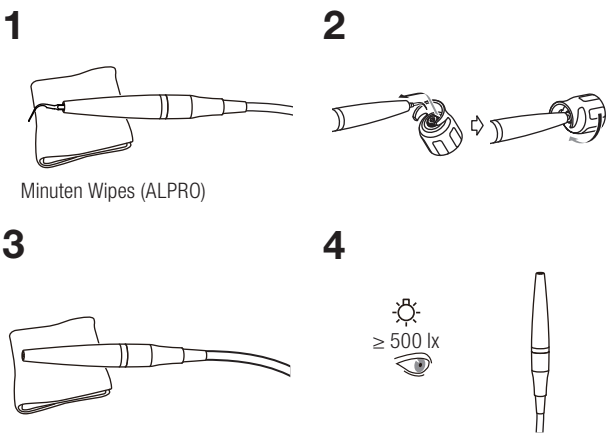
NOTICE

- If the Vacuum Valve Lever is not closed, there is a danger that the sucked liquid remaining in the Vacuum Hose might run out.
- The removal of the Vacuum Hose from the Vacuum Bottle should be done in the cleaning tank because there might be sucked liquid (saliva, blood, etc.) remaining in the Vacuum Hose.

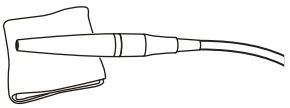
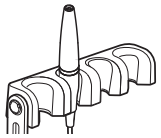
7-2-2 Cleaning and Disinfection of the outside of the Motor and the Motor Cord, and Replacing the Motor

No.	Action	Fig.
<Cleaning>		
1	Remove the all debris on the surface of the Handipiece, Motor and the Motor Cord with a wipes (Minuten Wipes: ALPRO).	
2	Remove the bur from the Handpiece with tweezers. * Maintenance of the bur should be done in accordance with the operation manual issued by the manufacturer.	
3	Remove the Handpiece from the Motor. * Maintenance of the Handpiece should be done in accordance with its operation manual.	
4	Wipe the debris on the surface of the Motor and the Motor Cord using a cloth moistened with water.	
5	Under appropriate lighting (500 lx or higher), inspect the Motor and the Motor cord for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No.4.	
<Disinfection>		
1	Wipe the surface of the Motor, the Motor Cord and the Holder with the disinfectant wipes (Minuten Wipes: ALPRO).	
2	Disconnect the Motor from the Motor Cord, then attach a sterilized Motor and place it on the Holder. * Be sure to sterilize a used Motor. Reference: "7-4 Sterilization".	

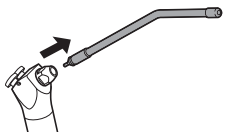
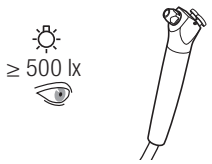
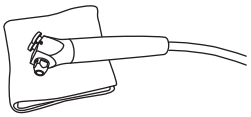
7-2-3 Cleaning and Disinfection of outside of the Scaler Handpiece and the Scaler Cord, and Replacing the Scaler Handpiece

No.	Action	Fig.
<Cleaning>		
1	Remove the all debris on the surface of the Scaler Handpiece and the Scaler Cord using the wipes (Minuten Wipes: ALPRO).	
2	Remove the Tip from the Scaler Handpiece * Reference: "4-3 Mounting the Tip" of the Scaler Kit Operation Manual.	
3	Wipe the debris on the surface of the Scaler Handpice and the Scaler Cord with a cloth moistened with water.	
4	Under appropriate lighting (500 lx or higher), inspect the Scaler Handpiece and the Scaler Cord for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No.3.	

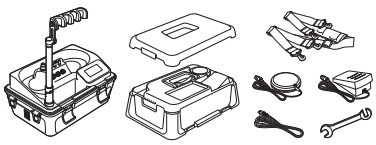
7-2-3 Cleaning and Disinfection of outside of the Scaler Handpiece and the Scaler Cord, and Replacing the Scaler Handpiece (continued)

No.	Action	Fig.
<Disinfection>		
1	Wipe the surface of the Scaler Handpiece and the Scaler Cord with the disinfectant wipes (Minuten Wipes: ALPRO).	1  Minuten Wipes (ALPRO)
2	Disconnect the Scaler Handpiece from the Scaler Cord, then attach a sterilized Scaler Handpiece and place it on the Holder. * Be sure to clean, disinfect and sterilize a used Scaler Handpiece and the Tip. Reference: Scaler Kit Operation Manual.	2 

7-2-4 Cleaning (Syringe) and Replacing of the Syringe Nozzle

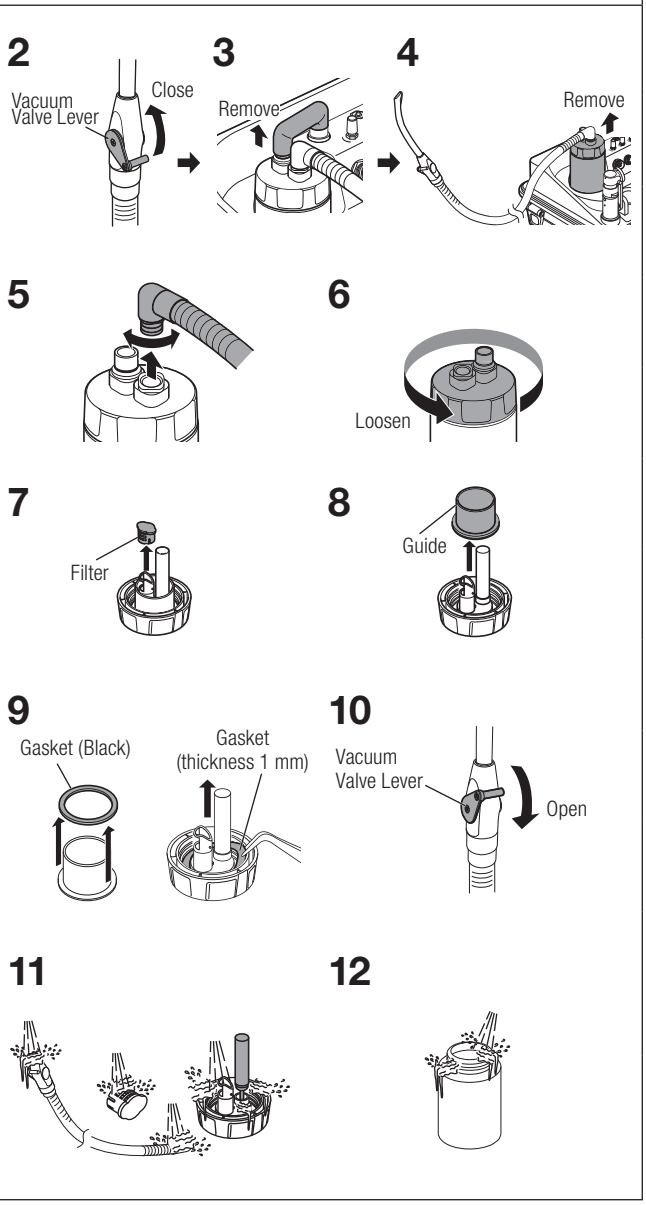
No.	Action	Fig.
<Cleaning>		
1	Remove the Syringe Nozzle from the Syringe Body. Syringe Body: Proceed to the procedure No.2 Syringe Nozzle: Proceed to the "7-3-9 Cleaning and Disinfection (Syringe, Syringe Nozzle)".	1 
2	Remove the debris on the surface of the Syringe Body with a plastic brush (do not use the wire brush.).	
3	Wipe the Syringe Body with a cloth moistened with water.	
4	After cleaning, under appropriate lighting (500 lx or higher), inspect the Syringe Body for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 2.	4 
<Disinfection>		
1	Wipe the surface of the Syringe Body with the disinfectant wipes (Minuten Wipes: ALPRO).	1  Minuten Wipes (ALPRO)
2	Attach a sterilized Syringe Nozzle to the Syringe Body and place it on the Holder. * Be sure to sterilize a used Syringe Nozzle, refer to section "7-4 Sterilization".	

7-2-5 Cleaning (Control Unit etc.)

Action	Fig.
Objects: Control Unit, Top Case, Top Cover Case, Shoulder Belt, Spanner.	
Turn off the power switch of the Control Unit and take out all the accessories. After wiping the water with wrung out cloth, wipe with the disinfectant wipes (Minuten Wipes: ALPRO).	

7-3 Maintenance After Close

7-3-1 Cleaning (Vacuum Hose, Vacuum Bottle)

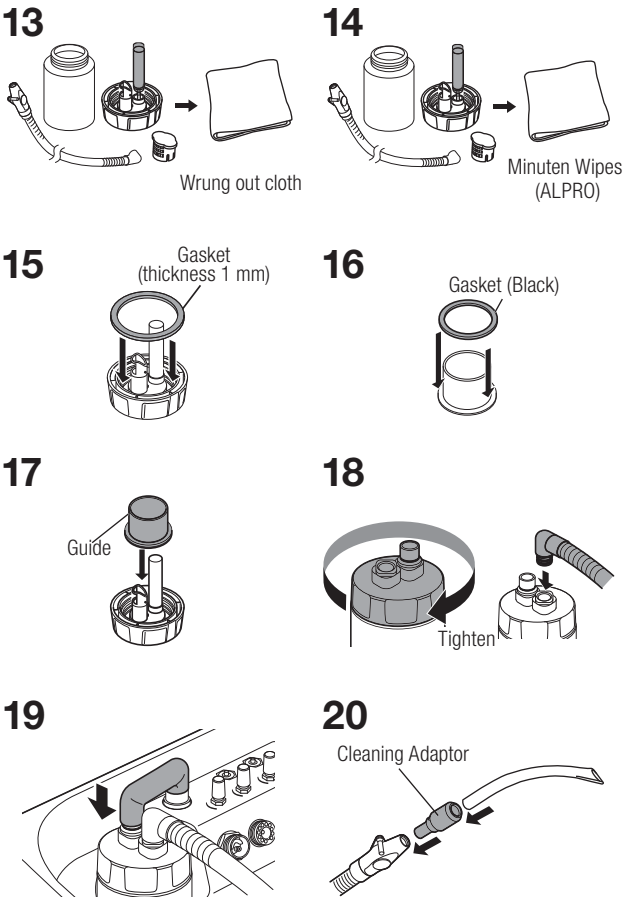
No.	Action	Fig.
1	Turn off the Power Switch of the Control Unit.	
2	Close the Vacuum Valve Lever.	
3	Remove the Vacuum Junction Hose at the Vacuum Bottle side only.	
4	Remove the Vacuum Bottle from the Control Unit with the Vacuum Hose attached.	
5	Remove the Vacuum Hose by twisting and pulling up the hose.	
6	Remove the Vacuum Bottle lid and dispose of the sucked liquid (saliva, blood, etc.) in the bottle.	
7	Remove the filter from the lid.	
8	Remove the guide from the lid.	
9	Remove the Gasket (Black) and the Gasket with tweezers.	
10	Open the Vacuum Valve Lever.	
11	Clean the solid matter attached to the Filter, the Float Spindle, and the Vacuum Hose with running water. * For the remaining dirt, use a brush (Do not use a wire brush) to remove the dirt.	
12	Clean the outside and the inside of the Vacuum Bottle with running water. * For the remaining dirt, use a brush (Do not use a wire brush.) to remove the dirt.	

NOTICE

- If the Vacuum Valve Lever is not closed, there is a risk of the sucked liquid remaining in the vacuum hose might flow backward.
- The removal of the Vacuum Hose should be done in the cleaning tank because there might be sucked liquid (saliva, blood, etc.) remaining in the Vacuum Hose.

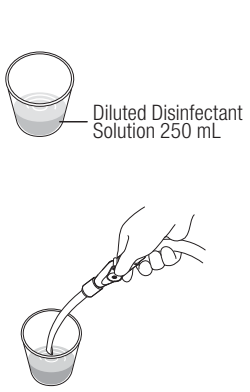
7-3-1 Cleaning (Vacuum Hose, Vacuum Bottle) (Continued)

No.	Action	Fig.
13	Wipe the water on the outside of each part with a wrung out cloth.	
14	Wipe with the disinfectant wipes (Minuten Wipes: ALPRO).	
15	Attach the Gasket to the Vacuum Bottle Lid.	
16	Attach the Gasket (Black) to the Vacuum Bottle Lid.	
17	Attach the Guide to the Lid. Do not attach the Filter at this time.	
18	Put the Lid back on to the bottle and connect the Vacuum Hose to the Lid.	
19	Set the Vacuum Bottle in the Control Unit and connect the Vacuum Junction Hose.	
20	Remove the Suction Tube, connect the Cleaning Adaptor to the Vacuum Valve, and then connect the Suction Tube again.	

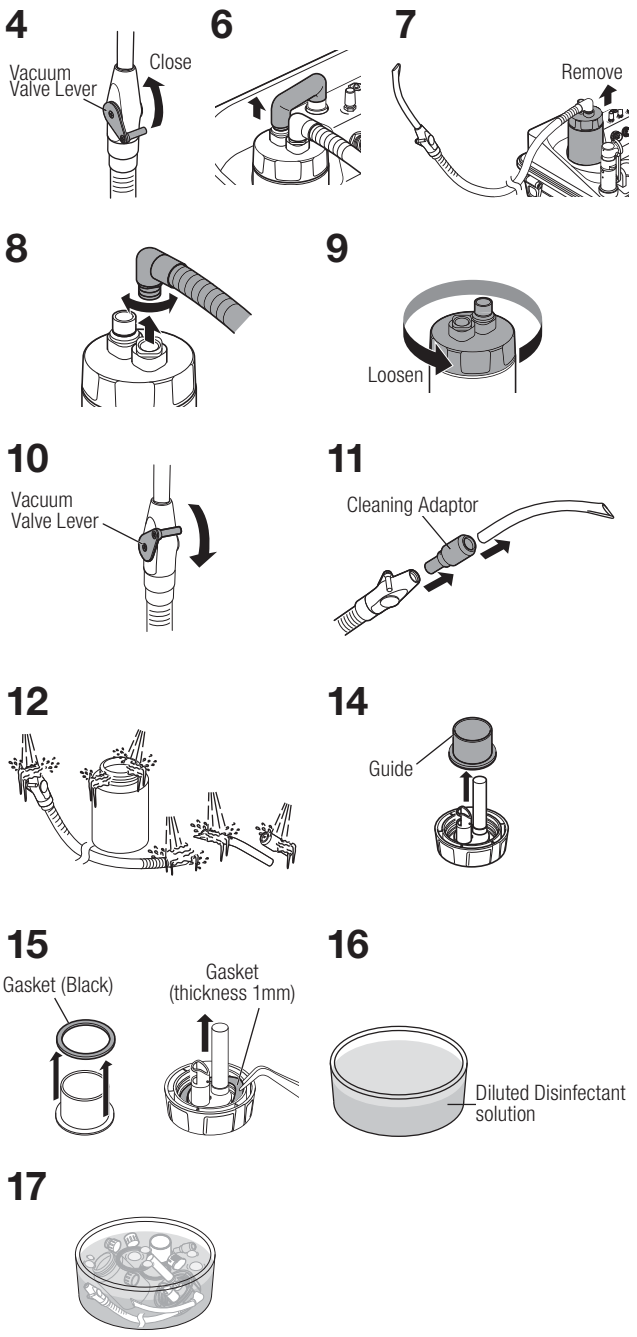


7-3-2 Disinfection (Vacuum Hose, Vacuum Bottle)

No.	Action	Fig.
1	Prepare a container of 500 mL capacity, and make 250 mL Disinfectant solution. * For details, confirm the operation manual isseued by manufacturer. Disinfectant solution: AlproJet-DD (5 mL): ALPRO Dilution Ratio: 2%	
2	Turn on the Power Switch of the Control Unit.	
3	Activate the vacuum, suck the disinfection solution until the container is empty. * Vacuuming will stop automatically when the sucking amount exceeds the maximum amount.	



No.	Action	Fig.
4	Close the Vacuum Valve Lever.	
5	Stop VACUUM and then turn off the Power Switch of the Control Unit.	
6	Remove the Vacuum Junction Hose from the Vacuum Bottle side only.	
7	Remove the Vacuum Bottle from the Control Unit with the Vacuum Hose attached.	
8	Remove the Vacuum Hose by twisting and pulling up the Vacuum Hose.	
9	Remove the Vacuum Bottle Lid and dispose the sucked disinfectant solution of the inside of the bottle.	
10	Open the Vacuum Valve Lever.	
11	Remove the Suction Tube and the Cleaning Adaptor.	
12	Clean the Vacuum Hose, Vacuum Bottle, Suction Tube, Vacuum Valve, and the Cleaning Adaptor under running water.	
13	Wipe the water on the surface of the Vacuum Hose, Vacuum Bottle, Suction Tube, Vacuum Valve and the Cleaning Adaptor with a wrung out cloth.	
14	Remove the Guide from the Lid.	
15	Remove the Gasket (Black) and the Gasket with tweezers.	
16	Prepare an empty container and make the Disinfectant Solution. *For details, confirm the operation manual issued by manufacturer. Disinfectant solution: AlproJet-DD (ALPRO) Dilution Ratio: 2%	
17	Soak the Guide, Lid, Gasket (black), Gasket (Thickness 1mm), Filter, Vacuum Cap A/B, Hose Cap, Vacuum Bottle, Vacuum Hose, Suction Tube and Cleaning Adaptor in the Disinfectant Solution for a night.	



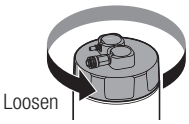
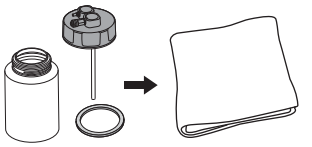
⚠ CAUTION

- Do not attach the Filter to the Vacuum Bottle Lid, when disinfecting the Vacuum Hose and the Vacuum Bottle with the Alpro Jet-DD (ALPRO).

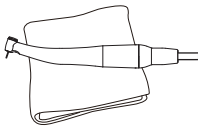
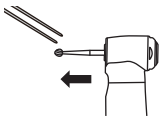
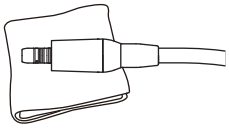
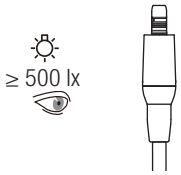
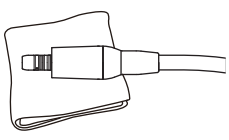
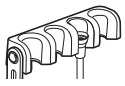
NOTICE

- If the Vacuum Valve Lever is not closed, there is a danger that the disinfectant solution remaining in the Vacuum hose might flow backward.

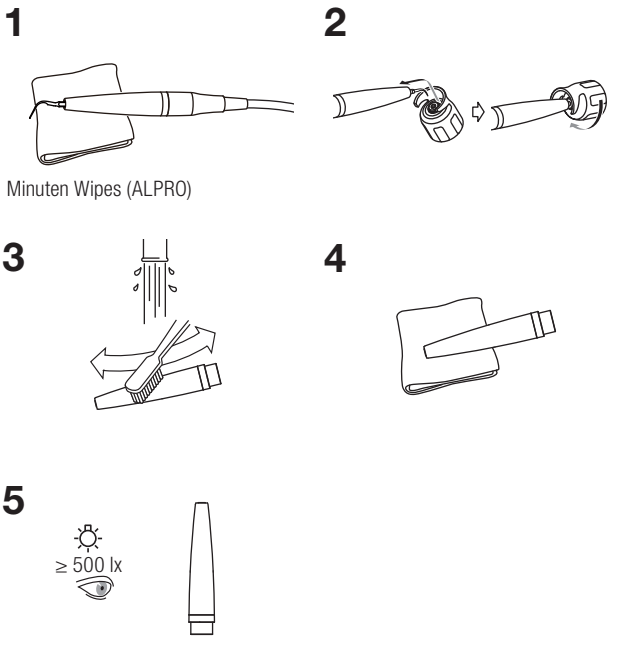
7-3-3 Cleaning (Water Bottle)

No.	Action	Fig.
1	Remove the Water Bottle Lid.	1 
2	Clean the inside and the outside of the Water Bottle and the Lid under running water. * For the remaining dirt, use a soft bristled brush to remove the dirt. * Make sure that no dirt is remaining after cleaning. When there is remaining dirt, repeat the cleaning procedure until dirt is completely cleaned away.	
3	After wiping with a dry cloth, wipe with the disinfectant wipes (Minuten Wipes: ALPRO) and set up the bottle.	3 

7-3-4 Cleaning and Disinfection of the outside of the Motor and the Motor Cord

No.	Action	Fig.
<Cleaning>		
1	Remove the all debris on the surface of the Handipiece, Motor and the Motor Cord with a wipes (Minuten Wipes: ALPRO).	1  2 
2	Remove the bur from the Handpiece with tweezers. * Maintenance of the bur should be done in accordance with the operation manual issued by the manufacturer.	
3	Remove the Handpiece from the Motor. * Maintenance of the Handpiece should be done in accordance with its operation manual.	3  4 
4	Wipe the debris on the surface of the Motor and the Motor Cord with a cloth moistened with water.	
5	Under appropriate lighting (500 lx or higher), inspect the Motor and the Motor cord for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No.4.	5 
<Disinfection>		
1	Wipe the surface of the Motor, the Motor Cord and the Holder with disinfectant wipes (Minuten Wipes: ALPRO).	1  2 
2	Disconnect the Motor from the Motor Cord. Motor Cord: Place the Holder. Motor: Proceed to section "7-4 Sterilization" .	

7-3-5 Cleaning of the outside of the Scaler Handpiece

No.	Action	Fig.
<Cleaning>		
1	Remove the all debris on the surface of the Scaler Handpiece and the Scaler Cord with the wipes (Minuten Wipes: ALPRO).	
2	Remove the Tip from the Scaler Handpiece. Remove the Scaler Handpiece from the Scaler Cord. * Reference "4-3 Mounting the Tip" of the Scaler Kit Operation Manual. * Maintenance of the Tip and the Tip Wrench, refer to the Scaler Kit Operation Manual.	
3	Clean the surface of the Scaler Handpiece under running water with a soft bristled brush for more than 20 seconds. Water temperature: 38C° or less Water quality: Water available as drinking water Water amount: 3.5L/min or more	
4	Wipe the residual moisture on the surface of the Scaler Handpiece with a dry cloth.	
5	After cleaning, under appropriate lighting (500 lx or higher), inspect the Scaler Handpiece for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 3.	

7-3-6 Cleaning and Disinfection of the inside of the Scaler Handpiece (Including the Water Line)

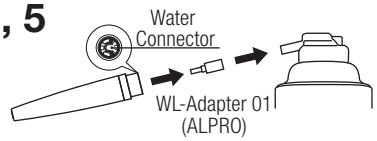
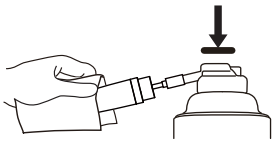
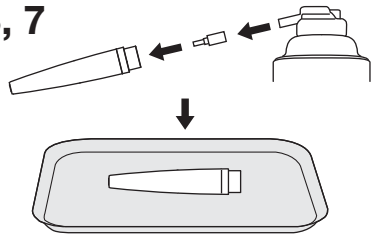
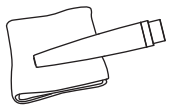
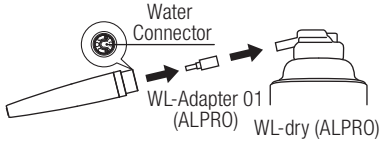
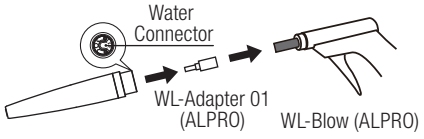
⚠ CAUTION

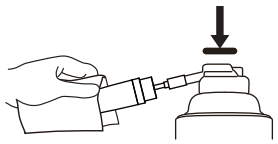
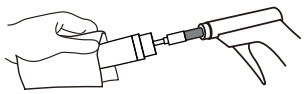
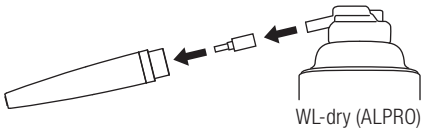
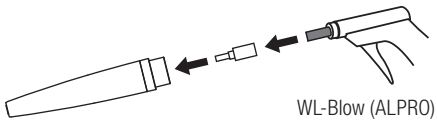
- Be sure to perform Cleaning and Disinfection the "7-3-5 Cleaning of the outside of the Scaler Handpiece" before "7-3-6 Cleaning and Disinfection of the inside of the Scaler Handpiece (Including the Water Line)"
- After disinfection, be sure to sterilize the Scaler Handpiece. Reference: "7-4 Sterilization".
- When using the each Spray (ALPRO), be sure to cover the tip of the Scaler Handpiece with a cloth, etc. to prevent the dispersal of the cleaning solution and the disinfecting solution in the surrounding area. It is recommended to use a Spray Mist Absorber (Y900084).

7-3-6-1 Manual Cleaning and Disinfection (Including the Water line) (In case of connecting to the adapter)

WL-Adapter 01 (ALPRO) is to be prepared by customers.

Cleaning and Disinfection should be done in the cleaning tank.

No.	Action	Fig.
1	Attach the WL-Adapter 01 (ALPRO) to the WL-clean (ALPRO) and contact the Water Connector on the Scaler Handpiece to the end of the WL-Adapter 01 (ALPRO).	1, 5 
2	Spray the WL-clean (ALPRO) to the Water Connector on the Scaler Handpiece with hold the Scaler Handpiece and the WL-clean (ALPRO), clean the inside of Water Line. For details, confirm the operation manuals issued by manufacturer. Spray time: 2 seconds Number of spray: 3 times	2, 6 
3	Release the Water Connector on the Scaler Handpiece from the WL-Adapter 01 (ALPRO) and remove the WL-Adapter 01 (ALPRO) from the WL-clean (ALPRO). Place the Scaler Handpiece onto the tray for at least 1 minute to take effect.	3, 7 
4	Wipe the surface of the Scaler Handpiece with the disinfectant wipes (Minuten Wipes: ALPRO).	4  Minuten Wipes (ALPRO)
5	Attach the WL-Adapter 01 (ALPRO) to the WL-cid (ALPRO) and contact the Water Connector on the Scaler Handpiece to the end of the WL-Adapter 01 (ALPRO).	
6	Spray the WL-cid (ALPRO) to the Water Connector on the Scaler Handpiece with hold the Scaler Handpiece and the WL-cid (ALPRO), disinfect the inside of Water Line. For details, confirm the operation manuals issued by manufacturer. Spray time: 3 seconds Number of spray: 1 time	
7	Release the Water Connector on the Scaler Handpiece from the WL-Adapter 01 (ALPRO) and remove the WL-Adapter 01 (ALPRO) from the WL-cid (ALPRO). Place the Scaler Handpiece onto the tray for at least 2 minutes to take effect.	
8	Attach the WL-Adapter 01 (ALPRO) to the WL-dry (ALPRO) or the WL-Blow (ALPRO) and contact the Water Connector on the end of the Scaler Handpiece to the end of the WL-Adapter 01 (ALPRO).	8 · When using the WL-dry (ALPRO):  · When using the WL-Blow (ALPRO): 

No.	Action	Fig.
9	Discharge the disinfectant solution from the Water Line on the Scaler Handpiece. For details, confirm the operation manuals issued by manufacturer. · When using the WL-dry (ALPRO): Spray time: 3 seconds Number of spray: 1 time · When using the WL-Blow (ALPRO): Air blow time: 3 seconds Number of blast: 1 time	9 · When using the WL-dry (ALPRO):  WL-dry (ALPRO) · When using the WL-Blow (ALPRO):  WL-Blow (ALPRO)
10	Release the Water Connector on the Scaler Handpiee from the WL-Adapter 01 (ALPRO) and remove the WL-Adapter 01 (ALPRO) from the WL-dry (ALPRO) or the WL-Blow (ALPRO).	10 · When using the WL-dry (ALPRO):  WL-dry (ALPRO) · When using the WL-Blow (ALPRO):  WL-Blow (ALPRO)
11	Proceed to section "7-3-7 Cleaning of the Glass Rod" and "7-4 Sterilization".	

⚠ CAUTION

- Be sure to discharge the remained solution from the inside of the Scaler Handpiece with the WL-dry (ALPRO) or the WL-Blow (ALPRO), after cleaning and disinfection with the WL-clean (ALPRO) and the WL-cid (ALPRO).
- After cleaning and disinfection of the Scaler Handpiece, be sure to clean the Glass Rod and sterilize the Scaler Handpiece. Reference: "7-3-7 Cleaning of the Glass Rod" and "7-4 Sterilization".

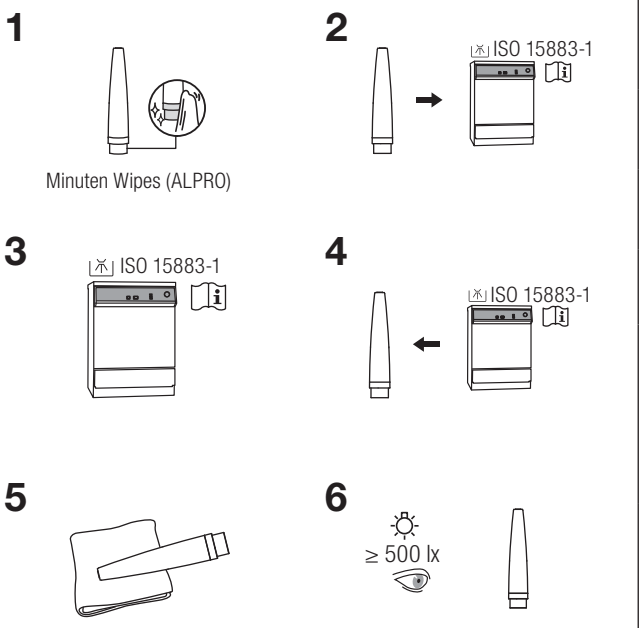
7-3-6-2 Automated Cleaning and Disinfection (Including the Water line)

⚠ CAUTION

- Scaler Cord cannot be cleaned with washer-disinfector.
- Use a cleaning and disinfection device (washer-disinfector) complying with DIN EN ISO 15883 (e.g. Miele washer-disinfector G7781/G7881; Melag Melatherm), that operates with a maximum pH value of 10.5 (e.g. neodisher, Dr. Weigert) and is equipped with the appropriate adapters. Proof of suitability for the process must be obtained from the washer-disinfector manufacturer.
- Automated cleaning and disinfection should be done in accordance with the operation manual of washer-disinfector.
- After using washer-disinfector, dry the product completely. The remaining moisture causes internal corrosion etc.

Adapter (ADS 2: Miele/73900: Melag) is to be prepared customers.

No.	Action	Fig.
1	Wipe the contact part of the Scaler Handpiece and adapter (ADS 2: Miele/ 73900: Melag) with the disinfectant wipes (Minuten Wipes: ALPRO).	
2	Attach the Scaler Handpiece to the Adapter (ADS 2: Miele/ 73900: Melag) of the washer-disinfector.	
3	Clean and disinfect the Scaler Handpiece.	
4	Remove the Scaler Handpiece from the Adapter (ADS 2: Miele/73900: Melag) of the washer-disinfector.	
5	After cleaning and disinfection, wipe the residual moisture of the Scaler Handpiece with a dry cloth. Or the blow it off with filtered clean compressed air (≤0.35MPa) until there is no moisture in the interior and exterior.	
6	Under appropriate lighting (500 lx or higher), inspect the Scaler Handpiece for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 2.	
7	Proceed to the section "7-3-7 Cleaning of the Glass and "7-4 Sterilization".	



⚠ CAUTION

- Scaler Handpiece must be removed from the washer-disinfector immediately (within 1 hour) after the cleaning, disinfecting and drying cycle is complete to prevent corrosion.
- After using washer-disinfector, dry the product completely. The remaining moisture causes internal corrosion etc.
- After cleaning and disinfection of the Scaler Handpiece, be sure to clean the Glass Rod and sterilize the Scaler Handpiece. Reference: "7-3-7 Cleaning of the Glass Rod" and "7-4 Sterilization".

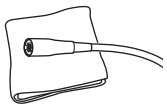
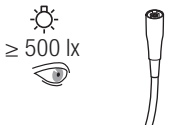
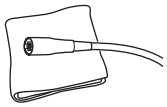
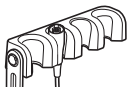
7-3-7 Cleaning of the Glass Rod

Action	Fig.
When contaminants or cutting dust is attached to the end of the Glass Rod, wipe carefully with the disinfectant wipes (Minuten Wipes: ALPRO). Proceed to section "7-4 Sterilization".	 Minuten Wipes (ALPRO)

⚠ CAUTION

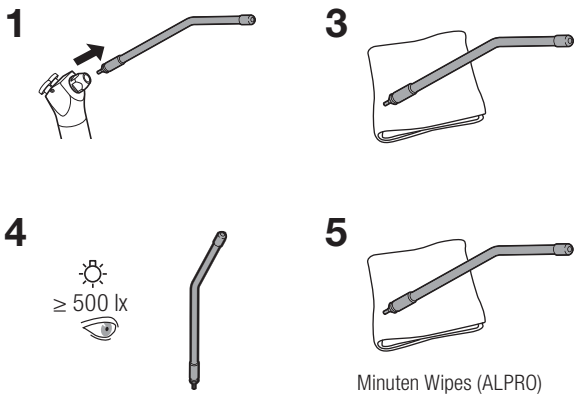
- Do not use a sharp tool to clean the Glass Rod. It could damage the glass and reduce the light transmission.
  When this happens, please contact your Authorized NSK Dealer.

7-3-8 Cleaning and Disinfection of the Scaler Cord

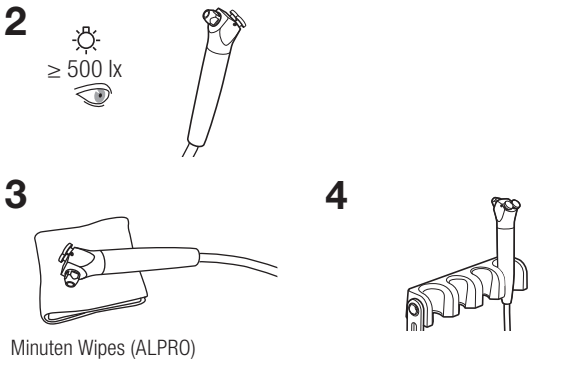
No.	Action	Fig.
< Cleaning >		
1	Remove the all debris on the surface of the Scaler Cord with a cloth moistened with water.	**1**  **2** 
2	Under appropriate lighting (500 lx or higher), inspect the Scaler Cord for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 1.	
< Disinfection >		
1	Wipe the surface of the Scaler Cord and the Holder with disinfectant wipes (Minuten Wipes: ALPRO).	**1**  **2**  Minuten Wipes (ALPRO)
2	Place the Scaler Cord on the Holder.	

7-3-9 Cleaning and Disinfection (Syringe, Syringe Nozzle)

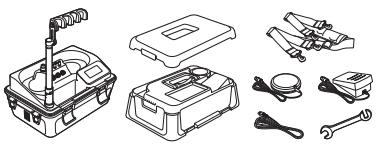
< Syringe Nozzle >

No.	Action	Fig.
1	Remove the Syringe Nozzle from the Syringe.	
2	Clean the outside and the inside of the Syringe Nozzle under running water. * Make sure there is no dirt remaining after cleaning. When there is remaining dirt, repeat cleaning until dirt is completely cleaned away.	
3	Wipe the Syringe Nozzle with a dry cloth.	
4	Under appropriate lighting (500 lx or higher), inspect the Syringe Nozzle for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 2.	
5	Wipe the outside of the Syringe Nozzle with disinfectant wipes (Minuten Wipes: ALPRO). Proceed to "7-4 Sterilization".	

< Syringe (Including the Syringe Hose) >

No.	Action	Fig.
1	Remove the all debris on the surface of the Syringe and Syringe Hose with a cloth moistened with water.	
2	Under appropriate lighting (500 lx or higher), inspect the Syringe and Syringe Hose for contamination. If any visible contamination remains, repeat the process until it is visually clean. Be sure to repeat from the procedure No. 1.	
3	Wipe the surface of the Syringe, Syringe Hose and the Holder with the disinfectant wipes (Minuten Wipes: ALPRO).	
4	Place the Syringe on the Holder.	

7-3-10 Cleaning (Control Unit etc.)

Action	Fig.
Objects: Control Unit, Top Case, Top Cover Case, Shoulder Belt, Foot Control, AC Power Cord, Spanner.	
Turn off the Power Switch of the Control Unit and take out all the accessories. After wiping with the wrung out cloth, then wipe the Control Unit and all the accessories with the disinfectant wipes (Minuten Wipes: ALPRO).	

7-4 Sterilization

Autoclave the Suction Tube and the Syringe Nozzle. Sterilization of the Handpieces, the Motor, the Scaler Handpieces, the Tips and the Tip Wrench should be done in accordance with each operation manual. After each patient, sterilize the parts as follows.

7-4-1 Preparation before sterilization

Insert the autoclavable products and parts individually into a sterilization case or sterilization pouch that conform to ISO 11607-1, and seal the pouch or use the sterilization cassette.
In case of sterilization cassette, insert the Scaler Handpiece, Tip and the Tip Wrench individually into a sterilization cassette then insert the sterilization cassette into a sterilization pouch that conform to ISO 11607-1, and seal the pouch.

7-4-2 Sterilization

Perform autoclave sterilization as follows.

< Motor / Scaler Handpiece / Syringe Nozzle >

Type	Gravity Displacement		Pre-Vacuum (Dynamic Air Removal)
Temperature	121°C (0 / +4°C)	132°C (0 / +4°C)	134°C (0 / +4°C)
Full Cycle Time	20 min or longer	15 min or longer	3-18 min
Drying Time	30 min or longer	30 min or longer	30 min or longer

< Suction Tube >

Type	Pre-Vacuum (Dynamic Air Removal)
Temperature	134°C (0 / +1°C)
Full Cycle Time	3-18 min
Drying Time	30 min or longer

Store the product in a place where it is kept clean and keep it in a sterilization pouch until it is used next.

7-4-2 Sterilization (Continued)

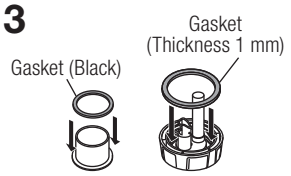
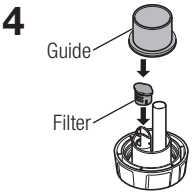
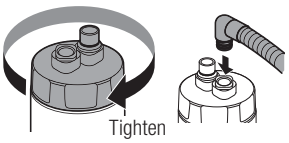
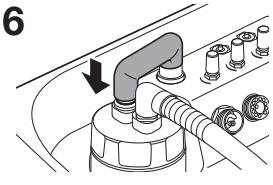
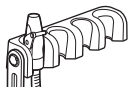
⚠ CAUTION

- Only the Suction Tube and the Syringe Nozzle can be sterilized. No other parts can be sterilized.
  Option parts (Motor and Ultrasonic Scaler) should be maintained in accordance with the attached operation manuals.
- Do not autoclave the product with other instruments even when it is in a pouch. This is to prevent possible discoloration and damage to the product from chemical residue on other instruments.
- Do not heat or cool the product too quickly. Rapid change in temperature could cause damage to the product.
- To avoid product failure, do not use a sterilizer that exceeds a cycle temperature of 138°C, including the dry cycle.
  In some sterilizers, the chamber temperature may exceed 138°C. Contact the sterilizer manufacturer for detailed information about cycle temperatures.
- Keep the product in suitable atmospheric pressure, temperature, humidity, ventilation, and sunlight. The air should be free from dust, salt and sulphur.
- Do not touch the product immediately after autoclaving as it will be very hot and must remain in a sterile condition.
- Autoclave sterilization is recommended for the product. The validity of other sterilization methods is not confirmed.
- Ultraviolet sterilization is not recommended. This could cause discoloration.
  <Suction Tube>
- The expected lifetime may vary by the use condition; approximate lifetime is about 20 sterilizations.
- Be careful not to exceed 135℃ during the drying process. It may cause deformation.

7-5 Maintenance before Use.

7-5-1 Rinsing (Vacuum-related parts)

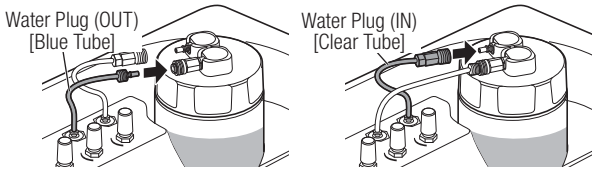
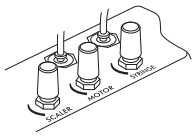
Vacuum-related parts:
Guide, Lid, Gasket (black), Gasket (Thickness 1mm), Filter, Vacuum Cap A/B, Hose Cap, Vacuum Bottle, Vacuum Hose, Suction Tube and Cleaning Adaptor.

No.	Action	Fig.
1	Rinse the Vacuum-related parts which were soaked for over night in disinfection solution with drinking water.	
2	After wiping the Vacuum-related parts with wrung out cloth, wipe with disinfectant wipes (Minuten Wipes: ALPRO). * Suction Tube: Proceed to "7-4 Sterilization".	
3	Attach the Gasket (black) and the Gasket to the Vacuum Bottle Lid.	
4	Attach the Filter and the Guide.	
5	Put the Lid back on to the bottle and connect the Vacuum Hose to the Lid.	
6	Set the Vacuum Bottle in the Control Unit and connect the Vacuum Junction Hose.	
7	Place the Vacuum on the Holder.	

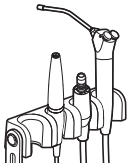
7-6 Maintenance of the Water Line

Disinfection with Alpro Bilpron (undiluted) is recommended as maintenance once or twice a week.

7-6-1 Preparation of the Water Line before Disinfection

No.	Action	Fig.
1	Put 200 mL of disinfectant solution in the Water Bottle. Tightly close the Water Bottle lid and place the Water Bottle in the Control Unit * For details, confirm the operation manuals issued by manufacturer. Disinfectant Solution: Alpro Bilpron (undiluted) * When there is not enough disinfectant solution, turn off the Power Switch of the Control Unit, take out the Water Bottle, and add disinfectant solution.	1  2  4 
2	Insert the Water Plug (OUT) [Blue Tube] and the Water Plug (IN) [Clear Tube] to the lid until hearing a clicking sound.	
3	Turn on the Power Switch of the Control Unit.	
4	Maximize each Water Adjuster.	

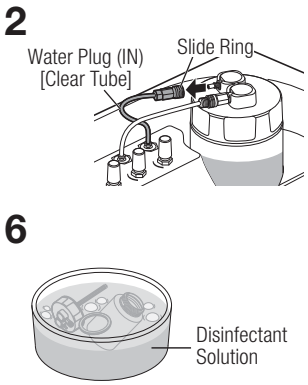
7-6-2 Disinfection (Water Line)

No.	Action	Fig.
1	< Motor / Scaler Handpiece > Select the mode and turn on the SPRAY Key. < Syringe > Connect the Syringe Nozzle that is not disinfected to the Syringe.	1  4 
2	Hold the Motor and the Motor Cord / the Scaler Handpiece and the Scaler Cord / the Syringe in the cleaning tank.	
3	< Motor / Scaler Handpiece > Press the ON/OFF Key for 2 seconds and activate more than 10 seconds to confirm that the disinfectant solution comes out from the tip of the Motor or the Scaler Handpiece. < Syringe > Press the Water Button on the Syringe for more than 10 seconds to confirm that disinfectant solution comes out from the tip of the nozzle.	
4	Place the Motor, the Scaler Handpiece, and the Syringe on the Holder and leave them for a night (at least 12 hours).	

⚠ CAUTION

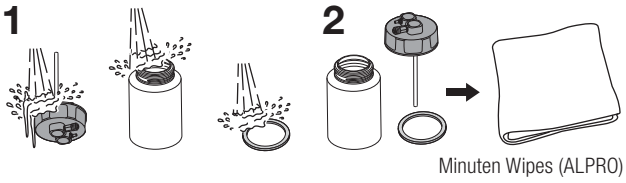
- Disinfectant solution remains in the Water Line by letting the solution out from the tip of the Motor, Scaler Handpiece, and the Syringe.
- It takes 12 hours to complete the disinfection after disinfectant solution remain on the Water Line of the Motor, the Scaler Handpiece, the Tip, Tip Wrench and the Syringe.

7-6-3 Disinfection (Water Bottle)

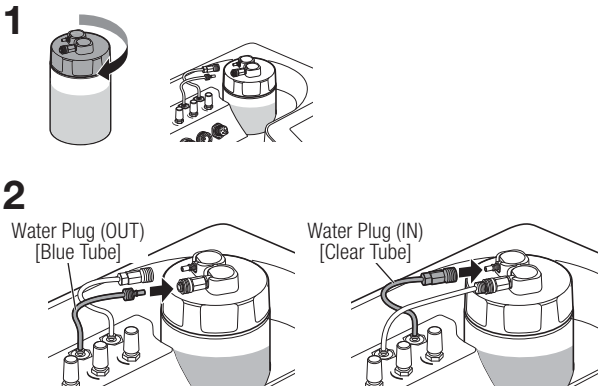
No.	Action	Fig.
1	Turn off the Power Switch of the Control Unit.	
2	Remove the Water Plug (IN) [Clear Tube] while pulling the Slide Ring.	
3	Remove the Water Plug (OUT) [Blue Tube] pressing the Slide Ring.	
4	Remove the Water Bottle from the Control Unit.	
5	Remove the Water Bottle Lid and dispose the disinfectant solution of the Water Bottle.	
6	Remove the Gasket from the Water Bottle. Soak the Water Bottle, Lid and the Gasket in disinfectant solution overnight (more than 6 hours). Disinfectant Solution: · BC San 100: 1pc · Drinking water: 1 - 1.5L	

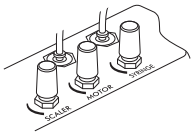
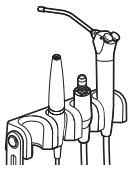
7-6-4 Rinsing of Each Water Line and the Water Bottle after Disinfection

< Water Bottle >

No.	Action	Fig.
1	Take the Water Bottle, the Lid and the Gasket out of the disinfectant solution and rinse the Water Bottle, the Lid and the Gasket with drinking water.	
2	After wiping the Water Bottle, the Lid, and the Gasket with dry cloth, wipe with the disinfectant wipes (Minuten Wipes: ALPRO).	

< Motor / Scaler Handpiece / Syringe >

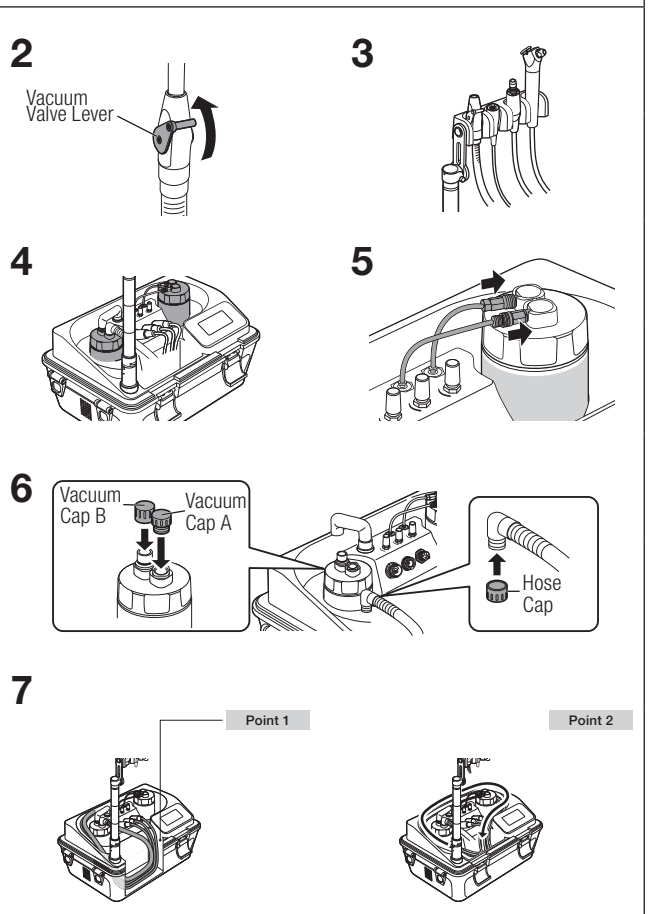
No.	Action	Fig.
1	Put 250 mL of drinking water in the Water Bottle. Tightly close the Water Bottle Lid and place the Water Bottle in the Control Unit. * When there is not enough drinking water, turn off the Power Switch of the Control Unit, take out the Water Bottle, and add drinking water.	
2	Insert the Water Plug (OUT) [Blue Tube] and the Water Plug (IN) [Clear Tube] to the lid until hearing a clicking sound.	

No.	Action	Fig.
3	Turn on the Power Switch of the Control Unit.	4 
4	Maximize each Water Adjuster.	
5	< Motor / Scaler Handpiece > Select the mode and turn on the SPRAY Key. < Syringe > Make sure that the Syringe Nozzle is attached.	5 
6	Hold the Motor and the Motor Cord / the Scaler Handpiece and the Scaler Cord / Syringe in the cleaning tank.	
7	< Motor / Scaler Handpiece > Press the ON/OFF Key for 2 seconds and activate for more than 10 seconds to confirm that drinking water comes out from the tip of the Motor or the Scaler Handpiece. < Syringe > Press the Water Button on the Syringe for more than 10 seconds to confirm that drinking water comes out form the tip of the Syringe Nozzle.	8 
8	Wipe the surface of the Motor, Scaler Handpiece, Syringe Nozzle and the each Cord with disinfectant wipes (Minuten Wipes: ALPRO).	
9	<Motor> Disconnect the Motor from the Motor Cord then attach the sterilized Motor to the Motor Cord and place it on the Holder. * Be sure to sterilize the rinsed Motor (Including Water Line) before use. Reference: "7-4 Sterilization. <Scaler> Disconnect the Scaler Handpiece from the Scaler Cord then attach the sterilized Scaler Handpiece to the Scaler Cord and place it on the Holder. * Be sure to sterilize the rinsed Scaler Handpiece (Including Water Line) before use. Reference: "7-4 Sterilization". <Syringe> Disconnect the Syringe Nozzle from the Syringe then attach the sterilized Syringe Nozzle to the Syringe and place it on the Holder. * Be sure to sterilize the rinsed Syringe before use. Reference: "7-4 Sterilization.	9 

⚠ CAUTION

- After rinsing, be sure to sterilize the Motor, the Scaler Handpiece, and the Syringe Nozzle. Referens "7-4 Sterilization".

8 Storage Procedure

No.	Action	Fig.
1	Turn off the Power and pull the AC Power Cord and the Foot Control Cord.	
2	Close the Vacuum Valve Lever.	
3	Remove the Handpiece, the Syringe Nozzle, and the Suction Tube and place them in the Holder.	
4	Place the Water Bottle and the Vacuum Bottle in the designated position of the Control Unit.	
5	If there is water in the Water Bottle, connect the Water Plug to prevent the water to spill.	
6	Store the Vacuum Bottle after disposing of the sucked liquid (saliva, blood, etc.). When storing without disposing of the sucked liquid, put caps on the Vacuum Bottle and the Vacuum Hose.	
7	After dropping the root part of the cords and hoses into the storage part of the Control Unit, wind the rest of the cords and hoses clockwise. **Point 1** Drop the bundled cords and hoses along the right wall. **Point 2** Wind the rest of the cords and hoses clockwise.	

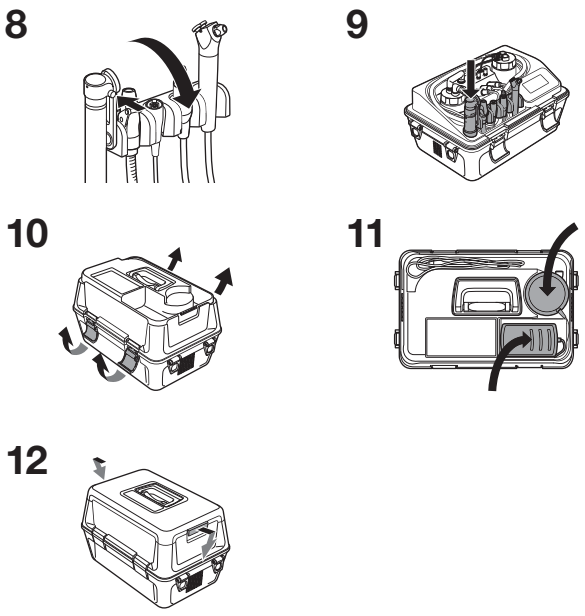
⚠ CAUTION

- Check that the Vacuum Valve Lever is not wet.
  If it is stored wet, it causes the product to become rusty.
- If stored without caps, the sucked liquid (saliva, blood, etc.) may enter the Control Unit because of the vibration while being carried, and may cause abnormal smell and breakage.

NOTICE

- Follow <Point 1> and <Point 2> to store the cords and hoses smoothly.
- Storage of cords and hoses is introduced in a video. Check the URL or the QR code below.

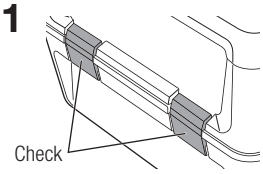
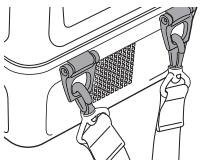
URL
http://www.nsk-dental.com/support/videos/

No.	Action	Fig.
8	Release the Holder Arm Lock, support the Holder to prevent the cords and hoses from dropping, and then turn the Holder slowly until it reaches its lowest to lock.	
9	Pull down the Holder bar slowly while supporting the Holder to prevent the cords and hoses from dropping.	
10	Set the Top Case on the Control Unit and lock the Buckles (4 places).	
11	Store the Foot Control and the Power Cords as in the illustration below.	
12	Put the Top Cover Case on.	

⚠ CAUTION

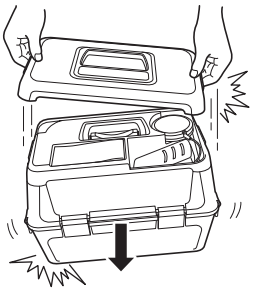
- Be careful not to get the cords and hoses caught in when storing. It may cause damage and breakdown. Also, there is a risk that the Top Case cannot be firmly locked.

9 Transportation

No.	Action	Fig.
1	Confirm that the buckles (4 places) in the front and the back of the Control Unit are firmly locked.	1  2  3 
2	Set the Shoulder Belt securely to the Belt Hook.	
3	Carry the device hung the Shoulder Belt on the shoulder.	

⚠ CAUTION

- If the buckles are not locked firmly the device may drop during transportation and result in a failure and injuries.
- Do not hold the Top Case Cover Latch when carrying the Control Unit. There is a risk that the Control Unit would fall as shown in the illustration, and cause injuries or breakage.
  The Latch is for taking off/putting on the Top Cover Case, not for carrying.

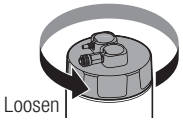
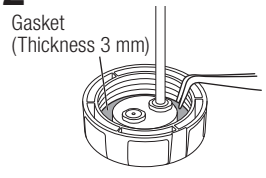


10 Maintenance

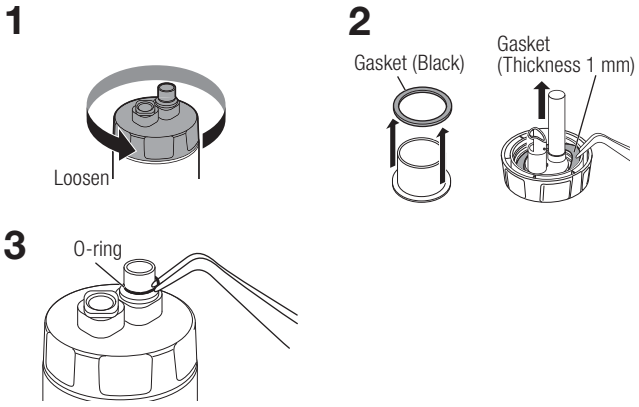
NOTICE

- The order codes for the filter, the Gasket, and the O-ring are on P60. (Reference: 13-2 Spare Parts List)

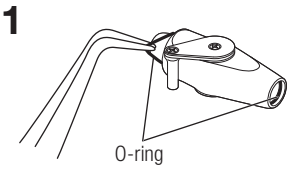
10-1 Replacing the gasket (Water Bottle)

No.	Action	Fig.
1	Take off the Water Bottle Lid.	1  2 
2	Remove the filter from the lid, and then remove the gasket using tweezers.	
3	Place a new Gasket.	

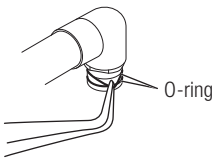
10-2 Replacing the filter, gasket, O-ring (Vacuum Bottle)

No.	Action	Fig.
1	Take off the Vacuum Bottle Lid.	
2	Remove the filter and the guide from the lid, and then remove the gasket (black) and the gasket using tweezers.	
3	Remove the O-ring on the Vacuum Connector using tweezers.	
4	Place a new filter, gasket, and O-ring.	

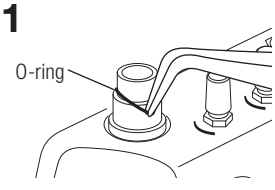
10-3 Replacing the O-rings (Vacuum Valve)

No.	Action	Fig.
1	Remove the O-rings using tweezers.	
2	Place new O-rings.	

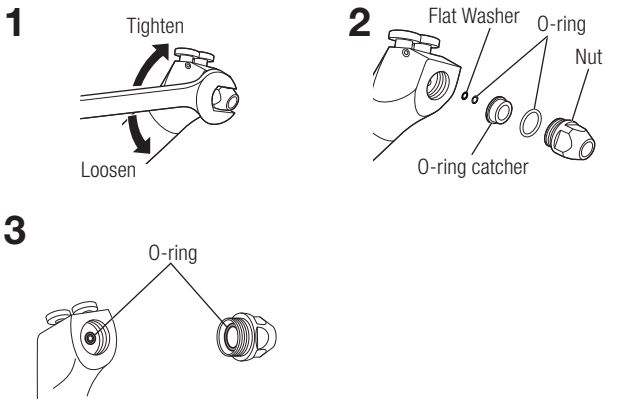
10-4 Replacing the O-rings (Vacuum Hose)

No.	Action	Fig.
1	Remove the O-rings using tweezers.	
2	Place new O-rings.	

10-5 Replacing the O-ring (Vacuum Connector)

No.	Action	Fig.
1	Remove the O-ring using tweezers.	
2	Place a new O-ring.	

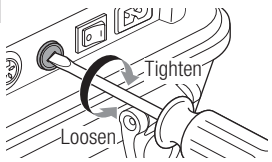
10-6 Replacing the O-ring (Syringe)

No.	Action	Fig.
1	Remove the nut using the attached spanner.	
2	Remove the O-rings using tweezers.	
3	Place new O-rings.	
4	After attaching the O-ring Catcher to the nut, place the nut on the Syringe and tighten lightly with fingers.	
5	Tighten the nut firmly with the attached spanner.	

⚠ CAUTION

- When attaching/removing the nut on the syringe, be careful not to lose the Flat Washer and the O-rings.

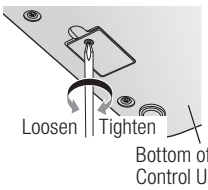
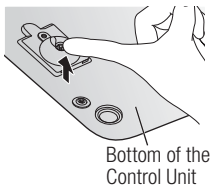
10-7 Replacing the fuse

No.	Action	Fig.
1	Turn off the Power Switch and remove the AC Power Cord.	
2	Using a flathead screwdriver, turn the fuse holder 1/4 in the loose direction slowly, and take it off.	
3	Place a new fuse.	
4	Insert the fuse holder back in to the place and turn it 1/4 in the tightening direction.	

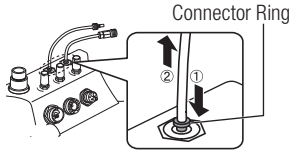
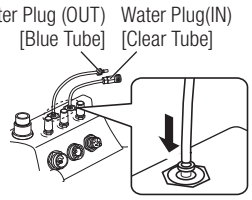
NOTICE

- The order codes for the O-ring and the fuse are on P60. (Reference: 13-2 Spare Parts List)

10-8 Drainage of Air Filter

No.	Action	Fig.
1	Using a cross-head screw driver, remove the filter cover at the bottom of the control unit.	1  2 
2	Press the end part of the air filter for drainage. Prepare for the drainage because the drained water contains air and may spray out onto surrounding objects.	
3	Put the Filter Cover back in place.	

10-9 Replacing the Water Plug

No.	Action	Fig.
1	Pull out the Tube while pressing the Connector Ring.	1  2 
2	Insert the new Water Plug tube until it meets the end. Be sure to place the clear tube on the right and the blue tube on the left.	
3	Check by pulling and pushing that the tube is securely set.	

10-10 Periodical Maintenance Checks

Every 3 months perform periodical maintenance checks, referring to the check sheet below. If any abnormalities are found, contact your Authorized NSK Dealer.

Points to check	Details
Control Unit, Top Case, Top Case Cover	Check if there is no discoloration, deformation, or breakage.
	No major rattling or looseness is noticed.
Operation of the Control Unit	No abnormal noise is heard.
	Display panel displays the information properly.
Drainage of Air Filter	Drain the Air Filter. (Reference : 10-8 Drainage of Air Filter)
Vacuum	Suctioning operates properly.
Vacuum Bottle	Check that there is no foreign substance such as chip powder is gathered in the filter and the float spindle on the lid.
Syringe	Water and air operates properly.
	The Syringe Nozzle is not loose.
	The Nut on the syringe is not loose.
Connecting and Disconnecting the cords and hoses	They can be connected securely without any rattling and looseness.
Watering	No leakage when water is applied.

11 Troubleshooting

11-1 Error Code

In the case of abnormalities an Error Code will be displayed in the display panel. Immediately stop all the devices when an error code is displayed. Press Motor/Scaler ON/OFF Key or step on the foot control (FC-76S) again or turn on the device again to see if the error is canceled. If the error code is displayed again, refer to the following table and take appropriate actions.
When the error is not eliminated, a failure of this device is suspected. Contact your Authorized NSK Dealer.

Error Code	Object	Cause of the Error	Remedy
Err 00	Motor	Exceeding the maximum set torque value	Release the motor from the load.
Err 01		Abnormal electric current flows into the motor and the circuit	Contact your Authorized NSK Dealer.
Err 02		Much electricity has flown for an extended period	
Err 03		Overcurrent detected in the motor driver	
Err 04		Using the motor for an extended period	Cool down the motor.
Err 05		Too much voltage is applied to the control unit	Contact your authorized NSK Dealer.
Err 06		Too much voltage is applied from the internal circuit	
Err 07		Error in Motor output circuit	
Err 08		Used in an extended period exceeding the set value	Remove the load from the motor and the handpiece, then release the foot control.
Err 09		Insufficient connection of the motor cord	Check that the motor is correctly connected to the motor cord.
		The electric circuit broke down	Contact your Authorized NSK Dealer.
Err 10		Voltage reduction of the LED lamp	
Err 12		Communication abnormality inside the motor	
Err 13		Load on the motor, Power failure	
Err 14		Failure in the parts that record the set value	
Err 16	Vacuum	Vacuum Motor abnormality.	
Err 17	Compressor	Compressor abnormality (Open phase, low voltage, excessive load)	Check that the syringe hose is not twisted or stepped on.
			Turn off the Power Switch and turn it on again while pressing the Air Button on the syringe. Then keep pressing the Air Button for 3 minutes. If the error is not eliminated after the procedure above, repeat the procedure a few times. When the error continues to appear, a failure of the device is suspected. Contact your Authorized NSK Dealer.

11-1 Error Code (continued)

Error Code	Object	Cause of the Error	Remedy
Err 18	Control Unit	Abnormal pressure (Abnormality in the AD value of the pressure sensor)	Contact your Authorized NSK Dealer.
Err 19		Abnormal temperature in the Control Unit	Use within the temperature range of the use environment.
Err 20		Failure in the parts that record the set value	Contact your authorized NSK Dealer.
Err 21		Communication error with the motor	Frequent turning on and off the Power Switch could cause the Error to be displayed. Try to avoid frequent turning on/off. When the error is not eliminated, Contact your Authorized NSK Dealer.
Err 22		Communication error with the scaler	
Err 23		Program Error	
Err 25		Abnormal voltage	
Err 26		Abnormal voltage	
Err 29	Scaler	Insufficient connection of the handpiece	Check that the handpiece is correctly connected to the scaler cord.
		Program Error	
Err 31		Program Error	Contact your Authorized NSK Dealer.

11-2 Problems and Solutions

When a problem is detected, check the following again before requesting a repair.
If none of these is applicable or if the trouble is not remedied even after an action has been taken, a failure of this product is suspected.
Contact your Authorized NSK Dealer.

Problem	Cause	Remedy
No display when turning on the switch.	Insufficient connection of the power cord.	Check the connection.
	Fuse blown	Replace the fuse.
The Motor/Scaler does not function. It functions by operating the control panel, however not by the foot control.	Failure in Foot Control.	Contact your Authorized NSK Dealer
The Motor/Scaler does not function. It does not function by both control panel and foot control operations.	Failure in Motor/Scaler or Control Unit.	
Water force is not enough when using the Motor/Scaler.	Water is stagnating in the Air Filter	Drain the Air Filter. (Reference :10-8 Drainage of Air Filter)
The Vacuum does not suck.	Vacuum Junction Hose is not connected properly.	Securely connect the Vacuum junction hose. (Reference : 5-6 Installing the Vacuum Hose)
	Failure in Vacuum.	Contact your Authorized NSK Dealer.
	Foreign substance has entered the Vacuum.	Remove the foreign substance.
	Looseness of the Vacuum Bottle Lid.	Securely close the lid.
	The Vacuum Bottle is filled.	Dispose of the sucked liquid.
Water is not enough.	Water Supply Plug/Air supply Plug is not connected properly.	Check the connection of the Water Plug.
	Failure in Compressor.	Contact your Authorized NSK Dealer.
	Foreign substance has entered water the circuit.	
No water/air is supplied from the Syringe.	Water Supply Plug/Air supply Plug is not connected properly.	Check the connection of the Water Plug.
	The syringe hose is bent, or foreign substance entered.	Stretch the bend of the hose, or remove the foreign substance.
Air force from the Syringe is weak, or there is no air from the Syringe	Water is stagnating in the Air Filter	Drain the Air Filter. (Reference : 10-8 Drainage of Air Filter)
	The Air Filter clogging.	

12 Specifications

12-1 Specifications

Model	VIVA ace
Dimension	W438 x D298 x H284 mm (Belt Hook not included)
Weight	8.5 kg (Basic Set)

<Control unit>

Model	NE322
Power-supply voltage	AC100 – 240 V
Power frequency	50/60 Hz
Power input	130 VA
Vacuum suction force	3.3 – 4.0 kPa (±10%)
Vacuum suction amount	90L/min or more

<Foot Control>

Model	FC-70S	FC-76S
Cord length	1.5 m	1.5 m
Dimension	Ø100 x H24.5 mm	W80 x D136 x H60 mm
Weight	120 g	215 g
Purpose	For Vacuum	For Motor and Scaler

<HVE Suction Tube>

Remarks	Outside diameter Ø11 mm 93/42/EEC compliant Suction Tube

	Temperature	Humidity	Pressure
Use environment	0 – 40°C	30 – 75%*	
Transportation and Storage environment	-10 – 50°C	10 – 85%*	500 – 1,060hPa

*No condensation

12-2 Classification of Equipment

- Type of protection against electric shock:
  Class II Equipment ⧈
- Degree of protection against electric shock:
  Type B applied part (applied part:Tip, Bur, Handpiece, Suction Tube, Syringe Nozzle)
- Method of sterilization or disinfection recommended by the manufacturer:
  Reference:7-4 Sterilization
- Degree of protection against ingress of water as detailed in the current edition of IEC 60529:
  Control Unit, Foot Control ··· IP21 (Protected against solid matters with diameter of more than 12.5 mm.)
- Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide:
  Equipment NOT suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Mode of operation:
  Intermittent operation device (ON:2 minutes, OFF:3 minutes)

12-3 Symbol

This product is Autoclavable up to Max. 135ºC.

Conforms to CE European Directive of “Medical device directive 93/42/EEC.”

This product can be cleaned using washer-disinfector.

Manufacturer.

Authorized representative in the European community.

Follow the waste of electric and electronic equipment (WEEE) Directive (2012/19/EU) for product and accessory disposal.

Consult operation instructions.

Caution, Refer to attached instructions.

Class II equipment.

Type B applied part.

Protected against solid matters with diameter of more than 12.5 mm.

Marking on the outside of Equipment or Equipment parts that include RF transmitters or that apply RF electromagnetic energy for diagnosis or treatment.

TUV Rheinland of North America is a Nationally Recognized Testing Laboratory (NRTL) in the United States and is accredited by the Standards Council of Canada to certify electro-medical products with Canadian National Standards.

Caution: U.S. Federal law restricts this device to sale by or on the order of a licensed physician.

Serial No.

13 After-sales Service

13-1 Warranty

NSK products are warranted against manufacturing errors and defects in materials. NSK reserves the right to analyze and determine the cause of any problem. Warranty is voided should the product be not used correctly or for the intended purpose or has been tampered with by unqualified personnel or has had non NSK parts installed. Replacement parts are available for seven years beyond discontinuation of the model.

13-2 Spare Parts List

<Vacuum>

Model	Order Code	Remarks
V-ace Vacuum Hose Set	U1144074	A set of Vacuum Valve, Vacuum Hose, O-rings, and Hose Cap.
O-ring Set	Y1003572	A set of 2, For Vacuum Hose
O-ring	D0312107150	For Suction Tube side of the Suction Tube
O-ring	D0312100150	For Vacuum hose side of the Suction Tube

<Vacuum Bottle>

Model	Order Code	Remarks
Gasket	U1144636	Thickness 1 mm
Gasket (Black)	Z1137352	-
Filter	U1144727	-
O-ring	D0312130100	For Vacuum Connector and Control Unit

<Syringe>

Model	Order Code	Remarks
V-ace 3 way Syringe Set	U1144040	A set of Syringe and Syringe Nozzle
O-ring Set	Y1003573	A set of 2 (large and small), For Syringe
Flat Washer	U1144430	For Syringe

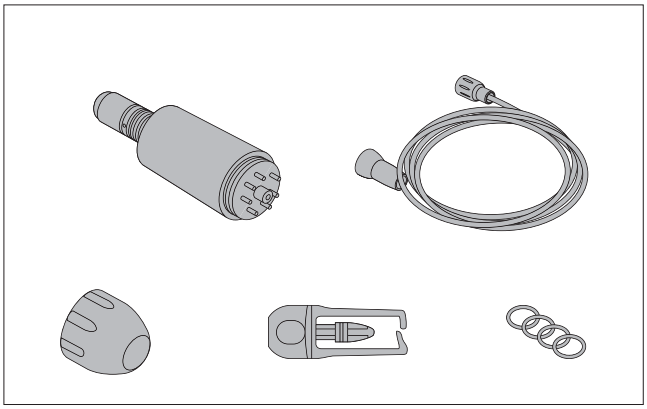
<Water Bottle>

Model	Order Code	Remarks
Gasket	U1144729	Thickness 3 mm

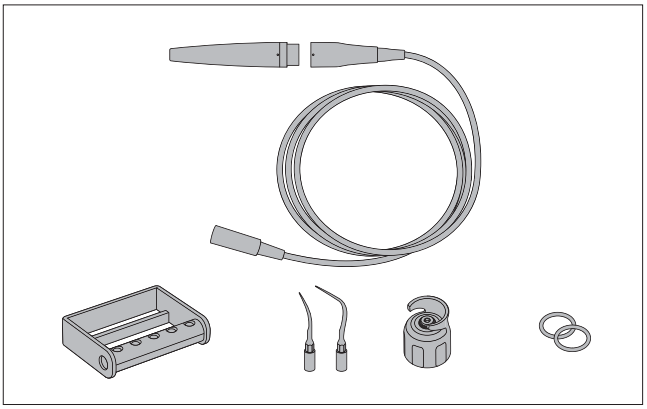
<Control Unit>

Model	Order Code	Remarks
O-ring	D0312130100	For Vacuum Connector
Fuse	D1202231510	T3.15AH 250V
Water Plug Set	Y1003730	A set of Water Bottle (IN) [Clear Tube] and Water Bottle (OUT) [Blue Tube]

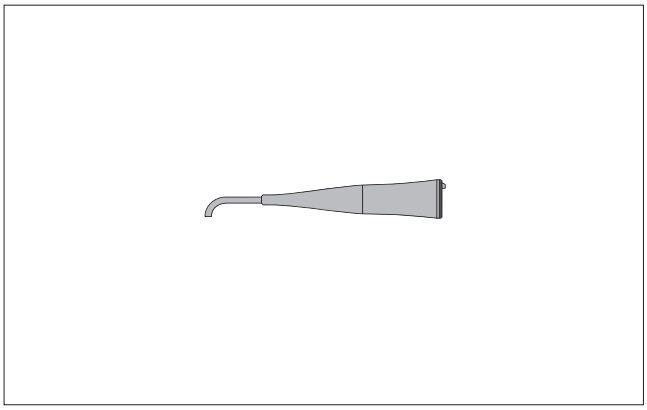
13-3 Option Parts List



Model	Order Code
VIVA ace Motor Kit	E1040002



Model	Order Code
VIVA ace Scaler Kit	E351006



Model	Order Code
isoE-LUX (Light Probe)	Z1265

13-4 Disposing product

In order to avoid the health risks of operators handling the disposal of medical equipment, as well as the risks of environmental contamination caused thereof, a surgeon or a dentist is required to confirm the equipment is sterile. Ask specialist firms who are licensed to dispose of specially controlled industrial wastes, to dispose the product for you.

14 EMC Information (Electromagnetic Compatibility Information)

Guidance and manufacturer's declaration - Electromagnetic Emissions		
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR11/EN55011	Group 1	The product uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR11 EN55011	Class B	The product is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions EN/IEC61000-3-2	Class A (except 120V)	
Voltage fluctuations/flicker emissions EN/IEC61000-3-3	Complies (except 120V)	

Guidance and manufacturer's declaration - Electromagnetic Immunity			
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.			
Immunity test	EN/IEC60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	±1kV line(s) to line(s) ±2kV line(s) to earth	±1kV line(s) to line(s) ±2kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5% Ut (>95% dip in Ut) for 0.5 cycles 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) For 25 cycles <5% Ut (>95% dip in Ut) for 5 sec	<5% Ut (>95% dip in Ut) for 0.5 cycles 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) For 25 cycles <5% Ut (>95% dip in Ut) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the product requires continued operation during power mains interruptions, it is recommended that the product be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE : 'Ut' is the AC mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - Electromagnetic Immunity			
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.			
Immunity test	EN/IEC60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC61000-4-6 Radiated RF IEC61000-4-3	3Vrms 150kHz to 80MHz 3V/m 80MHz to 2.5GHz	3Vrms 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the product, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80MHz to 800MHz $d=2.3\sqrt{P}$ 800MHz to 2.5GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, and (d) is the 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 meters (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: 
NOTE1: At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE2: 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 land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the product is used exceeds the applicable RF compliance level stated above, the product should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the product.			
b: Over the frequency range 150 kHz to 80 MHz, the field strength should be less than 3 V/m			

EMC Information

Cables and accessories	Maximu	Complies with	
AC Power Cord	2m (Unshielded)	RF emissions, CISPR11	Class B/Group 1
		Harmonic emissions	EN/IEC61000-3-2, Class A
		Voltage fluctuations/flicker emission	EN/IEC61000-3-3
Foot Control (FC-76S)	1.5m (Unshielded)	Electrostatic discharge (ESD)	IEC61000-4-2
		Electrical fast transient/burst	IEC61000-4-4
		Surge:	IEC61000-4-5
		Voltage dips, short interruptions and voltage variations on power supply input lines	IEC61000-4-11
Foot Control (FC-70S)	1.5m (Unshielded)	Power frequency (50/60Hz) magnetic field	IEC61000-4-8
		Conducted RF:	IEC61000-4-6
		Radiate RF	IEC61000-4-3

Recommended separation distances between portable and mobile RF communications equipment and the product

The product is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled.
The customer or the user of the product can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the product 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 $d=1.2\sqrt{P}$	80MHz to 800MHz $d=1.2\sqrt{P}$	800MHz to 2.5GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance "d" in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where "P" is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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