



Ultrasonic & Powder Combination System

Varios Combi Pro2

OPERATION MANUAL

- English

CE 0197 MADE IN JAPAN



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1 Preface

1.1 User and intended purpose

- User

Dentist, dental hygienist

- Intended purpose

The dental device is intended for the following application(s):

[Tooth Polishing System]

Removal of supragingival and subgingival accretions and deposits, and accretions and deposits on prostheses (including implants).

[Ultrasonic Scalers]

Removal of accretions and deposits from the surface of teeth and dental restorations (fillings and prostheses), finishing (preparation and adjustment/polishing), removal and cleaning of infected dental tissues, and root canal preparation.

- Intended patient population

For ages 2 and up

1.2 Related manuals

For proper use with the combined items, refer to the following operation manuals:

Operation manual title	Operation manual No.
Water Bottle Kit OPERATION MANUAL	OM-DE1186MA
CLM Module OPERATION MANUAL	OM-DE1196MA
Perio Kit2	OM-DE1243MA
Prophy Kit2	OM-DE1245MA
Varios Handpiece OPERATION MANUAL	OM-DE0981MA
Varios Tips VarioSurg Tips OPERATION MANUAL	OM-Z0288E
Varios Tips OPERATION MANUAL	OM-Z0314E
Perio Mate Powder OPERATION MANUAL	OM-DT0939MA
FLASH pearl OPERATION MANUAL	OM-DZ0943MA
SOFT pearl OPERATION MANUAL	OM-DT0974MA
CLA-10 OPERATION MANUAL	OM-DE0982MA
CLA-20 OPERATION MANUAL	OM-DE0906MA

1.3 Precautions for handling and operation

- Read these safety cautions thoroughly before use and operate the product properly.
- These indicators are to allow you to use the product safely, prevent danger and harm to you and others. These are classified by degree of danger, damage and seriousness. All indicators concern safety, be sure to follow them.

Class	Degree of risk
!CONTRA-INDICATIONS	Specific medical reason for not using the device : i.e. health condition of the patient.
!WARNINGS	Failure to follow the warning could result in death or serious injury.
!PRECAUTIONS	Means that, in case the precaution is not taken, it may cause minor or moderate injury.
NOTICE	General product specification information highlighted to avoid product malfunction and performance reduction.

!CONTRA-INDICATIONS	Ultrasonic	Prophy	Perio
<ul style="list-style-type: none"> Do not use this product on the following patients. <ul style="list-style-type: none"> Patients (including infants) and users with external/implantable pacemakers and implantable cardioverter defibrillators. It may affect the operation of external/ implantable pacemakers and implantable cardioverter defibrillators. Those with allergies (*). <p>Note (*): Depending on the patient's constitution, allergy symptoms or stomatitis may be caused in very rare cases. If such symptoms are detected, stop using the product immediately and seek medical attention.</p> Those who have preexisting conditions (e.g., cardiac, pulmonary, renal disturbance, or high blood pressure). Those with respiratory diseases. Those with pathologically deep periodontal pockets (9 mm or more) or mucosal lesions. Prolonged application of the spray to soft tissue or salivary glands may cause powder air to enter soft tissue or salivary glands, resulting in emphysema. Those with severe digestive ulcers. Those with an artificial heart valve or artificial joint. Those with damage or abnormality in the oral cavity. Those with hyperemia, hemorrhage or inflammation in the oral cavity. Those who tend to develop inflammation or sores in the oral mucous membrane. Using on deep periodontal pockets of the following patients may result in bacillaemia: <ul style="list-style-type: none"> Those who are pregnant, potentially pregnant, or breastfeeding. 	✓	✓	✓

!WARNINGS		Ultrasonic	Prophy	Perio
• Do not use in rooms with a risk of explosion or near flammable substances. Also; do not use on or near patients under flammable anesthesia (nitrous oxide).		✓	✓	✓
• This product is for indoor use only.		✓	✓	✓
• In case air is blown into the blood stream, there is a risk of air embolism and/or emphysematous tissue changes.			✓	✓
• Spraying the powder accidentally into the eyes may cause severe eye injury. If this product gets into the eyes, immediately rinse the eyes with plenty of water and consult an ophthalmologist.			✓	✓
• Please report any serious incident that may occur in connection with this product and its accessories to the manufacturer as well as to your national authority.		✓	✓	✓
• U.S. Federal law restricts this device to sale by or on the order of a licensed physician.		✓	✓	✓
• Follow the instructions in the Operation Manual for NSK powder.			✓	✓
Designated items		✓	✓	✓
• Be sure to use only the accessories of this product included in the package and NSK's genuine products (designated items). The user is liable for accidents and malfunctions that occur as a result of the use of items other than the accessories of this product included in the package and NSK's genuine products (designated items).				

⚠️WARNINGS	Ultrasonic	Prophy	Perio
<ul style="list-style-type: none"> The user is liable for accidents and malfunctions that occur as a result of the use of powder other than those designated by NSK. Therefore, use only NSK's genuine powder. The use of an item other than those designated may cause malfunction of the device, damage to the cementum or dentine, and emphysema. Use NSK's genuine tips and nozzle tip. The use of an item other than those designated may cause the following faults or unexpected accidents: <ul style="list-style-type: none"> Inappropriate vibration caused by forcible attachment of a tip of another manufacturer. Powder injection failure caused by forcible attachment of a nozzle tip of another manufacturer. Accidental ingestion of a broken tip by the patient. Damage or premature wear of the ultrasonic handpiece threads. Use NSK's genuine handpiece (designated item). The use of an item other than those designated may cause the following faults or unexpected accidents such as inappropriate vibration or powder injection failure caused by forcible attachment of a handpiece of another manufacturer. 	✓	✓	✓

⚠️PRECAUTIONS	Ultrasonic	Prophy	Perio
General precautions <ul style="list-style-type: none"> This product is a medical device. Observe this manual's instruction concerning the device, intended user and use method when using this product. When operating the product, always consider the safety of the patient. The user shall be responsible for any judgment that relates to the application of this product to a patient. The user is responsible for the operational control, maintenance, and continual inspection of this product. Read this operation manual before use to fully understand the product functions and file for future reference. 	✓	✓	✓
Environment <ul style="list-style-type: none"> Before unpacking this product, make sure that the packaging has not been opened, tampered with, or damaged. If it has been opened or damaged, there may be a risk of malfunction or contamination. Stop use and contact your authorized NSK dealer. Install, use and store this product in a location that meets the requirements for the storage and use environment, and does not produce condensation. Otherwise, it may cause malfunction; refer to "10 Specification". 	✓	✓	✓

⚠ PRECAUTIONS		Ultrasonic	Prophy	Perio
EMC				
<ul style="list-style-type: none"> This product is rated medical electrical equipment. EMC (Electromagnetic Compatibility) is described in the documentation included. This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information. The use of accessories, handpieces, handpiece cords, and handpiece hoses other than those specified, with the exception of those sold by the manufacturer of the Varios Combi Pro2 series as replacement parts for internal components, may result in increased emissions or decreased immunity of the control unit. This product may be affected when used in the presence of an electromagnetic interference wave. Do not install this product in the vicinity of any device which emits electromagnetic waves. Turn off this product when using an ultrasonic oscillation device or an electrode knife near this product. Portable and mobile RF (Radio Frequency) communications equipment can affect this product. Do not use RF equipment in the vicinity of the product. Do not place any magnetic objects near the control unit. 	✓	✓	✓	
Installation				
<ul style="list-style-type: none"> 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. Install the control unit in a level and stable location. For the sake of safety, leave space of more than 10 cm around the wall outlet specified for medical use to enable the AC power cord to be unplugged immediately. (It is possible to disconnect the control unit from the power source by removing the AC power cord.) 	✓	✓	✓	
Connection				
Electrical connection				
<ul style="list-style-type: none"> Push the AC power cord securely and fully into the outlet and the control unit inlet when connecting. Be sure to plug the AC power cord into a wall outlet specified for medical use with a dedicated ground terminal. If a short circuit occurs inside this product, it may cause an electric shock and/or fire. Do not handle the AC power cord with wet hands. Doing so may cause an electric shock. 	✓	✓	✓	

⚠ PRECAUTIONS		Ultrasonic	Prophy	Perio
• Make sure that the device is stopped before plugging or unplugging the AC power cord.		✓	✓	✓
Water connection				
• Connect to a public water system/Water Bottle Kit that provides drinkable water at a water pressure 0.1-0.3 MPa (1.0-3.0 kgf/cm ²). Using with an incorrect water pressure may result in insufficient water levels, inoperability, or malfunction.	✓	✓	✓	✓
• Use a water softener, etc., to lower the hardness of the water, because using water with a high degree of hardness may cause mineral or limescale deposits in the water circuit, which can lead to problems such as insufficient water levels, operation problems, or breakdown.	✓	✓	✓	✓
• In addition, replace the water filter as required to prevent device breakdown due to the foreign material in tap water. => "6.3 Replacing the water filter"	✓	✓	✓	✓
• Be sure to use the drinking water with salinity concentration of 0.5 wt% or less and temperature less than 35 °C. Using other liquids may cause water clogging or metal corrosion. If chemicals are used instead of drinking water, additional cleaning may be required.	✓	✓	✓	✓
Air connection				
• Set the supply air pressure to 0.45-0.75 MPa and use clean and dry air. Using with the incorrect pressure may result in insufficient spray pressure (power), inoperability or malfunction.	✓	✓	✓	✓
• Make sure the air supply is clean and dry. Water or oil content mixed in the air supply may cause solidification of the powder.	✓	✓	✓	✓
Inspection				
• Be sure to perform inspection by operating the product with each connecting part mounted before use; refer to "3.15 Check before treatment". If any abnormal condition is detected, stop using the product and contact your authorized NSK dealer.	✓	✓	✓	✓
• Before connecting the products, make sure that there is no dirt or foreign object adhered to each connection part. If there is any dirt or foreign object, clean it off.	✓	✓	✓	✓
• To prevent powder from solidifying and plugging, be sure to blow dry air against the product surface and connection parts to remove moisture before connecting the handpiece hose, chamber, and powder handpiece.		✓	✓	✓
Preparation of the device				
• Push the handpiece securely and fully onto the handpiece cord or handpiece hose when connecting (*).	✓	✓	✓	✓

⚠ PRECAUTIONS	Ultrasonic	Prophy	Perio
<p>Note (*): Hold the connector part when pulling out the handpiece cord or handpiece hose. Pulling the cord or hose may cause a broken wire or damage.</p> <ul style="list-style-type: none"> Fill the chamber slowly and be sure to prevent the powder from scattering and entering eyes, being inhaled and entering device. If too much powder is put into the chamber, the proper amount of powder may not be sprayed at the start of use. Powder scatters easily because it is very fine. Powder stored for a long time in opened packaging may become moist and clog the nozzle. Always use new, dry powder. When using bottled powder, securely fasten the bottle cap after filling. After filling the powder, securely tighten the chamber lid. Otherwise, the chamber lid may be blown off during use, which may lead to damage to the device or an injury. If the product has not been used for a long period, check that it is functioning correctly and safely before using on a patient. When installing nozzle tip (STERILE EO) <ul style="list-style-type: none"> The nozzle tip is a single-use item. Do not reuse or re-sterilize it as product breakage or infection could occur. Check before use that the package is not open or damaged. If the package is open or damaged, do not use the nozzle tip as product breakage or infection could occur. Observe the use-by date written on the nozzle tip package. Do not use expired products as product breakage or infection could occur. 	✓	✓	✓
<p>Before use</p> <ul style="list-style-type: none"> Observe the following instructions laid down by in this manual when using the NSK tooth surface cleaning device to protect users, assistants and patients from this product. <p>Users and assistants: Wear eye protection, masks and gloves</p> <p>Patients: Check the depth of periodontal pockets with a measurement probe or radiography before use</p> <p>Spread petroleum jelly on the corners of the patient's mouth to avoid drying and cracking.</p> <p>Protect face with a towel or protective glasses.</p>	✓	✓	✓

⚠ PRECAUTIONS		Ultrasonic	Prophy	Perio
During use				
<ul style="list-style-type: none"> For the sake of safety of the patient and medical professionals, use a suction device and wear eye protection and protective mask during the use of this product. 	✓	✓	✓	
<ul style="list-style-type: none"> If any powder gets into the eyes, wash the eyes immediately with a large amount of water and consult an ophthalmologist. 		✓	✓	
<ul style="list-style-type: none"> Do not aim the light of the ultrasonic handpiece or handpiece cord at the eye of the patient, operator, or assistant. Doing so may damage eyesight. 	✓			
<ul style="list-style-type: none"> Do not open the chamber lid during use. Doing so may result in the cap being blown off and powder being ejected due to high pressure in the chamber. 		✓	✓	
<ul style="list-style-type: none"> Never direct the powder jet directly on to the cementum, on the roots of teeth, decalcified enamel, filling materials, margins of prosthetic appliances and filling materials, crowns, etc. 		✓		
<ul style="list-style-type: none"> Before using a file as a tip for expanding the root canal, understand the features and applicable regions of the file. 	✓			
<ul style="list-style-type: none"> Air containing powder is sprayed into periodontal pockets. Pay attention not to cause emphysema. If emphysema is caused by treatment using perio mode, stop using this product immediately and seek medical attention. 				✓
<ul style="list-style-type: none"> Do not bend the handpiece cord or handpiece hose at excessive angles. This may result in a decrease in the amount of irrigation or powder spray. 	✓	✓	✓	
<ul style="list-style-type: none"> Should the product function abnormally, stop using the product immediately and contact your authorized NSK dealer. 	✓	✓	✓	
<ul style="list-style-type: none"> If the product produces smoke or smells of burning resin, immediately turn off the power, unplug the AC power cord, and then contact your authorized NSK dealer. 	✓	✓	✓	
<ul style="list-style-type: none"> Be careful not to get water or liquid disinfectant such as mouthwash (hereafter refer to as liquid disinfectant) in the control unit. This could cause short circuits and lead to an electric shock. 	✓	✓	✓	
<ul style="list-style-type: none"> Do not turn on and off the power repeatedly. Doing so may blow a fuse. 	✓	✓	✓	
<ul style="list-style-type: none"> If water droplets, chemicals, solvents, or liquid disinfectant come into contact with this product (including each part and each connection part), wipe them off immediately after the use. Failure to do so may result in discoloration or deformation. 	✓	✓	✓	
<ul style="list-style-type: none"> During handling, do not drop, hit, or subject to excessive shock. <ul style="list-style-type: none"> For ultrasonic handpiece: Glass rod and ultrasonic handpiece may be damaged. For powder handpiece: Nozzle may be deformed. 	✓	✓	✓	
		✓	✓	

⚠ PRECAUTIONS		Ultrasonic	Prophy	Perio
<ul style="list-style-type: none"> Always use irrigation in normal use (except for dry tips, which do not require coolant water). If there is insufficient irrigation, the product will overheat and may injure the tooth surface. The product surface may reach the following temperature when using a dry tip continuously for 23 minutes in a room temperature of 26 °C. If the product becomes hot, stop use and leave it for approximately 10 minutes until it cools down. Tip : 29 °C Titanium handpiece (VA2-LUX-HP Ti) : 41.2°C The product surface temperature may reach the following temperature when using the product under the NSK specified conditions (35°C, G8 tip, G mode, power 10, continuous load for a long time). If the product becomes hot, stop use and leave it for approximately 10 minutes until it cools down. Titanium handpiece (VA2-LUX-HP Ti) : 50.1 °C If the heater or heater control malfunctions, the maximum temperature of the handpiece and irrigation may reach 50.9°C. If any abnormality is detected in the irrigation temperature, stop using the product and contact your authorized NSK dealer. 	✓			
After use (patient)			✓	✓
<ul style="list-style-type: none"> Instruct the patient to avoid smoking and foods and drinks that color the teeth for two to three hours after the cleaning of tooth surfaces. 	✓	✓	✓	
After use (product)			✓	✓
<ul style="list-style-type: none"> After using this product, turn off the power switch. When you intend to leave this product without using it for a long time, unplug the AC power cord and drain water from the control unit. 	✓	✓	✓	
Post-use maintenance			✓	✓
<ul style="list-style-type: none"> Immediately after using this product on a patient, clean, disinfect, and sterilize this product with the correct method; refer to "5 Post-use Maintenance". Do not sterilize the following products: <ul style="list-style-type: none"> Control unit, foot control, handpiece cord, handpiece hose, irrigation bottle, CLM bottle, Chamber, CLA-10 and CLA-20. About sterilizable products: <ul style="list-style-type: none"> Clean, disinfect, and sterilize it following the instructions in this manual before use. => "5 Post-use Maintenance" Do not sterilize using ultraviolet light. Doing so may result in discoloration. 	✓	✓	✓	

⚠ PRECAUTIONS	Ultrasonic	Prophy	Perio
<ul style="list-style-type: none"> The effectiveness of sterilization methods other than autoclave sterilization is not verified. 	✓	✓	✓
Maintenance			
<ul style="list-style-type: none"> Do not attempt to disassemble the product or tamper with the mechanism except as recommended by NSK in this manual. To avoid clinical downtime, it is recommended that a spare be kept on hand in case of a breakdown during operation. Be sure to conduct periodical maintenance check on the device and parts (*). <p>Note (*):The glass rod of the ultrasonic handpiece can deteriorate as a result of a long term use over the lifetime of the device.</p>	✓	✓	✓

NOTICE

- No special training is required for this device.
- Substances which are carcinogenic, mutagenic or toxic to reproduction ('CMR'), of category 1A or 1B, in accordance with Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council, or substances having endocrine-disrupting properties for which there is scientific evidence of probable serious effects to human health and which are identified either in accordance with the procedure set out in Article 59 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council or, once a delegated act has been adopted by the Commission pursuant to the first subparagraph of Article 5 of Regulation (EU) No 528/2012 of the European Parliament and the Council, in accordance with the criteria that are relevant to human health amongst the criteria established therein: lead (Pb), cobalt (Co).
This product can be safely used in the treatment of children or other patient groups considered particularly vulnerable to such substances (except for pregnant or breastfeeding women).



1.4 Symbol



ON state of main power switch



OFF state of main power switch



Temperature



Ultrasonic bath

	The instrument can be used with a washer-disinfector for thermal disinfection
	This product can be sterilized in a steam sterilizer at 135 °C
	Lamp/lighting/illumination
	Drinking water
	Visual check
	Consult operation instructions
	Caution
	Type B applied part
	Marking on the outside of equipment or equipment parts that include RF transmitters or that apply RF electromagnetic energy for diagnosis or treatment
	Protected against dripping
	
	Dispose of this device and its accessories via methods approved for electronic device and in compliance with the Directive 2012/19/EU
	Conforms to European "Medical Device Regulation"
	The CE marking certifies that this product has met legal requirements in force in the European Union (EU).
	Manufacturer
	Importer
	Authorized representative in the European Community
	
	Authorised representative for Switzerland
	Medical Device

REF	Catalog number (Order code)
STERILE EO	EOG sterilization
	Single use only. Do not reuse.
	Do not use if package is damaged and consult instructions for use
	Single sterile barrier system
SN	Serial No.
LOT	Batch number
	Date of manufacture
	Use-by date
UDI	Unique Device Identifier
	GS1 DataMatrix for Unique Device Identifier
	Package unit
	Contains hazardous substances
	For indoor use only
	Temperature limitation
	Humidity limitation
	Atmospheric pressure limitation
	Australian RCM Compliance marking for wireless equipment



Keep dry



This is the correct upright position of the distribution packages for transport and/or storage



Fragile/handle with care

1.5 Disposing of products

When your medical device has reached the end of its service life, it must be disposed of via a specialist collection, removal, recycling or destruction channel. Prior to doing so, in order to avoid the health risks to operators handling the disposal of medical equipment, as well as the risks of environmental contamination caused thereof, you need to confirm the equipment is decontaminated.

Therefore contact your nearest NSK dealer, or one of the NSK branches to find out how to proceed.

Refer to the link below:

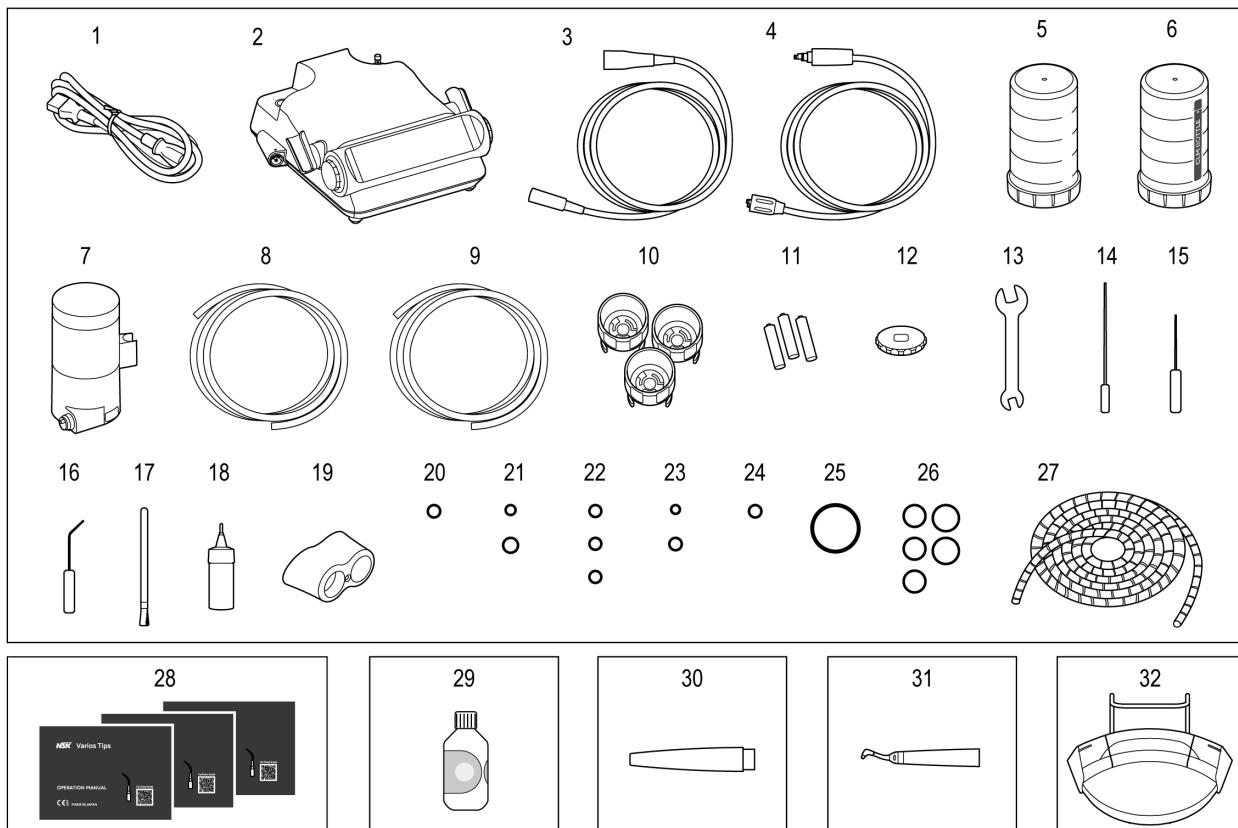


1.6 Warranty

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. Contact an authorized NSK dealer if repairs are necessary.

2 Product Description

2.1 Package contents



No.	Part name	Quantity
1	Power cord	1
2	Control unit	1
3	Ultrasonic handpiece cord	1
4	Handpiece hose (for prophy use)	1
5	Irrigation bottle	1
6	CLM bottle	1
7	Chamber (for prophy use)	1
8	Water hose	1
9	Air hose	1
10	Tip wrench	3
11	AA Alkaline battery 3 Pack	1
12	Ring wrench	1
13	Spanner wrench (12x14)	1
14	Cleaning wire (L)	1
15	Cleaning wire (S)	1
16	Cleaning file	1
17	Cleaning brush	1
18	Lubrication oil	1
19	CLM holder	1
20	O-ring (for handpiece side connector of the ultrasonic handpiece cord)	1

No.	Part name	Quantity
21	O-ring set (for handpiece side connector of the powder handpiece hose)	1
22	O-ring set (for chamber side connector of the powder handpiece hose and chamber)	1
23	O-ring set (for nozzle)	1
24	O-ring (for bottle lid connector of the bottle lid)	1
25	O-ring (for bottle lid)	1
26	O-ring set (for chamber connector)	1
27	Cable cover	1
28	G8	1
	G16	1
	P20	1
29	FLASH pearl (Bottle)	1
30	Ultrasonic handpiece	1
31	Powder handpiece (for prophy use)	1
32	Foot control	1

NOTICE

- FLASH pearl, SOFT pearl and perio mate powder used in powder mode are referred to as "powder" in this operation manual.
- Optional Perio Kit needs to be purchased separately in order to use perio mode. => "9 Spare Parts and Option List"
- Use the chamber, powder, and powder handpiece that are suitable for powder mode. To use powder mode other than those available to your product, purchase the suitable chamber, etc. => "9 Spare Parts and Option List"

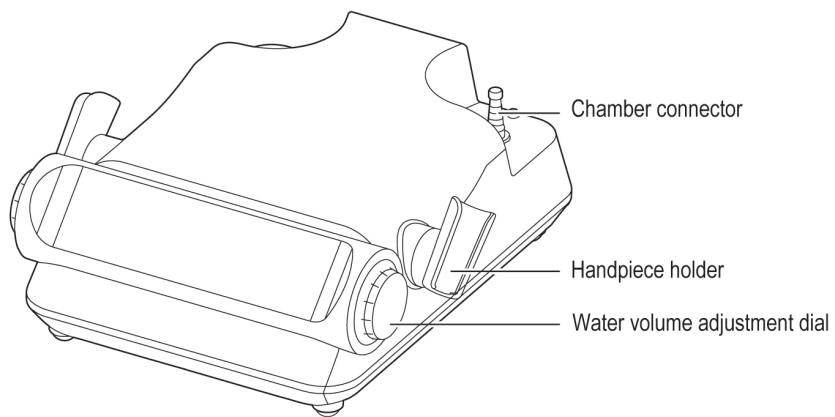
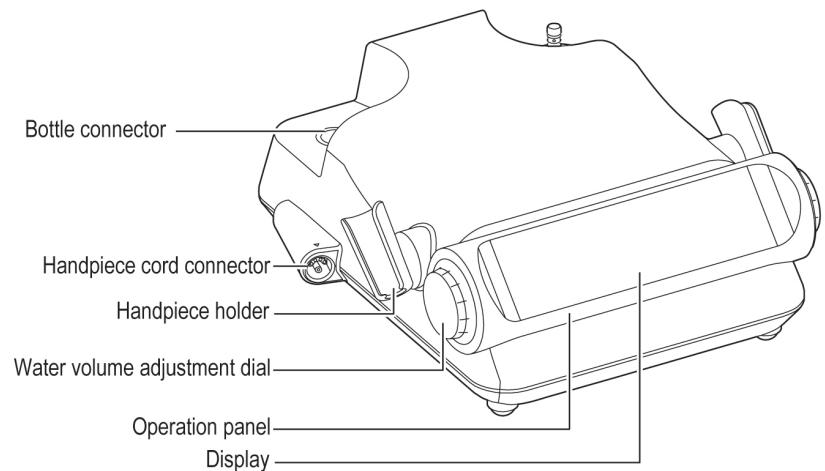
2.2 Applicable products

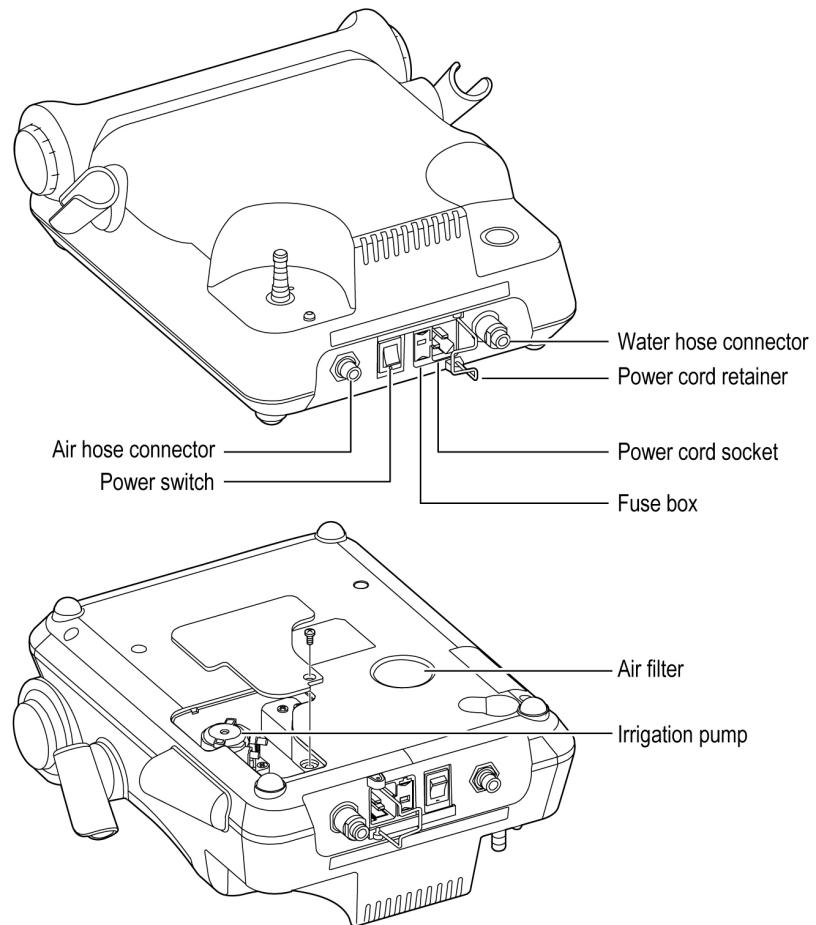
Products that can be used in combination with the device

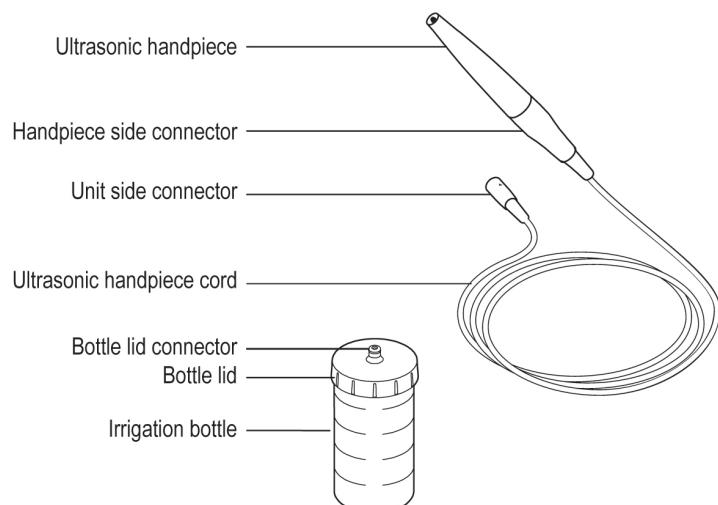
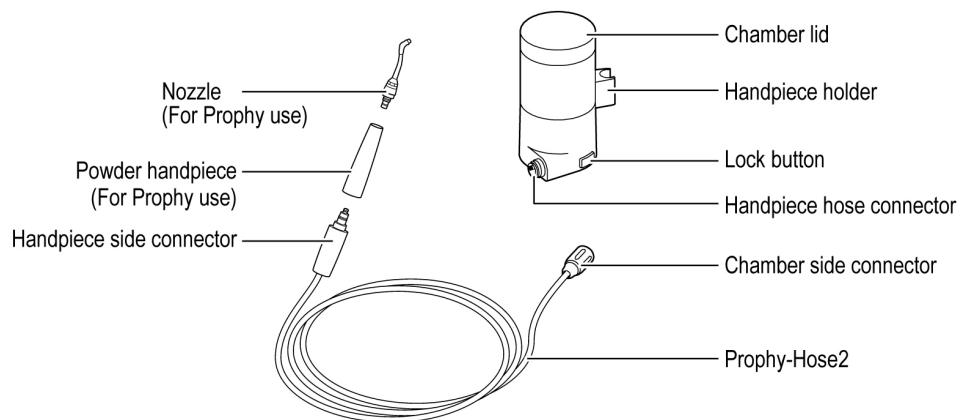
Water Bottle Kit		CLM Module		Prophy Kit2		Perio Kit2	
Powder Handpiece (For Prophy use)	Powder Handpiece (For Perio use)	VA2-LUX-HP Ti	Varios Tip	Perio Mate Nozzle Tip	FC-83		

2.3 Part names

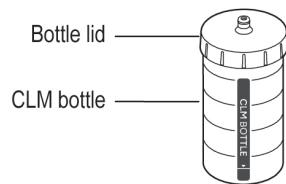
■ Control unit



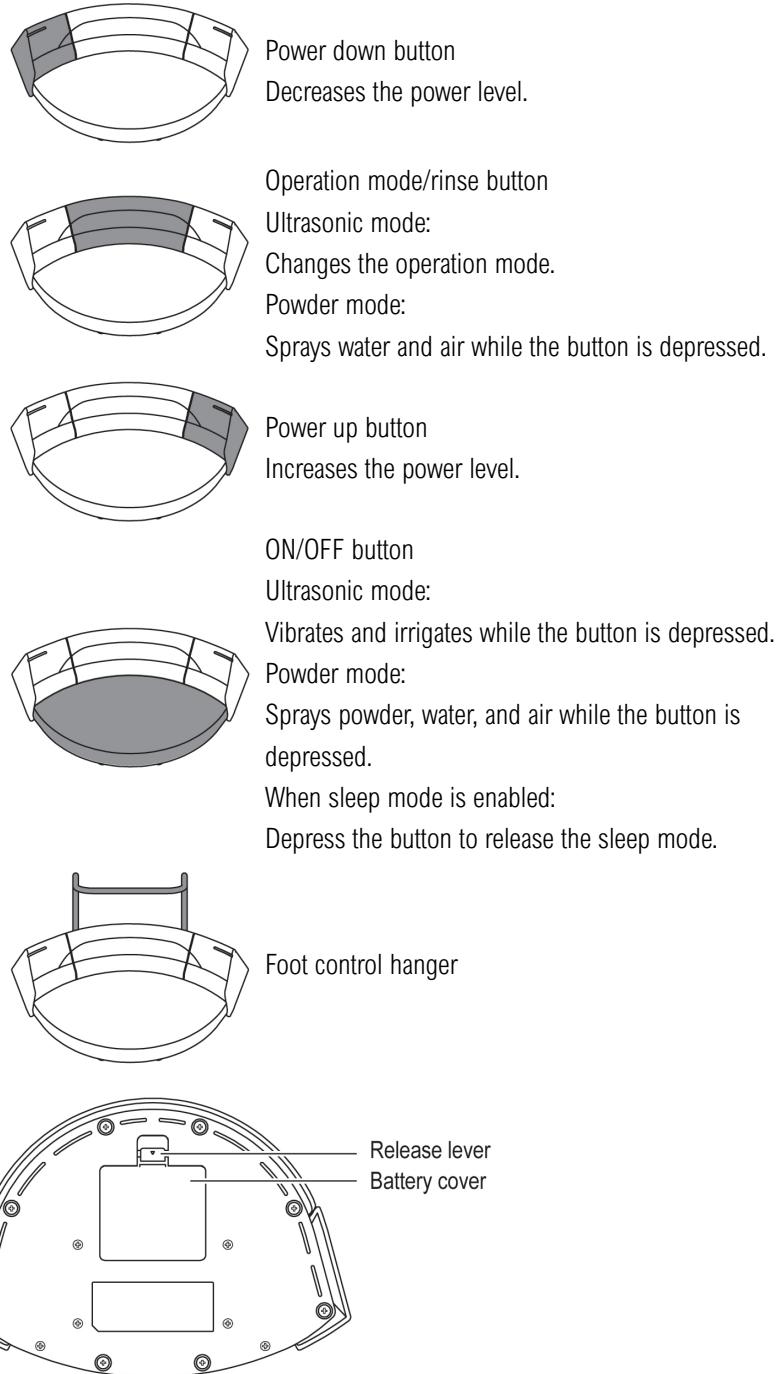


■ Ultrasonic handpiece and irrigation bottle**■ Powder handpiece and chamber**

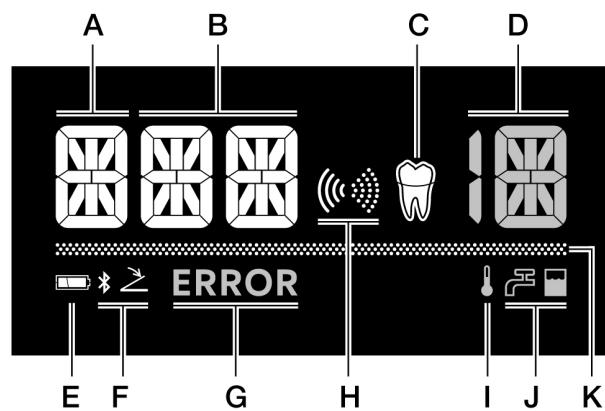
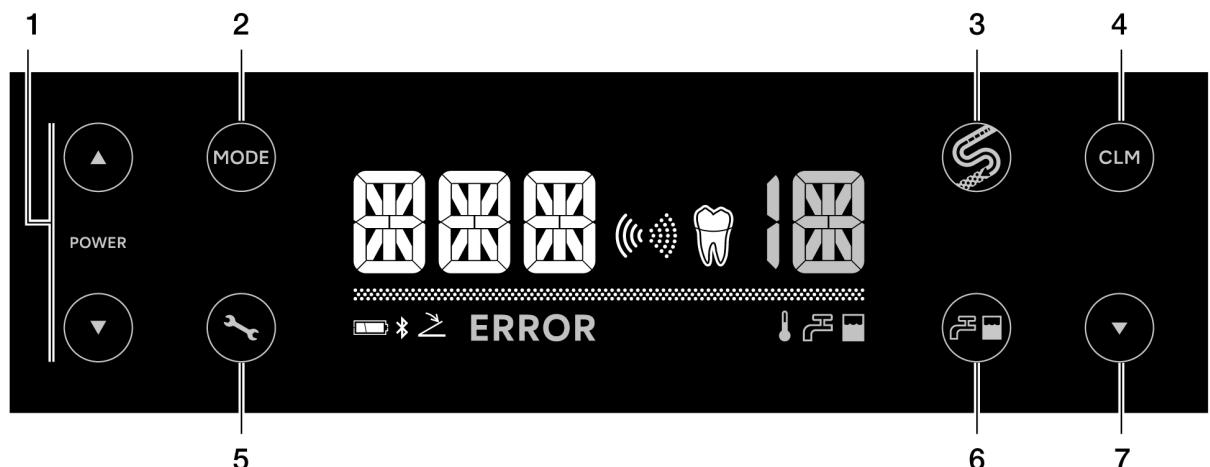
■ CLM bottle



■ Foot control



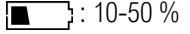
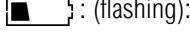
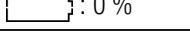
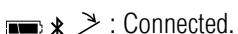
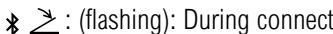
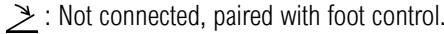
2.4 Operation panel



2 Product Description

<Normal display>

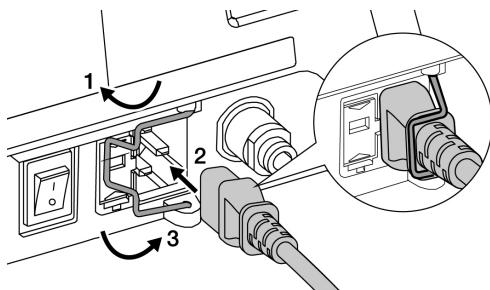
No.	Key	Name	Display	Function
1		Power control key	B	Sets the power level. Touching and holding or increases/decreases the power level continuously.
2		Operation mode select key	H	Switches the operation mode. Touch for three seconds to switch the operation mode: : Ultrasonic mode : Powder mode
			A	When is displayed: Touch to select ultrasonic mode. : General mode High power : Endo mode : Perio mode Low power
			C	When is displayed: Touch to select powder mode. : Prophy mode. Check that the Prophy chamber/Perio chamber with jet nozzle has been installed. : Perio mode. Check that the perio chamber has been installed. : Chamber is not installed.
3		Auto-cleaning key	-	Auto-cleaning "W" or "D": Ultrasonic mode Pre-cleans the inside of the ultrasonic handpiece. => "5.2.1 Ultrasonic"
				Auto-cleaning "W" or "P": Powder mode Pre-cleans the inside of the powder handpiece. => "5.2.2 Powder"
4		CLM key	-	Makes a transition to CLM mode. => "5.10 Decontamination and prevention of biofilm formation of water circuit (twice per week)"
5		Setting key	-	Changes the settings of the control unit and foot control. For information on the setting items and factory default settings, refer to "7 Setting".
6		Tap water/bottle select key	J	Ultrasonic mode: : Irrigates from the irrigation bottle. : Irrigates from tap water. Powder mode: : Irrigates from tap water.
7		Chamber pressure release key	-	Releases the chamber pressure, only for powder mode.

No.	Key	Name	Display	Function
8	-	-	D	<p>Displays the irrigation level.</p> <p>0 OFF</p> <p>1 Minimum</p> <p>10 Maximum</p> 
9	-	-	E	<p>Displays the battery level of the wireless foot control. Check the battery level before and after treatment. Replace the batteries when the battery level display is flashing.</p> <p> : 50-100 %</p> <p> : 10-50 %</p> <p> : (flashing): Less than 10 %</p> <p> : 0 %</p>
10	-	-	F	<p>Status of connection with the foot control</p> <p> : Connected.</p> <p> : (flashing): During connection.</p> <p> : Not connected, paired with foot control.</p> <p>No display: Not connected, not paired with the foot control.</p>
11	-	-	G	<p>Displayed when an error occurs.</p> <p>ERROR and error number are displayed.</p>
12	-	-	I	<p>Displays the "ON"/"OFF" setting status of the heater.</p> <p> : Heater is "ON".</p> <p>No display: Heater is "OFF".</p>
13	-	-	K	<p>Indicates the progress by the length of the bar.</p> <p> : Progress bar</p>

3 Preparation for Use

3.1 Connecting AC power cord

1. Rotate the power cord retainer in the arrow direction.
2. Insert the AC power cord plug.
3. Rotate the power cord retainer in the arrow direction to secure the AC power cord.



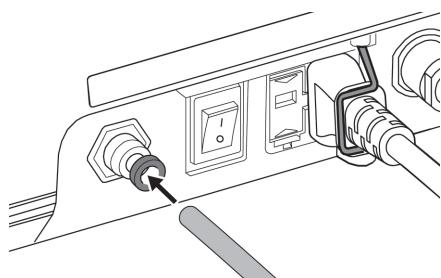
To remove, turn off the power switch, then perform steps 1 to 3 of the connecting procedure in the reverse order.

! PRECAUTIONS

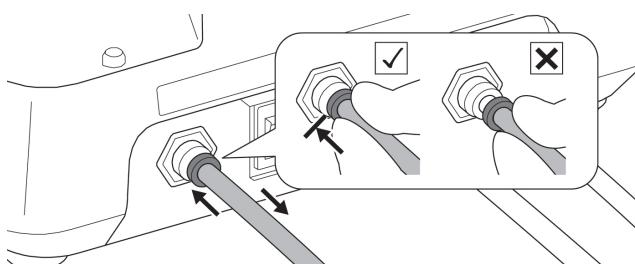
- Be sure to hold the socket to prevent the wire from being broken when disconnecting the AC power cord from the control unit.
- Make sure that the device is completely stopped before connecting or disconnecting the AC power cord.

3.2 Connecting air hose

1. Insert one end of the air hose.
2. Pull the air hose gently and check that it does not come out.



To remove, push and hold the white ring of the air hose connector toward the control unit, and pull out the air hose.

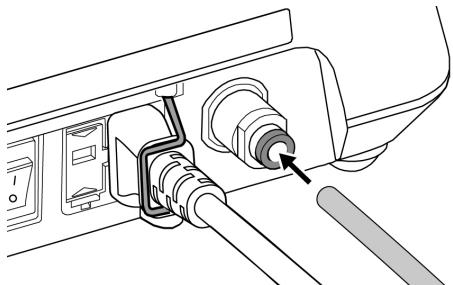


! PRECAUTIONS

- Use clean and dry air. Water or oil content mixed in the air supply may cause clogging with the powder.
- Be sure to connect the air hose to the air hose connector (white ring).

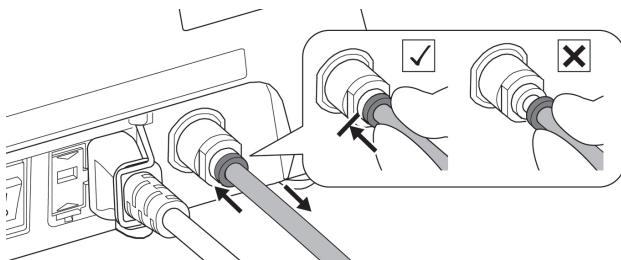
3.3 Connecting water hose

1. Insert one end of the water hose.



2. Insert the other end of the water hose to the water outlet on the dental unit.
3. Pull the water hose gently and check that it does not come out.

To remove, push and hold the green ring of the water hose connector toward the control unit and pull out the water hose.



⚠️ WARNINGS

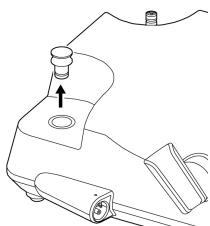
- Use soft water with moderate or less hardness because the use of water with a high degree of hardness may cause mineral or limescale deposits in the water circuit, which can lead to problems such as insufficient water levels, operation problems, or breakdown. In addition, to prevent device breakdown due to the foreign material in tap water, replace the water filter as required. => "6.3 Replacing the water filter"
- Be sure to connect the water hose to the water hose connector with the green ring. If the water hose is connected to the air hose connector with the white ring, water enters the control unit causing a malfunction.

⚠️ PRECAUTIONS

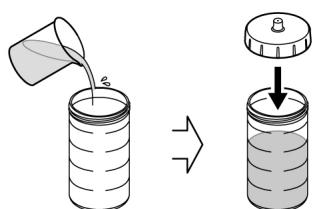
- If the water outlet on the dental unit has not been used for a long time, water may contain rust, etc., when it is run for the first time. Make sure that the water is clean before connecting the water hose.
- Insert the water hose firmly into the water hose connector when connecting it to the control unit. Water may leak if the water hose is not inserted correctly.

3.4 Connecting irrigation bottle

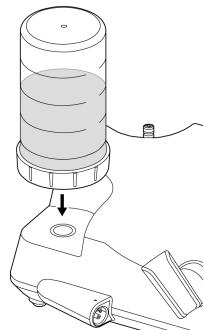
1. Remove the dust cover from the bottle connector.



2. Loosen and remove the bottle lid from the irrigation bottle and fill the irrigation bottle to the desired level with water, then tighten the bottle lid (100 mL per scale).



3. Insert the bottle lid connector straight into the bottle connector.



4. Make sure that there is no gap between the irrigation bottle and the control unit.

To remove, perform step 3 of the connecting procedure in the reverse order.

! PRECAUTIONS

- Insert the irrigation bottle straight. If the bottle is inserted at a tilted angle, this may cause damage to the O-ring.
- Do not put ozone water, electrolyzed-oxidizing water (such as strong acidic water, super acidic water, and electrolyzed water) and hypochlorous solution in the irrigation bottle. They may cause water clogging or metal corrosion.
- Use the irrigation bottle when irrigating from a bottle.
- After using, be sure to clean the irrigation bottle and cap with clean water before storing.
- Be sure to attach the dust cover to the bottle connector when the irrigation bottle is not inserted.
- Do not warm the irrigation bottle and CLM bottle.
- Use the irrigation bottle only for the treatment and maintenance after treatment. => "5 Post-use Maintenance"
- Use the CLM bottle only for the maintenance of the water circuit. => "5.10 Decontamination and prevention of biofilm formation of water circuit (twice per week)"
- Insert the irrigation bottle firmly. If there is a gap between the irrigation bottle and the control unit, water may leak.

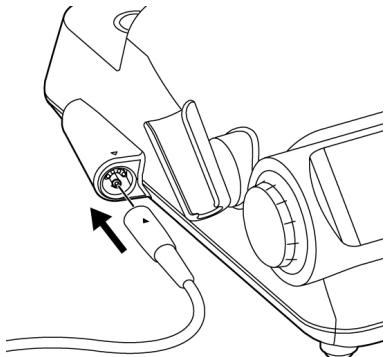
3.5 Connecting ultrasonic handpiece and handpiece cord

⚠ PRECAUTIONS

- Before connecting, make sure that dust or moisture does not adhere to the electrical contacts of the handpiece cord.

3.5.1 Handpiece cord

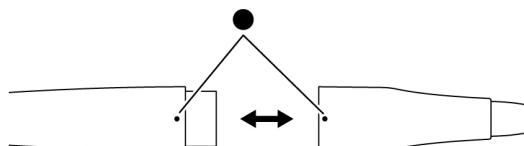
Insert the unit side connector into the handpiece cord connector with the [▲] mark facing up.



To remove, perform the connecting procedure in the reverse order.

3.5.2 Connecting ultrasonic handpiece

- Align the [●] marks on the ultrasonic handpiece and the handpiece side connector with each other, and then push the ultrasonic handpiece straight into the handpiece side connector.
- Insert the ultrasonic handpiece into the handpiece holder.
* Be sure to connect the sterilized ultrasonic handpiece.



To remove, perform step 1 of the connecting procedure in the reverse order.

⚠ WARNINGS

- Never touch the terminal (electrical contacts) of the handpiece cord. Doing so may cause an electric shock.

⚠ PRECAUTIONS

- Before connecting the handpiece to the handpiece cord, check the light guide by pointing the light outlet at the front end of the ultrasonic handpiece toward the light. If the light transmitted to the light guide at the rear of the handpiece is evenly bright, this means the light guide is undamaged working normally. If a part or all is dark, the illumination part may be cracked or broken.
- Do not twist the ultrasonic handpiece or handpiece cord when removing the ultrasonic handpiece. Doing so may damage the handpiece side connector electrical contacts, resulting in malfunction.

3.6 Attaching tip

Refer to the operation manual of the tip listed in "1.2 Related manuals" for the method of mounting and removing.

⚠ WARNINGS

- Be sure to use only NSK genuine tips when using this product.
- The use of non-NSK tips may cause the following faults or unexpected accidents:
 - Inappropriate vibration caused by incompatible threads.
 - Accidental ingestion or aspiration of a broken tip by the patient.
 - Damage or premature wear of the ultrasonic handpiece threads.
- Problems including ultrasonic handpiece damage, failure, and accidents resulted from the use of non-NSK tips are not covered in the warranty.

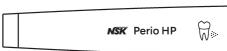
⚠ PRECAUTIONS

- Be careful not to twist the handpiece cord when tightening the tip.
- Pay sufficient attention not to injure yourself during the tip replacement when the distal end of the tip protrudes from the tip wrench.
- Do not use a tip that has been damaged, bent, or rusted. It may break during use.
- Keep the tip and tip wrench straight when rotating the tip wrench. Otherwise, the screw may be bent or the tip may not be tightened adequately causing insufficient vibration.
- If the tip is mounted to the ultrasonic handpiece with dust adhered to the threads, it may result in noise or insufficient vibration. If dust is found on the threads, clean them immediately.
- Do not attempt to sharpen or bend the tip. Doing so may result in the tip breaking, noise, or insufficient vibration during use.
- Be sure to use the supplied tip wrench or E-Tip Wrench to tighten the tip. If the tip is not tightened adequately, insufficient vibration or noise may occur, or the tip may come off, resulting in an accident. Refer to the operation manual of the tip listed in "1.2 Related manuals" for the method of use of the tip wrench/E-tip wrench.
- When attaching a tip, always wear sterile surgical gloves and use a sterilized tip, ultrasonic handpiece, and tip wrench.
- Be sure to remove the tip before connecting or disconnecting the ultrasonic handpiece or the handpiece cord. Failure to do so may cause an injury by the tip.
- If the tip becomes loose, makes noise, or does not vibrate sufficiently even though it was tightened, the tip wrench may have worn out. The tip wrench is a consumable. It should be replaced approximately once a year.

3.7 Connecting powder handpiece and handpiece hose

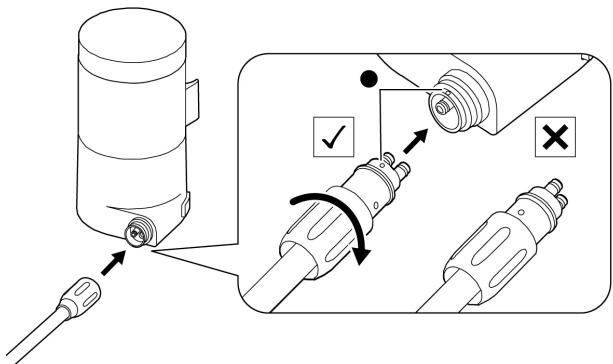
3.7.1 Correct connection and preparation of handpiece hose and chamber

Connect a correct combination of handpiece hose and chamber.

Mode	Powder kit	Nozzle	Handpiece	Handpiece hose
Prophy mode 	For prophy 			
	For perio 			
Perio mode 	For perio 			
				

3.7.2 Connecting handpiece hose

1. Blow dry air to the chamber side connector and the handpiece hose connector to remove moisture.
2. Insert the handpiece hose connector straight into the chamber side connector aligning their [●] marks with each other, and then tighten the nut of the chamber side connector securely.



To remove, perform the step 2 of the connecting procedure in the reverse order.

3.7.3 Connecting powder handpiece

1. Insert the powder handpiece straight into the handpiece side connector.
2. Insert the powder handpiece into the handpiece holder.

* Be sure to connect the sterilized powder handpiece.

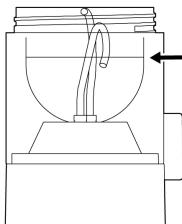


To remove, perform the step 1 of the connecting procedure in the reverse order.

3.8 Filling chamber with powder

For the handling and use methods of the powder, refer to the operation manual of the powder listed in "1.2 Related manuals".

1. Choose the chamber and powder suitable for the mode to be used, and then fill the chamber with the powder to the MAX line (line indicated by arrow) inside the chamber.



2. Tighten the chamber lid securely until it fits the chamber completely.

Mode	Chamber	Powder	Max. filling amount
Prophy mode	For prophy 	FLASH pearl	80 g
		SOFT pearl	50 g
	For perio  Only with jet nozzle	Perio Mate Powder	50 g
Perio mode	For perio 	Perio Mate Powder	50 g

⚠ WARNINGS

- Use only the powder designated by NSK. Using other powders may lead to product failure, damage to the tooth surface, or emphysema. In addition, it may also cause a reduction in performance of the product.

NSK will not accept any liability for failures caused by the use of powders other than those designated.

⚠ PRECAUTIONS

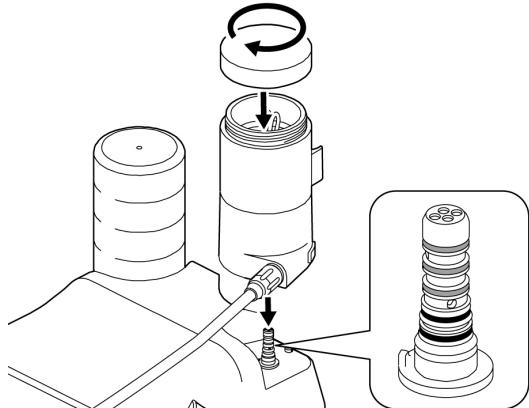
- Securely tighten the chamber lid. Otherwise, the chamber lid may be blown off during use, which may lead to damage to the device or an injury.
- Before inserting the chamber into the control unit, make sure the O-rings of the chamber connector are not damaged or torn. Damaged or torn O-rings could lead to poor operation or malfunction.
- Insert the chamber straight onto the control unit. Inserting at an angle could damage the O-rings, leading to malfunction.
- If too much powder is put into the chamber, the suitable amount of powder may not be injected at the start of use.
- Do not use powder that has been stored in an open package or leftover powder. Using such powder may cause clogging of the nozzle. Do not mix leftover powder with new powder.
- Before inserting the chamber side connector, check the chamber side connector and handpiece hose connector for water, contamination, etc., and wipe it clean if it is wet. Failing to do so may cause powder clogging.
- Do not use expired powder.
- Always securely tighten the powder bottle lid. Failure to do so will attract moisture which may cause clogging.
- If powder adheres to the threads of the chamber and/or the chamber lid, clean it immediately or the chamber lid will become difficult to tighten.
- Do not invert the chamber while it contains powder inside. Inverting the chamber could lead to powder clogging.

⚠ PRECAUTIONS

- As a safety feature, this product does not operate if the foot control is depressed when the chamber is mounted incorrectly. An alarm sounds, and  and  flash alternately. To stop the alarm, mount the chamber correctly.
- The perio mate powder scatters easily because it is made of very fine particles. Fill the chamber slowly to prevent the powder from scattering, and be careful not to inhale the powder or allow it to get into eyes.
- FLASH pearl is almost insoluble in water. To prevent the pipes from being clogged by FLASH pearl, periodically clean and maintain the vacuum hose, saliva ejector, and separator.

3.9 Attaching and removing chamber

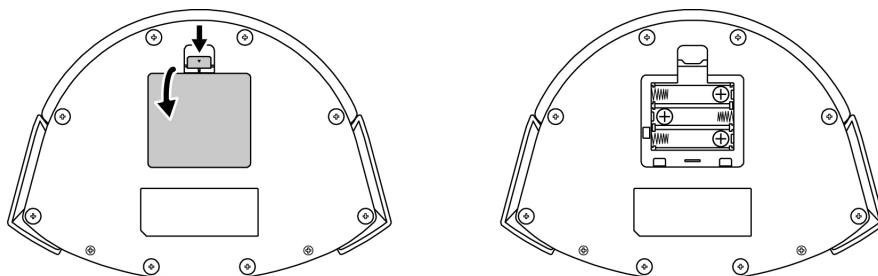
- Tighten the chamber lid to the chamber firmly.
- Insert the chamber straight onto the chamber connector.
- Insert the powder handpiece into the handpiece holder.



To remove, push the lock button, and then pull out the chamber straight.

3.10 Installing foot control batteries

- Slide the release lever in the direction of the arrow, and then remove the battery cover. Insert the AA Alkaline batteries (LR6 AA 1.5 V).



- Attach the battery cover.

To remove the batteries, slide the release lever in the direction of the arrow, and then remove the battery cover then remove the AA Alkaline batteries (LR6 AA 1.5 V).

⚠ WARNINGS

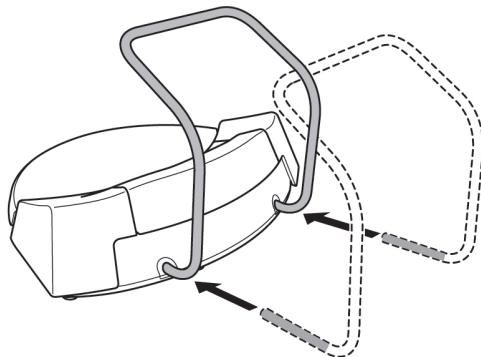
- When replacing batteries during use, keep away from the patient. Touching batteries while contacting the patient may cause electric shock to the operator and patient.

⚠ PRECAUTIONS

- Insert the batteries with the correct orientation by checking the marks on the battery case.
- Use non-rechargeable AA Alkaline batteries (LR6 AA 1.5 V) only. Other batteries may cause a malfunction of the product.
- Do not mix new and old batteries or different types of batteries. Do not use rechargeable batteries. Otherwise, the product may not operate properly or malfunction. If this occurs, contact your authorized NSK dealer.
- When you intend to leave this product without using for a prolonged period, remove the batteries for safety. Failure to do so may cause a malfunction of the product due to battery overheating or leakage.
- Do not allow any impact on the foot control. Doing so may cause the batteries to become detached.

3.11 Installing foot control hanger

1. Squeeze the foot control hanger and insert it aligned with the guides in the foot control hanger holes.
2. Insert in the direction shown by the arrows until the foot control hanger stops.



To remove, perform the installing procedure in the reverse order.

* If the foot control hanger is secure and not easily pulled out, pull each end alternately.

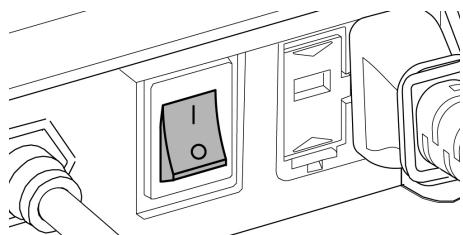
⚠ PRECAUTIONS

- To carry the foot control, be sure to hold the center of the foot control hanger. If you hold the side part of the foot control hanger, it may come out causing the foot control to fall.

3.12 Connecting foot control

■ Connection method

1. Turn on (I side) the power switch.



2. "LOADING" is displayed on the screen and progress bar is displayed repeatedly.



⚠ PRECAUTIONS

- Do not touch the handpiece holder while "LOADING" is displayed. If you touch it, the mounting state of the handpiece may not be recognized correctly. If you accidentally touch it, turn the power switch off and on.

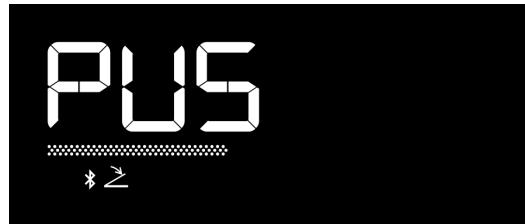
3. There are 2 methods of connection.

In case of sleep mode OFF:



"CONNECT" is displayed, $\ast \geq$ flashes, and the progress bar is displayed repeatedly. The foot control is automatically connected to the control unit.

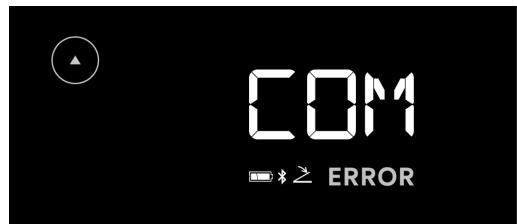
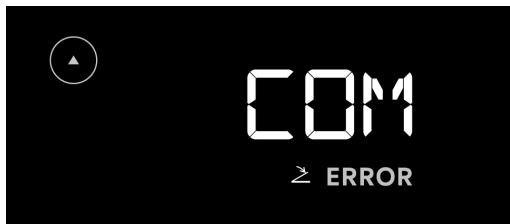
In case of sleep mode ON:



"PUSH FC" is displayed, $\ast \geq$ flashes, and the progress bar is displayed repeatedly. Depressing the ON/OFF button of the foot control once causes the foot control to be automatically connected to the control unit.

* It takes up to 300 seconds to establish the connection.

If the connection is not established, the following error is displayed. => "8.1 Error indication"



3.13 Setting irrigation for ultrasonic mode

When using tap water, make sure that the water hose is firmly connected to the water hose connector of the control unit. For how to connect the water hose, refer to "3.3 Connecting water hose".

Open the water valve of the dental chair unit/Water Bottle Kit and set the water pressure to 0.1-0.3 MPa (1.0-3.0 kgf/cm²).

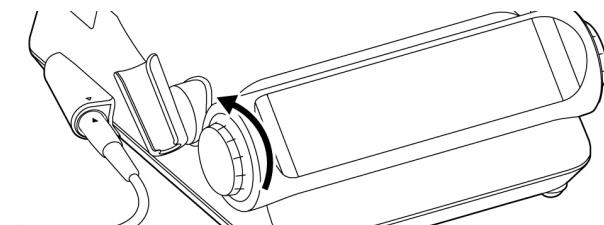
3.13.1 Setting irrigation mode

- Touch **MODE** for three seconds for ultrasonic mode.
- Touch **.tap** to choose the irrigation method (bottle **tap** or tap water **tap**).
- The icon of the mode you selected is displayed on the screen.

3.13.2 Setting irrigation level

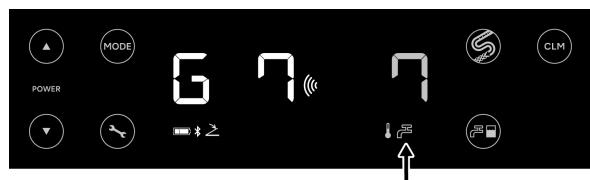
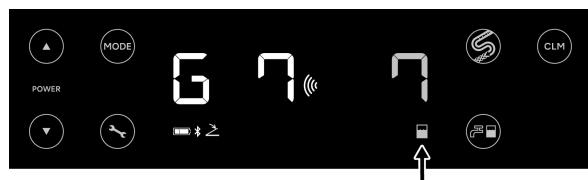
■ When using irrigation bottle/tap water

Rotate the water volume adjustment dial of the irrigation bottle side to adjust the irrigation level. Example:  (0 - 10)



Irrigation bottle

Tap water



* If you accidentally rotate the water volume adjustment dial of the chamber side while in ultrasonic mode, a beep sound will be emitted.

* In the factory setting, the heater is "ON" and lukewarm water will come out (when using tap water only). To turn off the heater, refer to "7 Setting".

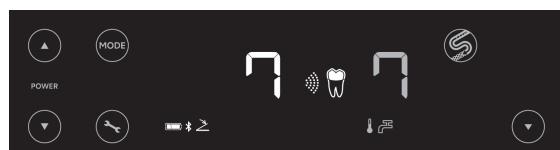
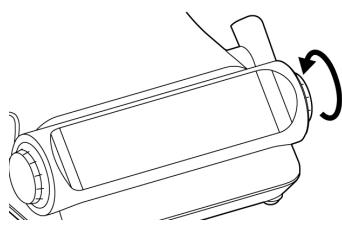
3.14 Setting irrigation for powder mode

Make sure that the water hose is connected to the water hose connector of the control unit. For how to connect the water hose, refer to "3.3 Connecting water hose".

Open the water valve of the dental chair unit/Water Bottle Kit and set the water pressure to 0.1-0.3 MPa (1.0-3.0 kgf/cm²).

3.14.1 Setting irrigation level

Rotate the water volume adjustment dial of the chamber side to adjust the irrigation power level. Example:  (0 - 10)



* If you accidentally rotate the water volume adjustment dial of the irrigation bottle side while in powder mode, a beep sound will be emitted.

* In the factory setting, the heater is "ON" and lukewarm water will come out (when using tap water only). To turn off the heater, refer to "7 Setting".

3.15 Check before treatment

Before use, operate the product without a patient present to confirm there is no abnormal vibration, noise, heat, etc. Also check the following points.

■ **Air hose and water hose:**

Confirm that each hose has no damage.

Turn on the power switch.

■ **Ultrasonic handpiece:**

1. Depress the ON/OFF button of the foot control, and then check that the vibration of the tip, light turns on and irrigation normally comes out of the tip (for 30 seconds).
2. Check that the irrigation temperature is body temperature. If irrigation temperature is high, this may cause malfunction of the control unit. Contact your authorized NSK dealer (when using tap water only).

■ **Powder handpiece:**

1. Depress the operation mode/rinse button of the foot control, and then check that water and air normally come out of the nozzle (for 30 seconds).
2. Depress the ON/OFF button of the foot control, and then check that powder, air, and water normally come out of the nozzle (for 30 seconds).
3. Confirm that the irrigation temperature is body temperature. If water temperature is high, this may cause malfunction of the control unit. Contact your authorized NSK dealer.

■ **General**

Confirm that each connection part is securely connected.

If any abnormality is detected during the check or use, stop operation immediately and contact your authorized NSK dealer.

Because the auto-cleaning drains water from the handpiece cord and hose, no water may come out when you use the control unit next time. If water does not come out 20 seconds or more after you set the irrigation level to the maximum, refer to "8 Troubleshooting".

⚠ PRECAUTIONS

- Touching the display of the control unit may increase the risk of cross-infections. In order to minimize such a risk, it is possible to use a barrier film in combination with Varios Combi Pro2. Do not use a film with poor operability and/or visibility.

4 Operation Procedure

4.1 Ultrasonic mode

⚠ WARNINGS

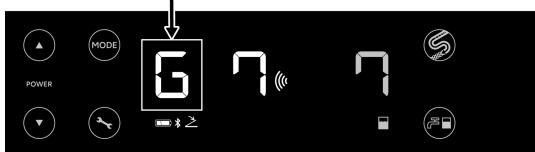
- Do not let the tip come in contact with gingival, mucosa, and/or skin. Doing so may result in injury or burns.

⚠ PRECAUTIONS

- Tips are consumables. The use of a worn tip or a tip that produces noise incurs the following risks:
 - Insufficient vibration and/or damage to the tip.
 - Damage to the tooth surface caused by a variation of the vibration condition.If a tip is worn or produces noise, stop using it and replace it with a new one immediately.
- Do not let the tip come in contact with a prosthesis unless the tip is designed for attaching or removing prostheses (such as a metal crown and porcelain crown). Doing so may cause the prosthesis to come off or be damaged.
- If the vibration of the tip is insufficient during use, remove the handpiece from the patient's mouth, and then re-depress the ON/OFF button of the foot control. If the vibration is still insufficient after that, the tip may have been loosened during use. Check that the tip is firmly mounted.

4.1.1 Setting power level

- Hold the ultrasonic handpiece.
- Touch **MODE** to select ultrasonic mode.
Example: **G** (P, E or S)
- Set the power level using **▲** / **▼**. The power level display increases or decreases in accordance with the selected power level.



⚠ PRECAUTIONS

- If the allowable maximum power level for the tip is exceeded, the tip may produce noise, be broken, or damage the tooth surface. Be sure to keep the power level below the allowable maximum power level specified in tips operation manuals listed in "1.2 Related manuals".

NOTICE

- Touch and hold the power control key to increase or decrease the power level continuously. An alarm sounds when the maximum or minimum level is reached.
- To irrigate without vibrating the tip, set the power level to "0 (zero)" and the irrigation level to 1 or more.

NOTICE

- When using tap water, rotate the water volume adjustment dial to adjust the water volume.

4.1.2 Operation

- Depress the ON/OFF button of the foot control to operate the product.
A "beep" sounds, the tip starts vibrating, and the ultrasonic handpiece LED lights up.
Adjust the irrigation level in accordance with the tip you are using.
- Release the foot from the ON/OFF button of the foot control.
The tip vibration and irrigation are stopped, and the LED turns off.

⚠ PRECAUTIONS

- As a safety feature, this product does not operate when the power switch is turned on while the ON/OFF button of the foot control is depressed. In this case, an alarm sounds and the ultrasonic mode display (PEG) and (flash alternately. To stop the alarm, release the ON/OFF button of the foot control.
- Always use irrigation. If the irrigation level is insufficient, the ultrasonic handpiece will overheat and may injure the surface of the patient's tooth.
- Check that clean water is sprayed adequately before use.
- Water may not be sprayed smoothly if the irrigation level is set to a low level. In this case, temporarily increase the irrigation level and depress the ON/OFF button of the foot control to check that water is sprayed smoothly from the tip. After that, adjust the irrigation level again to achieve appropriate volume.
- Do not forcibly rotate the handpiece holder or apply excessive load to it. Doing so may cause damage or deformation.

NOTICE

- The ultrasonic handpiece LED stays lit for about five seconds after the foot control is released (afterglow function).
- The ultrasonic mode (PEG), power level, irrigation mode settings, irrigation level, and water temperature level are stored after the power is turned off and the same settings are applied when the power is turned on next time (last memory function).
- A working sound may be emitted, but this does not indicate a malfunction.
- If the foot control is continuously depressed for ten minutes, the product stops operating and an alarm sounds. At the same time, the ultrasonic mode display (PEG) and (flash alternately. To stop the alarm, release the foot control.

4 Operation Procedure

About supplied tips

G8



This tip is suitable for removing supragingival calculus and interdental calculus. It is suitable for removing stubborn calculus from any surface.



Touch the tooth surface with the tip side in parallel, without poking at the tooth surface with the distal end of the tip, and then move the tip finely.

G16



This tip is suitable for removing supragingival calculus and subgingival calculus.



Insert the distal end of the tip into the pocket along the tooth surface, and then move the tip slowly. The distal end of the tip has a sharp shape, enabling to access a narrow interdental space easily.

P20



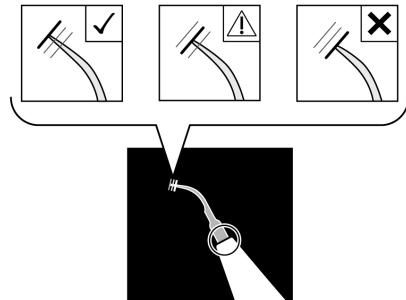
This tip is suitable for maintenance and finishing because its cross-section is round to avoid damaging the tooth surface.



Insert the distal end of the tip into the pocket along the tooth surface, and then move the tip slowly.

■ How to use tip card

To see whether or not a tip should be replaced, measure the length of its distal end by fitting it into the corresponding tip illustration on the tip card. To guarantee safe and effective use with appropriate vibration, it is recommended that a tip be replaced if it meets the yellow line (1 mm of wear).



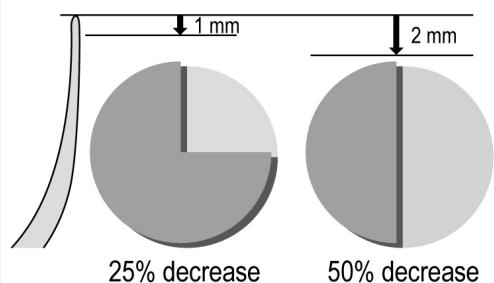
Green: No wear (The tip is OK. Tip replacement is not necessary.)

Yellow: Wear of 1 mm (The tip is showing some wear. Tip replacement is recommended.)

Red: Wear of 2 mm (The tip has been worn badly and must be replaced.)

▲ PRECAUTIONS

- Tips are consumables. The efficiency of dental scaling decreases approximately 25 % when the top of the tip has been worn by 1 mm and approximately 50 % when it has been worn by 2 mm. In addition, the vibration condition changes owing to the wear, which may damage a patient's tooth surface. Periodically check the tip wear condition using the tip card, and replace the tip with a new one in good time.

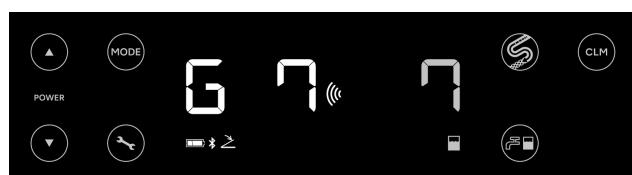


■ About operations available when ultrasonic handpiece is operating

During operation, only the power level and irrigation level can be adjusted.

4.1.3 About protection circuit

This product may overheat internally if used at power level 8 or higher in G mode for an extended amount of time. In this case, the protection circuit automatically reduces the power level to 7 and the progress bar flashes alternately. When the protection circuit is activated, the power level does not automatically increase for safety.



NOTICE

- The power level cannot be increased to 8 or higher when the protection circuit is active (when the progress bar flashes alternately).
- Although the power level indicator temporarily stops flashing when the power level is reduced below 7, it starts flashing again if the power level is increased to 7 while the protection circuit is active.

4.2 Powder mode

The available modes vary depending on the product you purchased.

If you purchased Varios Combi Pro2 Basic Set and want to use perio mode: Purchase the Varios Combi Pro2 Perio Kit2.
=> "9 Spare Parts and Option List"

⚠ WARNINGS

- Be sure to attach the chamber suitable for the mode you require beforehand.
- Never spray powder toward the body of the patient, operator, or assistant other than the patient's tooth surface.
- Stop use immediately if the handpiece hose swells or air or powder leaks from connections between the chamber and handpiece hose during use.
- Always use irrigation.
- Be sure to use a vacuum tube (and a saliva discharge tube together if necessary) to prevent the patient from ingesting a large amount of powder. Avoid continuous use over long periods and allow the patient to rinse out the mouth whenever necessary.

⚠ PRECAUTIONS

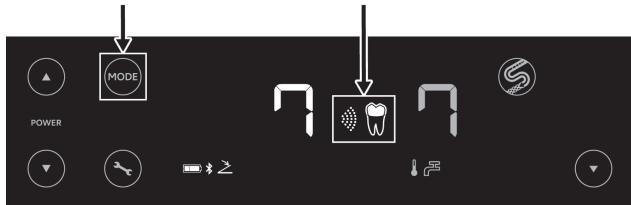
- As a safety feature, this product will not operate when the power switch is turned on while the ON/OFF button of the foot control is depressed. An alarm sounds and the  icon and  flash alternately. To stop the alarm, release the ON/OFF button of the foot control and depress it again.
- Adjust the power level and the irrigation level before putting the tip into the patient's mouth and starting the treatment.
- Start from low power level when treating around marginal gingiva.
- Maintain the distance between the distal end of the nozzle of the powder handpiece and the tooth surface as specified in "4.2.3.1 Using in proph mode" and "4.2.3.2 Using in perio mode".
- Do not forcibly rotate the handpiece holder or apply excessive load to it. Doing so may result in damage and/or deformation.

NOTICE

- A buzzing sound may be emitted, but this does not indicate a malfunction.
- If the foot control is continuously depressed for ten minutes, the product stops operating, an alarm sounds, and the  and  flash alternately. To stop the alarm, release the ON/OFF button of the foot control and depress it again.
- If chamber is not attached when the power switch is turned on, error ( and "- -") is displayed. Securely attach the chamber before power switch is turned on.

4.2.1 Selecting powder mode

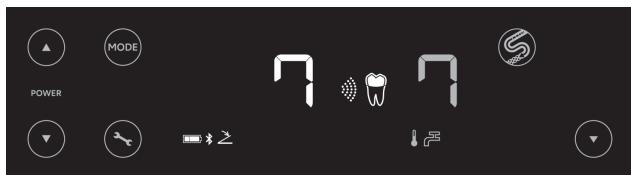
1. Touch **MODE** for three seconds to select powder mode.
2. Attach the chamber suitable for the mode to be used and touch **MODE** to select the mode.



Mode	Powder kit	Handpiece	Nozzle	Use	Powder
Prophy mode 	For prophy 				
	For prophy 				
	For perio 				
Perio mode 	For perio 				

4.2.2 Setting power level

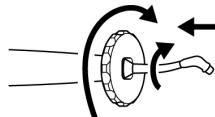
Set the power level using / . The power level display increases or decreases in accordance with the selected power level.



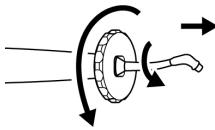
4.2.3 Operation

■ Attaching nozzle

1. Attach the nozzle to the powder handpiece.
2. Use a ring wrench to turn the nozzle in the direction of the arrow to secure it firmly.



To remove, perform the attaching procedure in the reverse order.

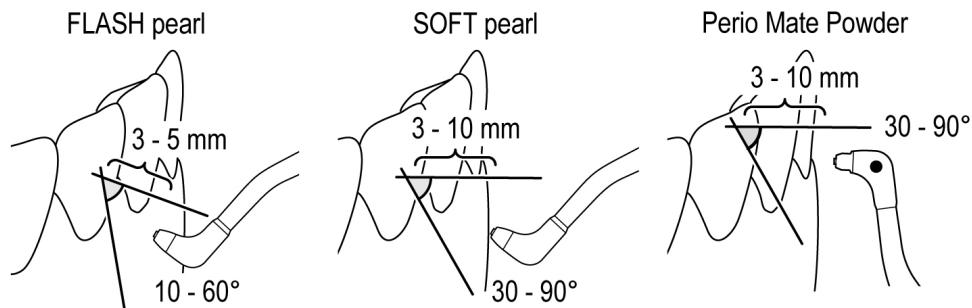


⚠ WARNINGS

- Be sure to use the supplied ring wrench to attach and remove nozzles. When attaching or removing a nozzle, do not hold its distal end. Doing so may deform the nozzle.

4.2.3.1 Using in prophy mode

1. Use the nozzle while keeping the distance and angle from the tooth surface as shown in the figure.
2. Depress the ON/OFF button of the foot control to operate the product.



⚠ WARNINGS

- Never point toward soft tissue, gum, or the subgingival area.

⚠ PRECAUTIONS

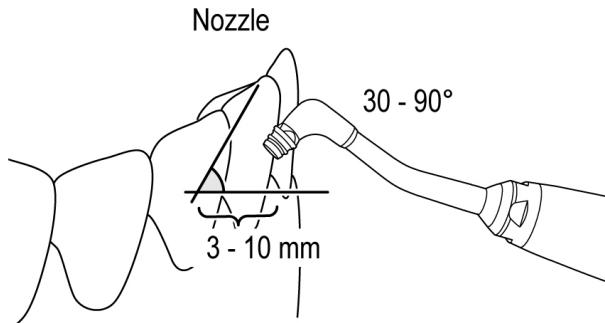
- Spray from the root to the incisal edge of the tooth.

4.2.3.2 Using in perio mode

■ Using nozzle

To remove plaque, biofilm, and light stains on the supragingival area and gingival margin, use the product without the nozzle tip attached to the nozzle of the powder handpiece.

1. Use the nozzle while keeping the distance and angle from the tooth surface as shown in the figure.

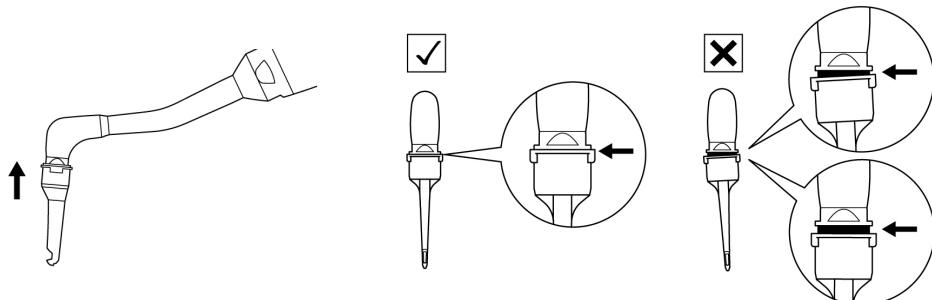


2. Depress the ON/OFF button of the foot control to operate the product.

■ Using nozzle tip

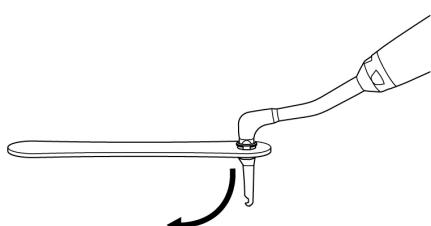
[Attaching the nozzle tip]

Attach the nozzle tip securely and firmly to the nozzle.



To remove, use the nozzle tip remover to remove the nozzle tip.

Dispose of the used nozzle tip.



⚠️ WARNINGS

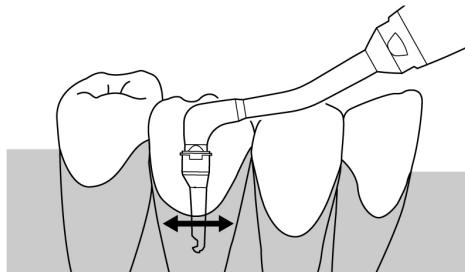
- Do not use a deformed or damaged nozzle tip. It may detach during use.
- A perio mate nozzle tip is for single use only. Do not reuse or re-sterilize it as product breakage or infection could occur. If the nozzle tip is reused, it may not operate correctly due to deformation produced during removal, or it may be detached during use resulting in accidental ingestion by the patient. Also do not reuse a tip that has been accidentally removed.

⚠ PRECAUTIONS

- Be sure to attach the nozzle tip securely and firmly. If the tip is attached incorrectly, it will come off and may be accidentally ingested by the patient.
- When attaching a nozzle tip to the powder handpiece, always wear sterile surgical gloves and make sure that the powder handpiece is sterilized.

[Using nozzle tip]

1. Insert the nozzle tip deeper than 3 mm into the periodontal pocket.
Powder may not be sprayed efficiently into the periodontal pocket if the depth is less than 3 mm.
2. Depress the ON/OFF button of the foot control to operate the product.



⚠ WARNINGS

- When using without the nozzle tip, never point toward the oral mucous membrane.
- Do not use this product in a subgingival root face just after scaling on it. Doing so may cause bacteremia.
- Do not insert the nozzle tip more than once into the same periodontal pocket during the same treatment.
- Powder can be sprayed for a maximum of 5 seconds in the same periodontal pocket (maximum 20 seconds for one tooth). Never spray powder for longer than the specified time.
- Do not force the nozzle tip into a periodontal pocket.
- Do not spray powder while the nozzle tip end is located at the bottom of a periodontal pocket. Doing so may cause emphysema.
- Use the nozzle tip only in periodontal pockets.
- Setting the power level too high may cause emphysema. Adjust the power level to an adequate level while observing the patient's condition.

NOTICE

- The alarm sounds every five seconds when using in perio mode.
- In perio mode, the power level is automatically reduced to a weaker level compared to the same power setting for prophy mode.

■ About operations available when powder handpiece is operating

During operation, only the power level and irrigation level can be adjusted.

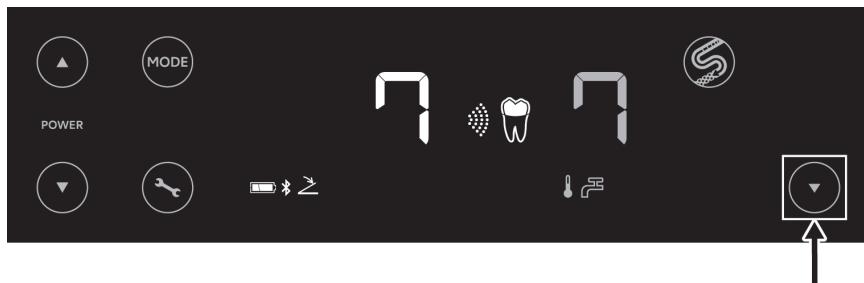
4.2.3.3 Releasing residual pressure

! PRECAUTIONS

- The chamber lid becomes hard to open after operation due to the air pressure built up in the chamber during operation. Release the pressure remaining in the chamber before refilling the chamber with powder or removing the chamber from the control unit.

* The powder and water remaining in the handpiece hose come out of the powder handpiece head during the release of the residual pressure. Prepare a container such as a cup to catch the powder and water.

- Take the powder handpiece out of the handpiece holder.
- Place the powder handpiece head into the container to catch powder and water.
- Touch and hold  for about 3 seconds. Beeps sound, and the residual pressure starts to be released.



- The operation automatically stops when all the residual pressure is released from the chamber.

NOTICE

- The power level and irrigation mode settings are stored after the power is turned off and the same settings are applied when the power is turned on next time (last memory function).

4.3 Sleep mode

When the control unit is turned on and the foot control is left alone without operations for a certain period of time, sleep mode is activated to save the battery of the foot control.

- Sleep mode is enabled when the setting value is ON.
- Sleep mode is disabled when the setting value is OFF, and the battery of the foot control continues to be consumed even when there are no operations.

For setting and release of the sleep mode details, refer to "7.3.7 Setting sleep mode of the foot control".

NOTICE

- Sleep mode is activated sooner than usual when auto-cleaning or CLM mode is performed and the sleep mode is ON.

5 Post-use Maintenance

Perform the following maintenance after use on each patient.

The following reprocessing instructions are created on the basis of the requirements of ISO 17664.

The effectiveness of the reprocessing through the following procedure has been verified.

⚠ WARNINGS

- For cleaning and disinfection, use disinfectant ethanol or disinfectant isopropanol that does not contain any additives (any quaternary ammonium salts). Use of other disinfectants may cause discoloration or cracking.
 - * For details, contact the manufacturer of the disinfectant.
 - * In this operation manual, disinfectant ethanol or disinfectant isopropanol that does not contain any additives (any quaternary ammonium salts) is called "disinfectant alcohol".
- Use appropriate disinfectant alcohol according to the regulations and guidelines of each country.
- Always obey the local directives, standards, guidelines, etc., as to the cleaning, disinfection, and sterilization of the product.
- Wear eye protection, protective mask, and gloves for safety and infection prevention before starting maintenance.
- Use only the cleaning and disinfection agent products specified in this operation manual.
- For reprocessing the tip, tip wrench, and E tip wrench, refer to the OM-Z0288E/OM-Z0314E OPERATION MANUAL listed in "1.2 Related manuals".
- Do not use solvents such as electrolyzed-oxidizing water (strong acidic water or super acidic water), strong acidic or alkaline chemical, chlorine-containing solvent, benzine and thinner when cleaning, immersing, or wiping.
- Failure to properly maintain the products may cause infection, product failure, or overheating and injuries.
 - Be sure to clean and disinfect the products immediately (within 30 minutes) after use to remove residue.
- After the washer-disinfection, take the product out of the washer-disinfector immediately (within an hour). Failure to do so causes corrosion.
- Use clean and dry compressed air for cleaning.
- Before the disinfection, be sure to clean the product to remove any residues. If blood remains in the product, it coagulates causing a malfunction of the product.
- After the washer-disinfection, dry the product completely. Remaining moisture causes internal corrosion.

⚠ WARNINGS

- The product lifetime and products ability to operate correctly are mainly determined by mechanical stresses during use and the chemical influences due to processing. If you detect any abnormality such as abnormal vibration or action, heat generation, vibration or noise, or if the exterior markings (serial number or model number) have become unreadable before or during use, stop using the product immediately and request your nearest NSK dealer, or one of the NSK branches for a periodic inspection*.

Disappearance of exterior markings is not covered under warranty for repair.

When the product has been reprocessed 250 times or has been in use for one year, it is recommended that a periodic inspection be performed by an authorized NSK service*.

* Refer to the link below:



⚠ PRECAUTIONS

- The following products require reprocessing after each patient treatment: control unit, foot control, chamber, irrigation bottle, ultrasonic handpiece, handpiece cord, powder handpiece, handpiece hose, tip, tip wrench, and E tip wrench.
- Do not twist or bundle the ultrasonic handpiece/powder handpiece and handpiece cord/handpiece hose. It may cause damage to the connection parts, failure, and loss of cleaning effect.

5.1 Preparation

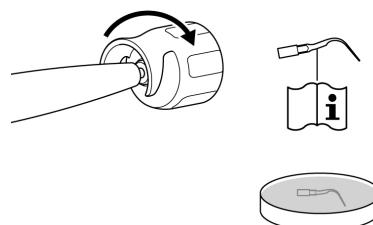
5.1.1 Ultrasonic

- Wear eye protection, a mask, and gloves to prevent infection.
- Turn off the power switch of the control unit.



5.1.2 Preparation for auto-cleaning

- Remove the tip from the ultrasonic handpiece using the tip wrench or the E-tip wrench.
- Remove the tip from the tip wrench (only when using tip wrench).

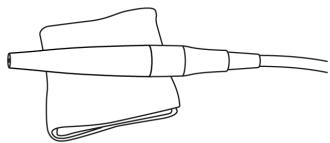


⚠ PRECAUTIONS

- For how to reprocess tips and the tip wrench, refer to the OM-Z0288E/OM-Z0314E OPERATION MANUAL listed in "1.2 Related manuals".

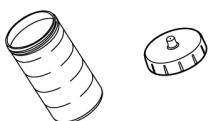
5 Post-use Maintenance

3. Wipe off soil from the ultrasonic handpiece surface using a lint-free cloth dampened with water.



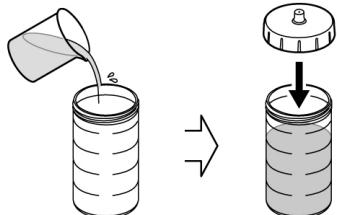
4. Remove the irrigation bottle, and then clean the inside of the irrigation bottle and the bottle lid with running water.

$\geq 30\text{ s}$ $\leq 38\text{ }^{\circ}\text{C}$ $\geq 3.5\text{ L/min}$

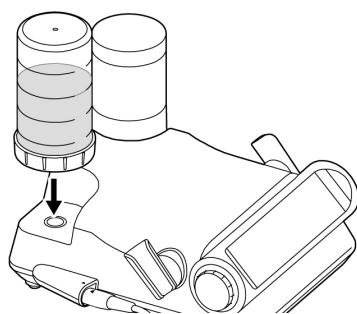


* When using tap water, open the water valve of the dental unit.

5. Fill the irrigation bottle to the half or more with distilled water or purified water, and then tighten the bottle lid securely. (Do not use saline solution.)



6. Insert the irrigation bottle straight into the bottle connector.



* If there is a gap between the irrigation bottle and the control unit, water may leak.

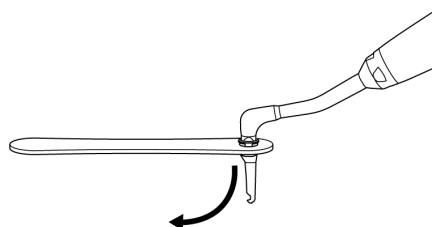
5.1.3 Powder

NOTICE

- To prevent powder from clogging the pipes, perform periodical cleaning and maintenance of the vacuum hose, saliva ejector, and separator.

5.1.4 Preparation for auto-cleaning

1. Remove the nozzle tip using the nozzle tip remover (when using perio mate nozzle tip).



2. Wipe off soil from the powder handpiece surface using a lint-free cloth dampened with water.



⚠ WARNINGS

- A perio mate nozzle tip is for single use only. Do not reuse or re-sterilize it as product breakage or infection could occur.
- Dispose of used perio mate nozzle tips as medical waste.

5.2 Auto-cleaning

Perform auto-cleaning after use on each patient.

	Frequency of performing auto-cleaning modes	Actual Use of Varios Combi Pro2		
		Ultrasonic & Powder	Powder only	Ultrasonic only
Auto-cleaning mode to be activated	After each treatment	W (powder)	W (powder)	-
	Once per day (after final treatment)	D	P	W (ultrasonic)

Description of auto-cleaning modes:

W: Ultrasonic

Removal of **Water** from ultrasonic handpiece cord

W: Powder

Removal of **Water** from powder handpiece hose

Purging powder from powder handpiece hose

D: **Dual** mode

Removal of water from powder handpiece hose and ultrasonic handpiece cord

Removal of powder from powder circuit (powder handpiece hose and chamber)

Releasing residual pressure from chamber

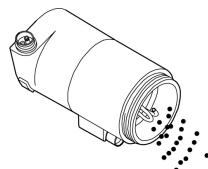
P: Removal of **Water** from powder handpiece hose

Removal of **Powder** from powder circuit (powder handpiece hose and chamber)

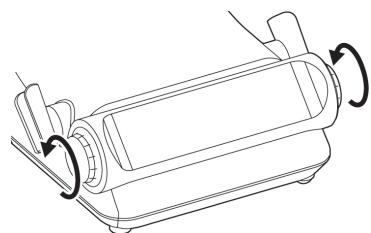
Releasing residual pressure from chamber

NOTICE

- Before activating D or P Auto-cleaning mode, make sure to remove remaining powder from the chamber.



- Rotate the water volume adjustment dial to set the irrigation level to 10.



⚠ PRECAUTIONS

- Be sure to check the handpiece cord or handpiece hose is not damaged or twisted before starting auto-cleaning.
- During auto-cleaning, water used for cleaning comes out of the ultrasonic handpiece head and/or powder handpiece head. Prepare a container such as a cup to catch the water.
- Before starting auto-cleaning, rotate the water volume adjustment dial to set the irrigation level to 10.
- Make sure that the ultrasonic handpiece and handpiece cord, powder handpiece and handpiece cord are securely connected.
- "Auto-cleaning" has no cleaning effect. This function is used for auto-purge of the water and air.

5.2.1 Ultrasonic

⚠ PRECAUTIONS

- Be sure to perform auto-cleaning (draining water from the ultrasonic handpiece irrigation path) after use on each patient. If the auto-cleaning is omitted, the irrigation path may be clogged or metal parts may be rusted.
- Be sure to put distilled water or purified water without impurities into the irrigation bottle. The use of dirty water causes clogging of the irrigation tube or other problems.
- After removing the irrigation bottle, dispose of the liquid in it immediately. If liquid remains in the irrigation bottle, it may cause liquid to leak from the bottle lid connector of the irrigation bottle.

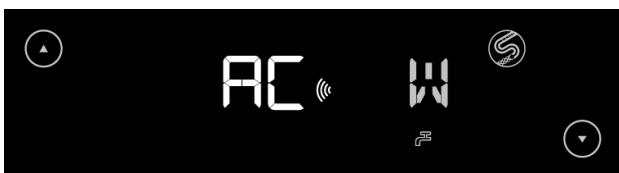
NOTICE

- The ultrasonic handpiece LED does not turn on during auto-cleaning.

1. Point the ultrasonic handpiece head towards the spittoon or sink.
2. Before activating D Auto-cleaning mode, make sure to remove remaining powder from the chamber.
3. Touch  for three seconds.
4. Touch .
5. Select "W" (irrigation circuit) or "D" (irrigation circuit and powder circuit).

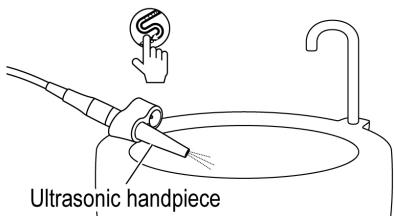
■ Auto-cleaning "W" (cleaning the irrigation circuit)

- 1) Select "W".



- 2) Insert the ultrasonic handpiece with cord into the CLM holder, then lay it on a spittoon or sink.

- 3) Touch .



- 4) During the cleaning, the following display is shown.



Progress status can be checked with the decrease of progress bar.

* To cancel auto-cleaning, touch  again.

- 5) When auto-cleaning is completed, "Fin" is shown on the display.



- 6) Touch  to return to the screen before cleaning.

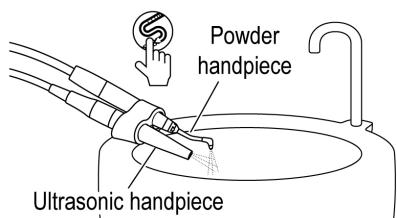
5 Post-use Maintenance

- Auto-cleaning "D" (cleaning all irrigation and air circuits)

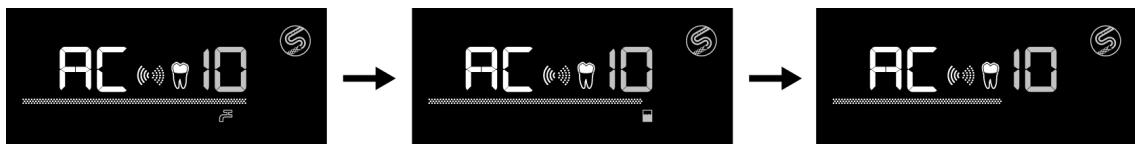
- 1) Select "D".



- 2) Insert the ultrasonic handpiece with cord and powder handpiece with hose into the CLM holder, then lay it on a spittoon or sink.
- 3) Touch .



- 4) During the cleaning, the following display is shown.



Progress status can be checked with the decrease of progress bar.

* To cancel auto-cleaning, touch  again.

- 5) When auto-cleaning is completed, "Fin" is shown on the display.

Fin

- 6) Touch  to return to the screen before cleaning.

PRECAUTIONS

- For how to reprocess ultrasonic handpiece, refer to the OM-DE0981MA OPERATION MANUAL listed in "1.2 Related manuals".

5.2.2 Powder

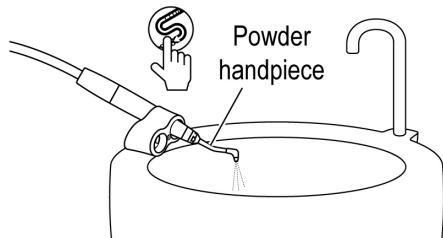
! PRECAUTIONS

- Be sure to perform auto-cleaning (draining water from the powder handpiece irrigation path and draining powder from the powder circuit) after use on each patient. If auto-cleaning is omitted, the irrigation path may be clogged or metal parts may be rusted.

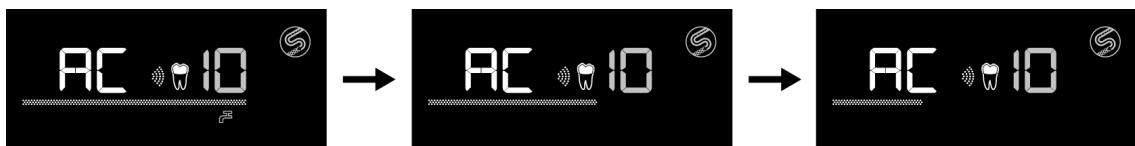
- Point the powder handpiece head towards the spittoon or sink.
- Touch  for three seconds.
- Touch .
- Select "W" (irrigation circuit) or "P" (irrigation circuit and powder circuit).
- Auto-cleaning "W" (cleaning the irrigation circuit)
 - Set the circuit of the cleaning to "W".



- Insert the powder handpiece with cord into the CLM holder, then lay it on a spittoon or sink.
- Touch .



- During the cleaning, the following display is shown.



Progress status can be checked with the decrease of progress bar.

* To cancel auto-cleaning, touch  again.

- When auto-cleaning is completed, "Fin" is shown on the display.



- Touch  to return to the screen before cleaning.

5 Post-use Maintenance

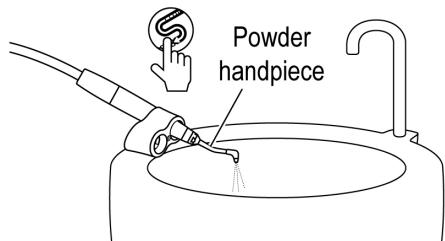
- Auto-cleaning "P" (cleaning the irrigation circuit and powder circuit)

- 1) Select "P".

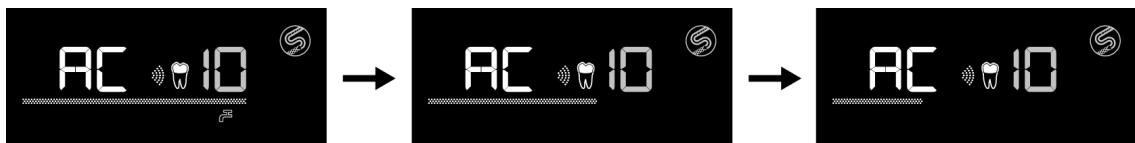


- 2) Insert the powder handpiece with cord into the CLM holder, then lay it on a spittoon or sink.

- 3) Touch



- 4) During the cleaning, the following display is shown.



Progress status can be checked with the decrease of progress bar.

* To cancel auto-cleaning, touch again.

- 5) When auto-cleaning is completed, "Fin" is shown on the display.



- 6) Touch to return to the screen before cleaning.

PRECAUTIONS

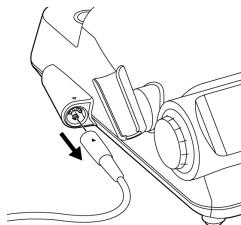
- For how to reprocess ultrasonic handpiece, refer to the OM-DE0981MA OPERATION MANUAL listed in "1.2 Related manuals".

5.3 Cleaning and disinfection of the ultrasonic side

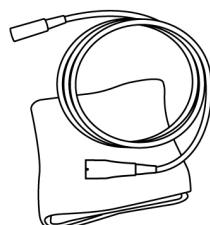
5.3.1 Handpiece cord

■ Cleaning and disinfection

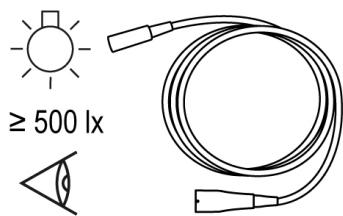
1. Disconnect the handpiece cord from the control unit.



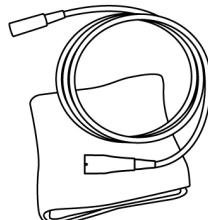
2. Wipe the soil off the handpiece cord surface using a lint-free cloth dampened with water.



3. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from step 2 until it is removed.

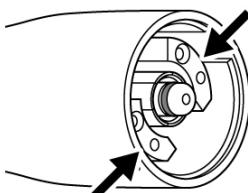


4. Wipe the handpiece cord surface using a lint-free cloth dampened with disinfectant alcohol.



5. Wipe the connection part of the handpiece side connector using a cotton swab dampened with disinfectant alcohol.

If a cotton swab is too thick to clean the connection part on the handpiece side connector, wrap wet tissue paper or the like around a thin stick and use it to wipe the connection part carefully.



6. Blow dry air against the connection part of the handpiece cord to dry it completely. Remaining moisture causes internal corrosion.

7. Proceed to storage. => "5.11 Storage"

⚠ PRECAUTIONS

- When cleaning the connection part, do not use a stick with a sharp point or pick the terminal. Doing so may damage the contacts causing poor contact.

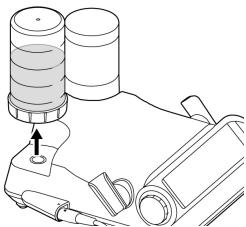
5.3.2 Irrigation bottle

■ Cleaning and disinfection

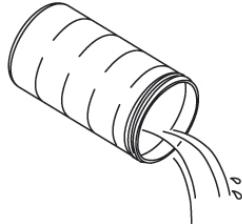
1. Remove the irrigation bottle from the bottle connector of the control unit.

=>"3.4 Connecting irrigation bottle"

Loosen and remove the bottle lid from the irrigation bottle.

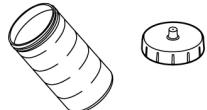


2. Drain the water remaining in the irrigation bottle.

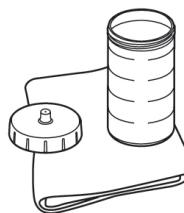


3. Rinse the irrigation bottle and bottle lid using running water.

$\geq 40 \text{ s}$  $\leq 38 \text{ }^{\circ}\text{C}$   $\geq 3.5 \text{ L/min}$



4. Wipe the surfaces of the irrigation bottle and bottle lid using a lint-free cloth dampened with disinfectant alcohol.

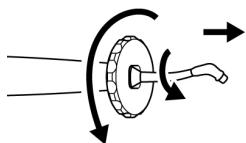


5. Tighten the bottle lid to the irrigation bottle.
6. Proceed to storage. => "5.11 Storage"

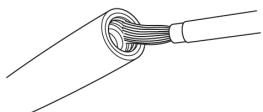
5.4 Cleaning and disinfection of the powder handpiece

5.4.1 Pre-cleaning

1. Remove the nozzle from the powder handpiece using the ring wrench (accessory).



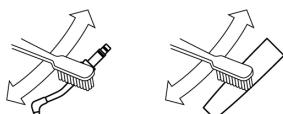
2. Remove the powder adhering to the inside of the connection part of the powder handpiece using the cleaning brush (accessory).



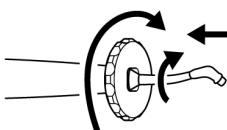
⚠ WARNINGS

- Be sure to clean the inside of the powder handpiece after use. Powder remaining in the powder handpiece may harden causing clogging.

3. Clean the powder handpiece and nozzle using running water and a soft bristle brush.

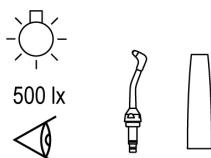


6. Attach the nozzle to the powder handpiece securely.



4. Blow dry air against the nozzle and powder handpiece to dry them completely. Remaining moisture causes internal corrosion.

5. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from step 3 until it is removed.



⚠ WARNINGS

- Perform ultrasonic cleaning at least once every week to prevent powder from clogging. Perform ultrasonic cleaning before performing the auto-cleaning or after applying the remedy described in "8 Troubleshooting". => "5.8 Ultrasonic cleaning (weekly)"
- Be sure to use the supplied ring wrench to attach and remove nozzles. When attaching or removing a nozzle, do not hold its distal end. Doing so may deform the nozzle.

5.4.2 Cleaning and disinfection

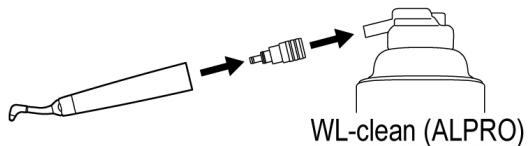
⚠ PRECAUTIONS

- Be sure to perform pre-cleaning before cleaning and disinfection.
- Be sure to perform disinfection within two hours after cleaning.
- After disinfection, be sure to sterilize the powder handpiece. => "5.9 Sterilization"
- When using any spray (ALPRO), be sure to cover the powder handpiece head with a cloth to prevent detergent and disinfection agent from scattering. We recommend that you use the spray mist absorber (Y900084).
- When using ALPRO products, refer to the manual of the manufacturer.

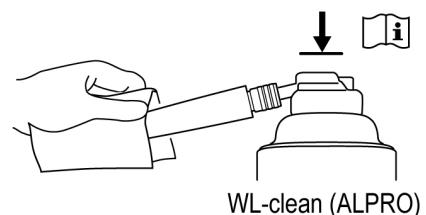
<Manual method>

■ Cleaning

1. Attach the CLA-20 to the WL-clean (ALPRO), and then attach the powder handpiece to the CLA-20.

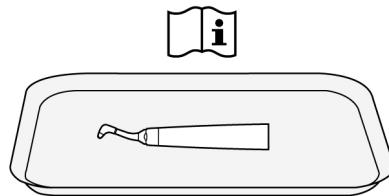


2. Spray the WL-clean (ALPRO) while holding the WL-clean (ALPRO) and the powder handpiece.



3. Remove the CLA-20 and the powder handpiece from the WL-clean (ALPRO).

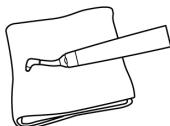
4. Remove the powder handpiece from the CLA-20, then put the powder handpiece on the disinfected tray.
5. Spray the WL-clean (ALPRO) to the powder handpiece surface, then wait for the WL-clean (ALPRO) to take effect.



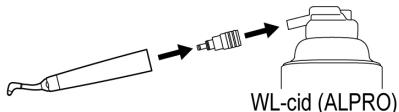
■ Disinfection

- Wipe the powder handpiece surface using a lint-free cloth dampened with disinfectant alcohol.

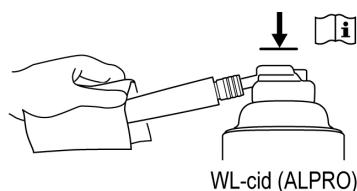
≥ 2 min



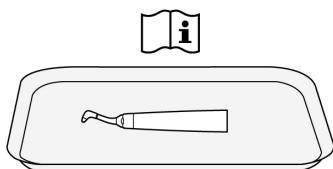
- Attach the CLA-20 to the WL-cid (ALPRO), and then attach the powder handpiece to the CLA-20.



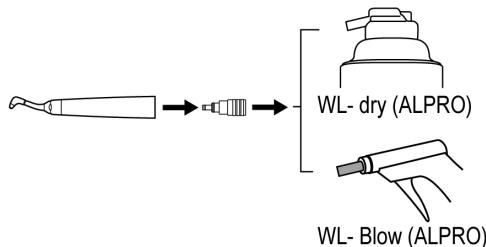
- Spray the WL-cid (ALPRO) to the powder handpiece while holding the WL-cid (ALPRO) and the powder handpiece.



- Remove the CLA-20 and the powder handpiece from the WL-cid (ALPRO).
- Remove the powder handpiece from the CLA-20, then put the powder handpiece on the disinfected tray.
- Wait for the WL-cid (ALPRO) to take effect.

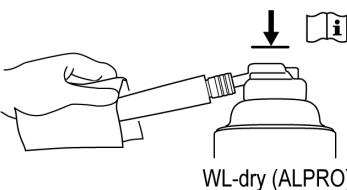


- Attach the CLA-20 to the WL-dry (ALPRO) or the WL-Blow (ALPRO), and then attach the powder handpiece to the CLA-20.

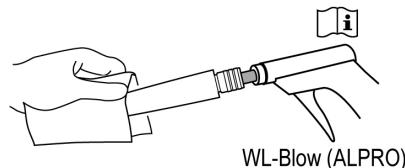


- Drain disinfectant from the powder handpiece while holding the WL-dry (ALPRO) or the WL-Blow (ALPRO) and the powder handpiece.

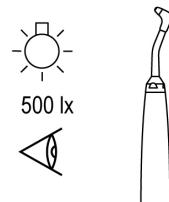
· When using the WL-dry (ALPRO):



· When using the WL-Blow (ALPRO):



- Remove the CLA-20 and the powder handpiece from the WL-dry (ALPRO) or the WL-Blow (ALPRO).
- Remove the powder handpiece from the CLA-20.
- Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from step 1 until it is removed.



- Proceed to sterilization.=> "5.9 Sterilization"

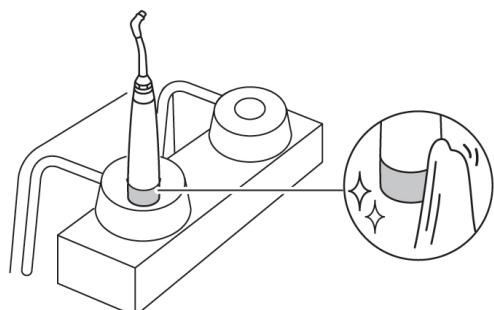
<Auto method>

! PRECAUTIONS

- Use a washer-disinfector that complies with ISO 15883.
- After the washer-disinfection and drying process, take the powder handpiece out of the washer-disinfector immediately (within an hour) and dry it completely. Moisture remaining in the powder handpiece causes internal corrosion.
- When using a washer-disinfector, use the adapter compatible with the washer-disinfector (to be prepared by the user) to clean and disinfect the powder handpiece.
- For auto-cleaning and disinfection, follow the instructions in the manual of the manufacturer of the washer-disinfector.

■ **Cleaning and disinfection (outside and inside)**

1. Wipe the outside of the handpiece hose connection part of the powder handpiece using a lint-free cloth dampened with disinfectant alcohol, and then attach the powder handpiece to the adapter of the washer-disinfector.



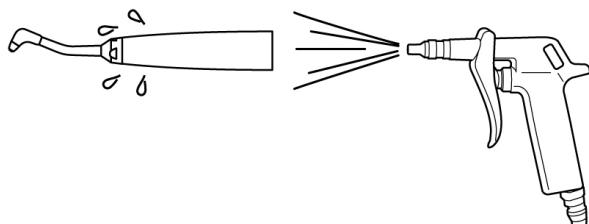
Adapter compatible with the washer-disinfector (to be purchased by the user)

Manufacturer	REF	Connection diameter (approx.)	Color
Miele	ADS 2	16 mm	Green
MELAG	63500	16 mm	Green
Getinge	502887400	16 mm	Black

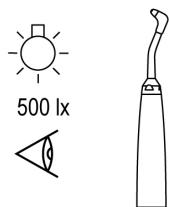
2. Perform thermal disinfection following the manual of the washer-disinfector.



3. Take the powder handpiece out of the washer-disinfector.
4. Remove the moisture from the surface and inside of the powder handpiece using an air blow gun or similar tool.



5. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from step 2 until it is removed.



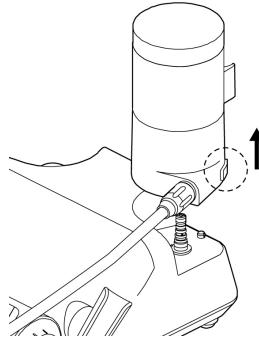
6. Proceed to sterilization. => "5.9 Sterilization"

5.5 Cleaning and disinfection of the chamber and handpiece hose

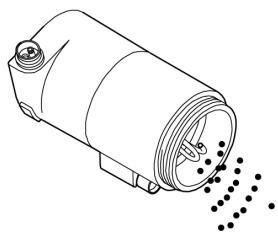
Perform the following maintenance at the end of the day's treatment.

5.5.1 Removing powder

1. Release the residual pressure from the chamber.
=> "4.2.3.3 Releasing residual pressure"
2. Push the lock button, and then remove the chamber from the chamber connector.



3. Remove the chamber lid, and then dispose of the powder in the chamber.
=> "1.5 Disposing of products"

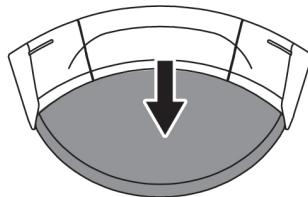


4. Tighten the chamber lid firmly, and then insert the chamber straight onto the chamber connector.

5. Set the power level and the irrigation level to "10".



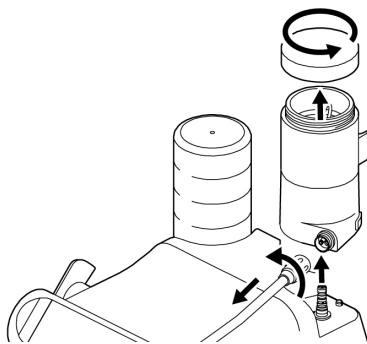
6. Point the handpiece hose at a spittoon or sink and depress the ON/OFF button of the foot control to idle the product.



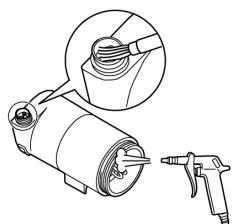
7. Perform auto-cleaning to drain the remaining powder and water from the handpiece hose. => "5.2.2 Powder"

5.5.2 Cleaning and disinfection

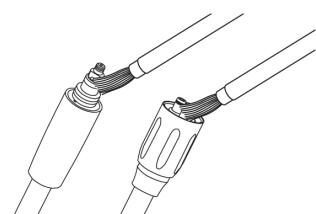
1. Release the residual pressure from the chamber.
=> "4.2.3.3 Releasing residual pressure"
2. Push the lock button, and then remove the chamber from the chamber connector.
Remove the chamber lid and disconnect the powder handpiece hose.



3. Remove the powder remaining in the chamber and handpiece hose connector using an air blow gun or similar tool.

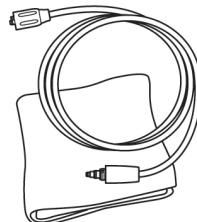


4. Remove the remaining powder from the handpiece side connector and chamber side connector of the handpiece hose using the cleaning brush.

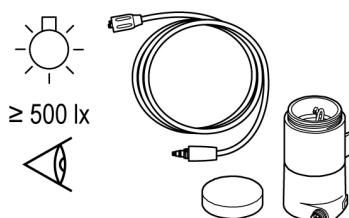


5. Make sure that no powder remains on the threads of the chamber lid. If any powder remains, clean it off.
=> "5.5.3 Cleaning chamber lid"

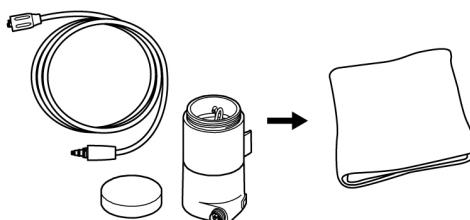
6. Wipe the soil off the handpiece hose surface using a lint-free cloth dampened with water.



7. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from the step 3 until it is removed.



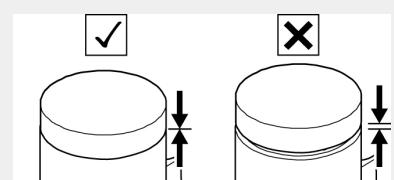
8. Wipe the surfaces of the chamber, chamber lid, and handpiece hose using a lint-free cloth dampened with disinfectant alcohol.



9. Tighten the chamber lid to the chamber firmly.
10. Proceed to storage. =>"5.11 Storage"

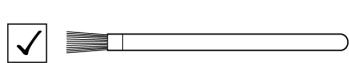
⚠️ WARNINGS

- Tighten the chamber lid firmly. Otherwise, the chamber lid may be blown off during use, which may lead to damage to the device or an injury.



⚠ WARNINGS

- Never use the cleaning wire or file supplied with the device to clean the powder handpiece hose, or other pointed or sharp tools. This could damage and/or puncture internal parts and cause the powder handpiece hose to burst.



Supplied cleaning brush



Supplied cleaning wire/file



Tools other than the accessories

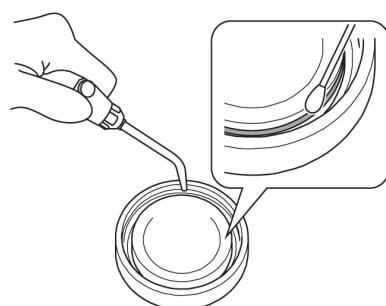
⚠ PRECAUTIONS

- If powder adheres to the threads of the chamber and/or the chamber lid, the lid will become difficult to tighten. Cleaning the chamber and chamber lid makes it easy to open and tighten the chamber lid. => "5.5.3 Cleaning chamber lid"
- If the chamber malfunctions, be sure to request your authorized NSK dealer to repair it.
- After using, remove the powder adhering to the inside of the chamber completely and clean the chamber before storing it.
- Do not wash the chamber with water. Doing so solidifies powder causing clogging.
- The air pressure in the chamber may be high, making it difficult to open the chamber lid for a while just after use. In such a case, wait a while or release the residual pressure before opening the chamber lid. => "4.2.3.3 Releasing residual pressure"
- When cleaning the connection part, do not use a stick with a sharp point or pick the terminal. Doing so may damage the contacts causing poor contact.

5.5.3 Cleaning chamber lid

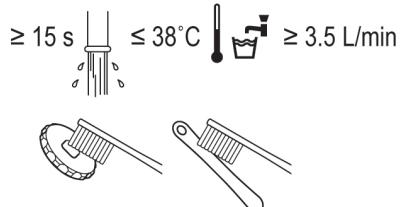
If powder adheres to the threads of the chamber and/or the chamber lid, the chamber lid will become difficult to tighten firmly. Cleaning the chamber and chamber lid following the procedure shown below makes it easy to attach/remove the chamber lid.

- Remove the chamber lid.
- Clean the inside of the chamber, threads, and the fringe of the gasket for chamber lid using a brush or dry cotton swab.
- Remove the adhering powder by blowing air.
- Proceed to storage. => "5.11 Storage"

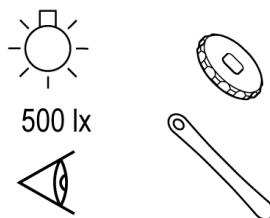


5.6 Cleaning and disinfection of the ring wrench and nozzle tip remover

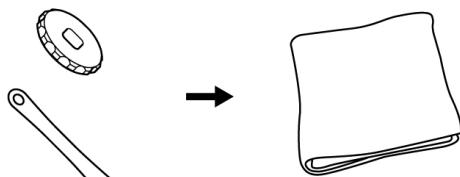
1. Clean the ring wrench and nozzle tip remover for 15 seconds or more using running water and a soft bristle brush.



2. Check for soil under appropriate illumination (500 lx or more).



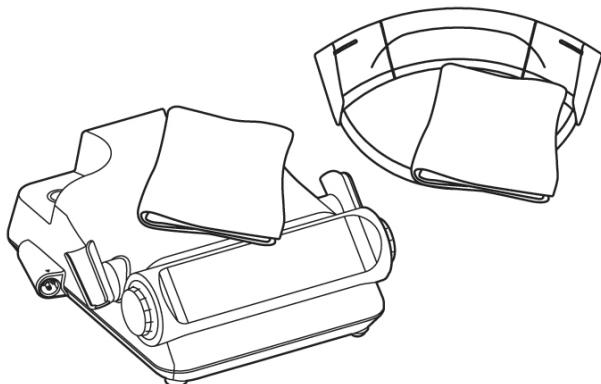
3. Wipe the ring wrench and nozzle tip remover using a lint-free cloth dampened with disinfectant alcohol.



4. Proceed to sterilization. => "5.9 Sterilization"

5.7 Cleaning control unit and foot control

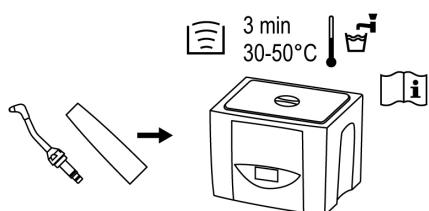
1. Turn off the power.
2. Wipe off soil from the surfaces of the control unit and foot control using a lint-free cloth dampened with water.
3. Wipe the surfaces of the control unit and foot control using a lint-free cloth dampened with disinfectant alcohol.
4. Proceed to storage. => "5.11 Storage"



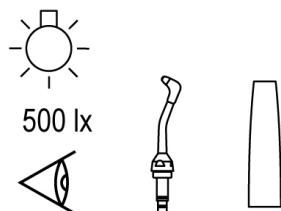
5.8 Ultrasonic cleaning (weekly)

Be sure to perform cleaning and disinfection before ultrasonic cleaning. => "5.1.3 Powder"

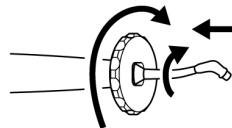
1. Remove the nozzle from the powder handpiece using the ring wrench. => "4.2.3 Operation" - "■ Attaching nozzle"
2. Clean the powder handpiece and nozzle using ultrasonic cleaning.



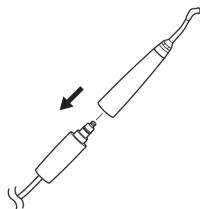
3. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat step 1 until it is removed.



4. Attach the nozzle to the powder handpiece using the ring wrench (accessory).



5. Insert the powder handpiece straight into the handpiece side connector of the handpiece hose.



6. Perform auto-cleaning and sterilization.
=> "5.2.2 Powder" and "5.9 Sterilization"

▲ PRECAUTIONS

- After ultrasonic cleaning of the powder handpiece, perform auto-cleaning to remove the internal moisture, and then dry the product sufficiently.
- After auto-cleaning, be sure to perform sterilization.
- Do not use ultrasonic cleaning to clean ultrasonic handpieces. It causes failure.

5.9 Sterilization

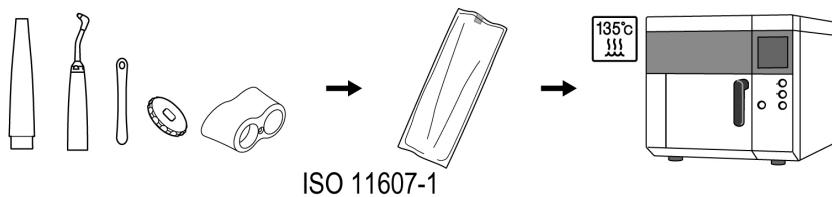
The effectiveness of the following sterilization procedure has been verified complying with ISO17665.

Sterilizable items:

Ultrasonic handpiece, powder handpiece, ring wrench, nozzle tip remover, and CLM holder

1. Put the items into a sterilization pouch that complies with ISO 11607-1, and then seal the pouch.
2. Sterilize them with the following conditions.

Type	Gravity displacement (Class N)	Pre-vacuum (Class B)
Temperature	132 °C	134 °C
Sterilization time	15 min or more	3-18 min



3. Proceed to storage. =>"5.11 Storage"

⚠ PRECAUTIONS

- The control unit, foot control, handpiece cord, handpiece hose, irrigation bottle, CLM bottle, chamber, CLA-10, CLA-20, and O-rings cannot be sterilized.
- The nozzle tip is a single-use item. Do not reuse or re-sterilize it as product breakage or infection could occur.
- Use a sterilization pouch that complies with ISO 11607-1.
- Do not use sterilization pouches containing water-soluble adhesive components such as PVA (polyvinyl alcohol). Adhesive components washed out during sterilization may enter the product, causing problems such as malfunction, sticking and failure to operate correctly.
- Do not put other instruments together with the items of this product in a sterilization pouch to perform the autoclave sterilization. Doing so discolors the product surface and affects internal parts. In addition, pay attention not to let chemicals enter the product during the autoclave process.
- Be sure to use sterilizers that can perform sterilization up to 135 °C.
- Do not use a sterilizer that exceeds 135 °C during the dry cycle. It causes a failure of the product. For details, consult the manufacturer of the sterilizer.
- Do not heat or cool the product rapidly during the sterilization. Rapid changes in the temperature deteriorate the product.
- Do not touch the product just after the sterilization because it is hot.
- Do not sterilize using ultraviolet light. Doing so may result in discoloration.
- For this product, the effectiveness of sterilization methods (such as the plasma sterilization and EOG sterilization) other than autoclave sterilization is not verified.
- After sterilization is completed, take the product out of the sterilizer within an hour. Failure to do so may cause corrosion.

⚠ PRECAUTIONS

- If water drops remain on the handpiece after sterilization, be sure to wipe them up. Failure to do so may result in discoloration.

NOTICE

- We recommend the class B sterilizer stipulated in EN13060.
For details, refer to the operation manual issued by the manufacturer of the sterilizer.
- Although the ultrasonic handpiece and the powder handpiece may discolor due to the heat after repetitions of the autoclave sterilization, it is due to the characteristics of the product and does not indicate any problem in the quality of the product.

5.10 Decontamination and prevention of biofilm formation of water circuit (twice per week)

Disinfect the water circuit using b.clean or Bilpron (ALPRO) (undiluted).

Be sure to perform auto-cleaning, cleaning, and disinfection before the maintenance of the water circuit.

In this chapter, maintenance of water circuit is collectively referred to as CLM mode.

⚠ WARNINGS

- Be sure to perform maintenance of the water circuit twice per week at the end of the working day. If there is no proper maintenance, it may cause infection or clogging.
- Because chemicals are used in the CLM mode, the product cannot be used for usual treatment until the CLM mode is completed.
- After the CLM mode is completed and before the treatment, depress the ON/OFF button of the foot control to make sure that clean water comes out of the ultrasonic handpiece or powder handpiece appropriately.
- For the maintenance of this product, use the detergent and disinfectant specified in this manual. The use of detergent or disinfectant other than those specified in this manual may cause a failure of this product, maintenance failure, and/or the patient's infection.
- Rotate the water volume adjustment dial of the ultrasonic handpiece and powder handpiece, and set the irrigation level to "10" before the maintenance of the water circuit to clean it properly.

⚠ PRECAUTIONS

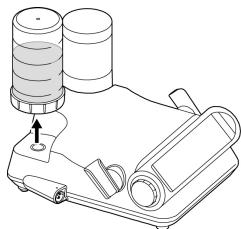
- In the CLM mode, b.clean or Bilpron (ALPRO) or drinking water for the rinse is drained from the handpiece cord and handpiece hose. Before starting the CLM mode, insert the handpiece cord and handpiece hose to the CLM holder, and then lay it on a spittoon or sink.

NOTICE

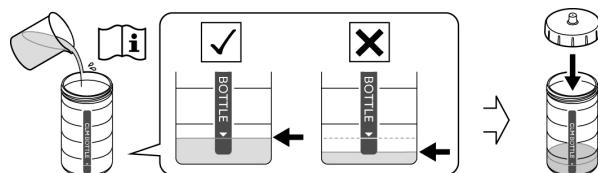
- Before activating CLM, make sure to run D or P mode.

5.10.1 Preparation

1. Remove the irrigation bottle from the bottle connector.
2. Disinfect the irrigation bottle. => "5.10.3 Irrigation bottle"



3. Fill the CLM bottle with b.clean or Bilpron (ALPRO) (undiluted), and then tighten the bottle lid.



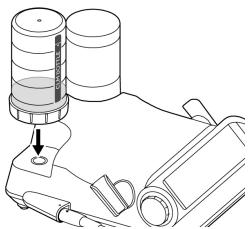
■ Setting mode and system combinations

Setting mode	CM A	CM B	CM C	CM D
Device combination	Varios Combi Pro2	Varios Combi Pro2 + CLM Module	Water Bottle Kit + Varios Combi Pro2	Water Bottle Kit + Varios Combi Pro2 + CLM Module
Amount of b.clean/ Bilpron				

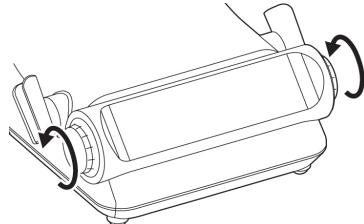
⚠ PRECAUTIONS

- Be sure to fill the CLM bottle with b.clean/Bilpron (undiluted) according to the above table.
- Be sure to change the CLM setting if the combination of devices used changes.

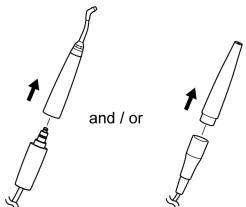
4. Insert the CLM bottle to the bottle connector.



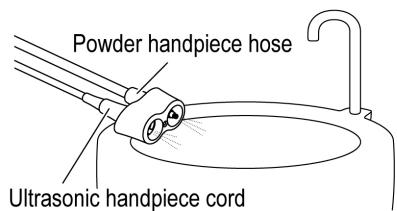
5. Rotate both water volume adjustment dials and set the irrigation level to "10".



6. Remove handpiece cord and/or handpiece hose from each handpiece.

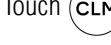


7. Insert the handpiece side connector on the handpiece cord or handpiece hose to the CLM holder, then lay it on a spittoon or sink.



5.10.2 CLM mode

■ Filling

1. Touch **CLM** for three seconds.
2. A beep sounds, the following screen is displayed, and  flashes.



3. Touch **CLM** for three seconds.
4. A beep sounds, "FILLING" is shown on the display, and the water circuit starts to be filled with b.clean or Bilpron.

 (flash): Filling the powder water circuit with b.clean or Bilpron

 (flash): Filling the ultrasonic water circuit with b.clean or Bilpron

Progress status can be checked with the increase of progress bar.

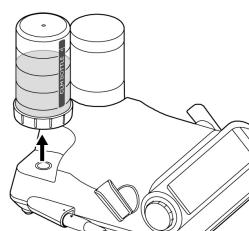


■ Rinsing

1. After 12 hours, turn on the power, a beep sounds, the following screen is displayed, and  flashes.



2. Remove and rinse the CLM bottle. => "5.10.4 CLM bottle"

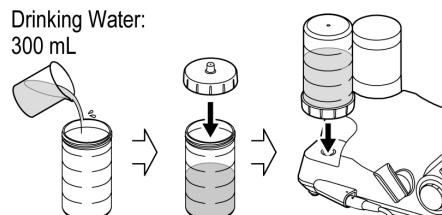


5. After the completion of filling with b.clean or Bilpron to the water circuit, the following screen is displayed and  flashes.



6. Turn off the power, and then leave the product alone for 12 hours or more for disinfection.

3. Fill the disinfected irrigation bottle with 300 mL of drinking water, and then insert the irrigation bottle to the bottle connector.



⚠ PRECAUTIONS

- Be sure to fill the disinfected irrigation bottle with drinking water 300 mL.
- Be sure to open the water valve of the dental chair unit before rinsing.

4. Touch **CLM** for three seconds.
5. A beep sounds, and the following screen is displayed. The water circuit is automatically drained of b.clean or Bilpron, and the water circuit is rinsed. Progress status can be checked with the decrease of progress bar.



*  (flash): Draining b.clean or Bilpron and rinsing the powder water circuit

*  (flash): Draining b.clean or Bilpron and rinsing the ultrasonic water circuit

*  (flash): Draining b.clean or Bilpron and rinsing the common water circuit of the ultrasonic and powder

6. After the rinse, a beep sounds, and the following screen is displayed with the completion of CLM mode.



7. Touch **CLM** to return to the screen before the CLM mode.
8. Pull out the handpiece cord and handpiece hose from the CLM holder.
9. After performing maintenance on the water circuit, when treating a patient, be sure to connect the sterilized ultrasonic handpiece and powder handpiece to the handpiece cord and handpiece hose.
- * When you do not treat patients, proceed to storage. => "5.11 Storage".
10. Perform check before treatment. => "3.15 Check before treatment"

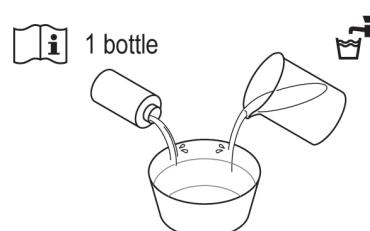
5.10.3 Irrigation bottle

■ Disinfection

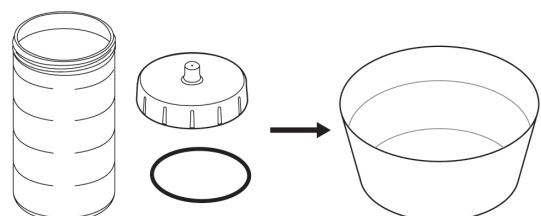
1. Remove the bottle lid from the irrigation bottle.
2. Remove the gasket from the bottle lid.
3. Rinse the irrigation bottle, bottle lid and gasket using running water.



4. Mix a bottle of BC-San 100 (ALPRO) and drinking water to make disinfectant.

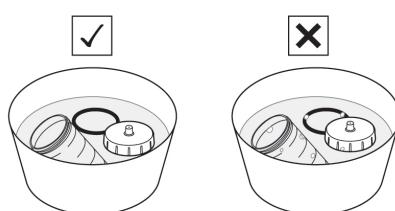


5. Soak the irrigation bottle, bottle lid and gasket in the disinfectant.



6. Make sure that no bubbles form on the irrigation bottle, bottle lid and gasket, and then leave them alone for six hours.

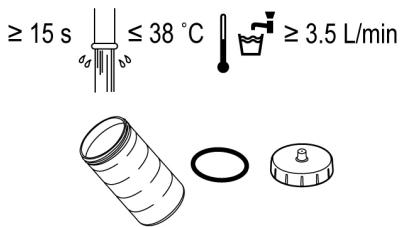
* If there are any bubbles, remove them.



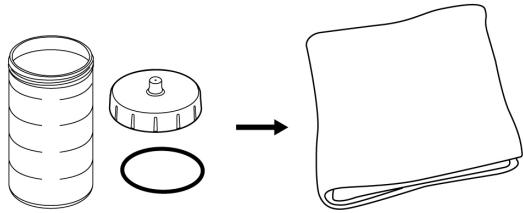
5 Post-use Maintenance

■ Rinsing

1. Take the irrigation bottle, bottle lid and gasket out of the disinfectant, and then rinse them using drinking water.



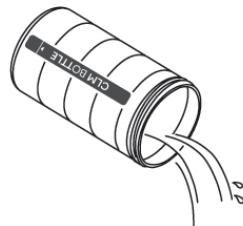
2. Wipe the water off the surfaces of the irrigation bottle, bottle lid and gasket using a clean and dry cloth.



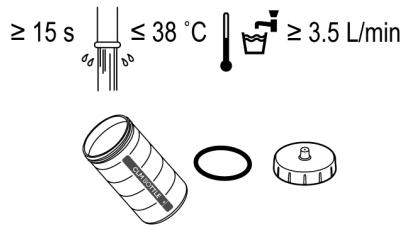
5.10.4 CLM bottle

■ Rinsing

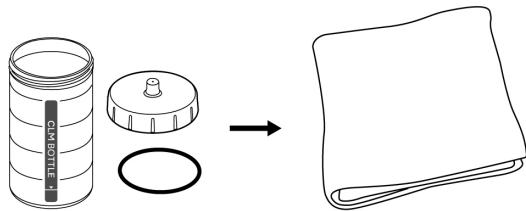
1. Dispose of b.clean or Bilpron in the CLM bottle.



2. Rinse the CLM bottle, bottle lid and gasket using running water.



3. Wipe the water off the surfaces of the CLM bottle, bottle lid and gasket using a clean and dry cloth.



4. Attach the gasket to the bottle lid.

5. Tighten the bottle lid to the bottle, then proceed to storage. => "5.11 Storage"

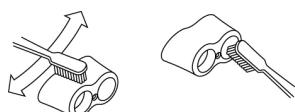
5.10.5 CLM holder

Be sure to clean, disinfect, and sterilize the CLM holder after using it.

■ Cleaning

1. Clean the CLM holder for 20 seconds or more using running water and a soft bristle brush.

$\geq 20\text{ s}$  $\leq 38\text{ }^{\circ}\text{C}$  $\geq 3.5\text{ L/min}$

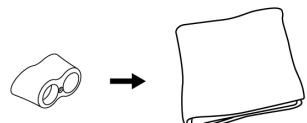


2. Check for soil under appropriate illumination (500 lx or more). If there is soil, repeat from step 1 until it is removed.

 $\geq 500\text{ lx}$ 

■ Disinfection

1. Wipe the CLM holder surface using a lint-free cloth dampened with disinfectant alcohol.



2. Proceed to sterilization. => "5.9 Sterilization"

5.11 Storage

Store the product in an environment where the product is kept disinfected and sterilized until the next use.

⚠ PRECAUTIONS

- Store the product in a well-ventilated place out of direct sunlight and within the range of temperature, humidity and pressure specified in "10 Specification". The air should be free from dust, salt, and sulphur.

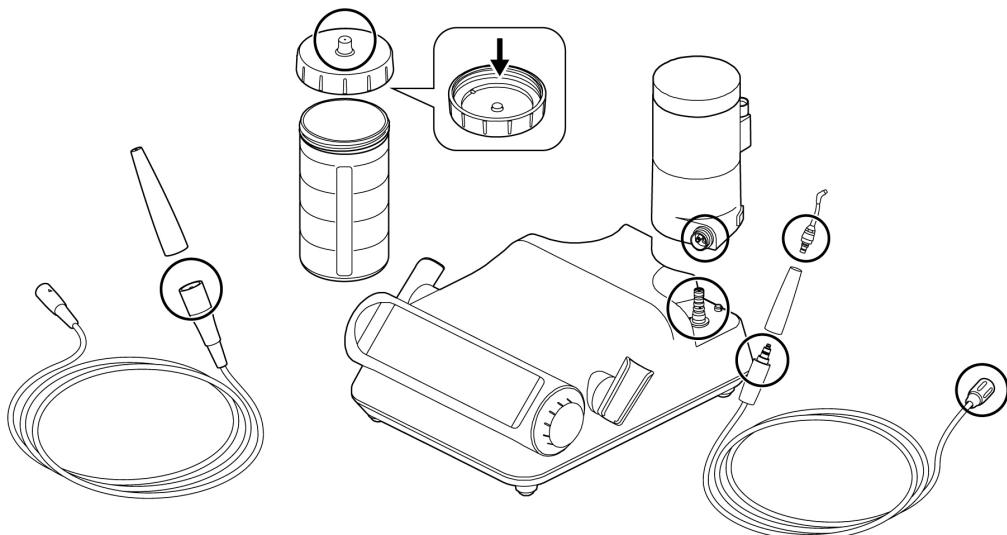
6 Maintenance

6.1 Maintaining O-rings

Maintain O-rings to inhibit the wear on O-rings of each part and prevent water and air leaks.

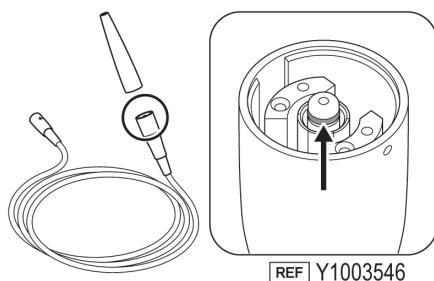
⚠ PRECAUTIONS

- The size and thickness vary depending on the O-ring. Be sure to attach each O-ring to the correct position.
- Turn off the power switch before carrying out maintenance.



6.1.1 Handpiece cord

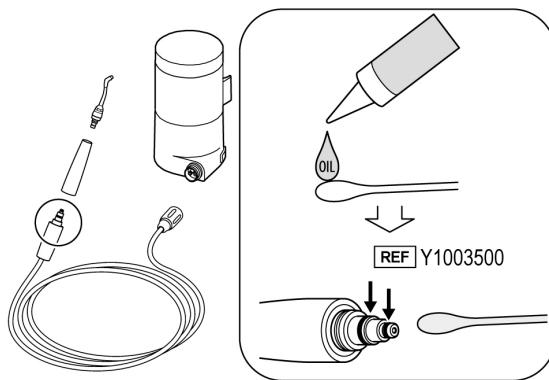
1. Disconnect the handpiece cord from the control unit.
2. Remove the O-ring to be replaced using a needle or similar tool.
3. Insert a new O-ring into the groove you removed the old O-ring from.



6.1.2 Handpiece hose (Prophy-Hose2/Perio-Hose2)

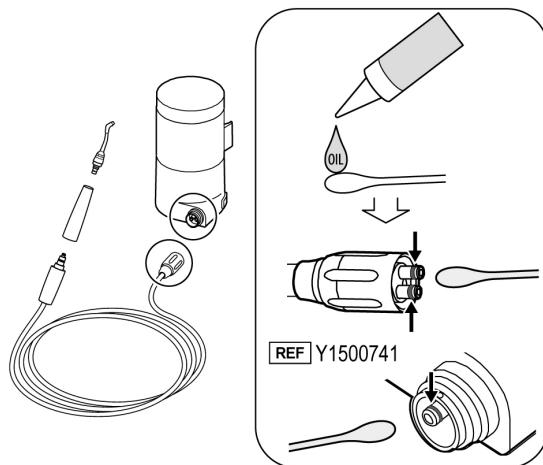
■ Handpiece side connector

1. Disconnect the handpiece hose from the powder handpiece and chamber.
2. Remove the O-ring from the handpiece side connector of the handpiece hose using a needle or similar tool. If powder adheres to the O-ring groove, clean it before inserting a new O-ring.
3. Insert a new O-ring into the grooves.
4. Drop a droplet of the supplied lubrication oil on the swab.
5. Apply the lubrication oil using swab to the O-ring.



■ Chamber side connector and chamber

1. Disconnect the handpiece hose from the powder handpiece and chamber.
2. Remove the O-ring from the chamber side connector of the handpiece hose using a needle or similar tool. If powder adheres to the O-ring groove, clean it before inserting a new O-ring.
3. Insert a new O-ring into the grooves.
4. Drop a droplet of the supplied lubrication oil on the swab.
5. Apply the lubrication oil using swab to the O-ring.

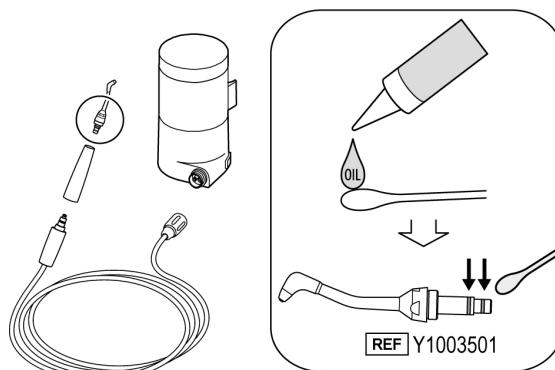


⚠ PRECAUTIONS

- Be sure to apply the lubrication oil to the O-ring. Failure to do so may incur the following risks:
 - 1) The hose plug is damaged.
 - 2) The rotation of the handpiece connection part requires more force.
 - 3) Water leaks.
- Apply the lubrication oil only to the O-ring. If the lubrication oil gets into the air hole, it causes the clogging of powder.

6.1.3 Nozzle (for prophy/perio use)

1. Pass through the ring wrench (accessory) from the nozzle end, and then loosen the nozzle.
2. Remove the nozzle from the powder handpiece.
3. Remove the O-ring from the nozzle base using a needle or similar tool.
4. If powder adheres to the O-ring groove, clean it before inserting a new O-ring.
5. Insert a new O-ring into the grooves.
6. Drop a droplet of the supplied lubrication oil on the swab.
7. Apply the lubrication oil using swab to the O-ring.



6.1.4 Irrigation bottle and CLM bottle

■ Bottle lid connector

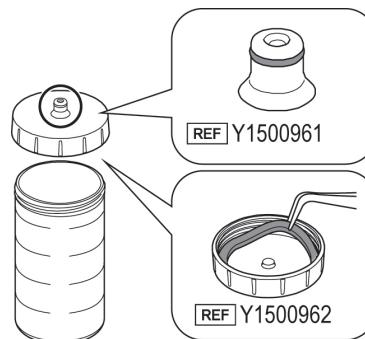
1. Remove the O-rings for the bottle from the irrigation bottle joint using a needle or similar tool.

2. Insert new O-rings into the grooves.

■ Bottle lid

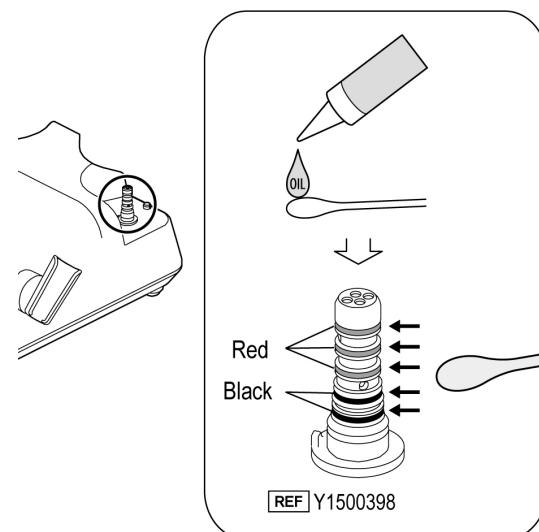
1. Remove the gasket from the bottle lid.

2. Attach the new gasket to the bottle lid.



6.1.5 Chamber connector

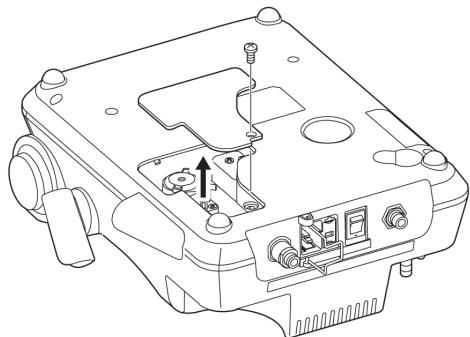
1. Remove the O-rings from the chamber base connector using a needle or similar tool.
2. Insert new O-rings into the grooves.
3. Drop a droplet of the supplied lubrication oil on the swab.
4. Apply the lubrication oil using swab to the O-ring.



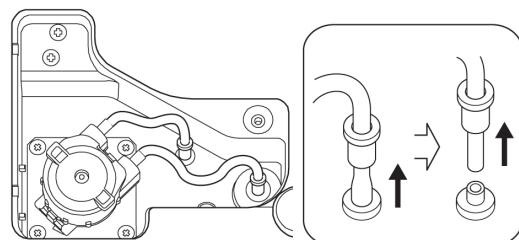
6.2 Replacing the pump

Pump life cycle is 500 hours, and it needs to be replaced every 500 hours (actual use time).

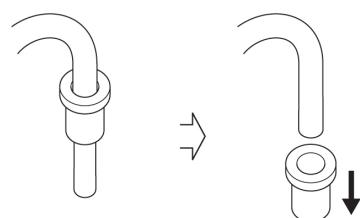
1. Remove the irrigation bottle, chamber, AC power cord, handpiece cord, and handpiece hose from the control unit.
2. Invert the control unit.
Remove the screw, and then the irrigation pump cover.



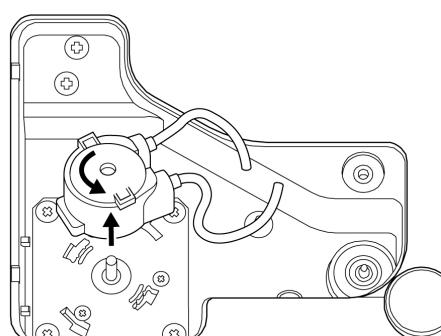
3. Disconnect the two irrigation tubes.



4. Remove the connector ring from each irrigation tube.
The removed rings will be reused for the new pump, so be careful not to lose them.

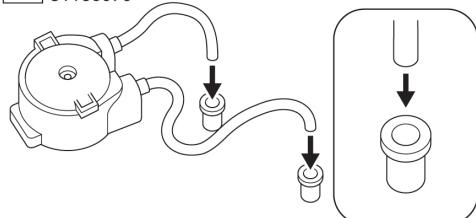


5. Rotate the irrigation pump in the arrow direction until it clicks, and then pull it out straight.

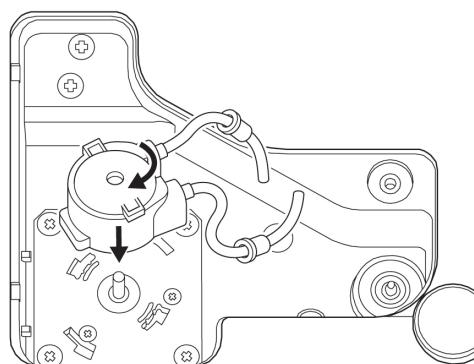


6. Attach the connector ring to each of the two irrigation tubes of the new irrigation pump (option). Make sure that the orientation of the rings is correct.

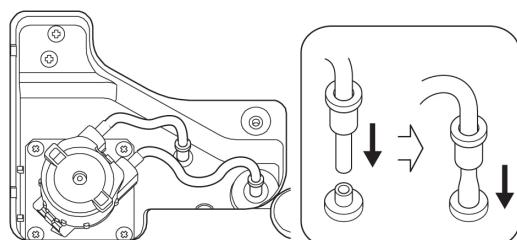
REF U1135079



7. Mount the new irrigation pump (option) by slowly inserting it into the drive shaft, and then rotating the pump in the arrow direction until it clicks.



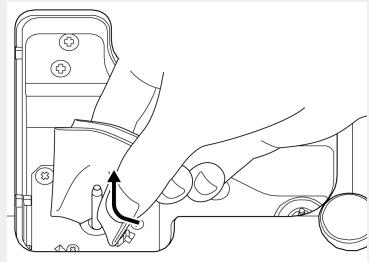
8. Connect the irrigation tubes in the reverse order of the removal procedure, and then insert the connector rings fully into the control unit.



9. Perform removal step 2 in reverse order to attach the irrigation pump cover.

⚠ PRECAUTIONS

- Before replacing the irrigation pump, wipe the water off the pump and drive shaft and dry them. If they are wet during the replacement, the roller in the pump slips causing a malfunction.
- When wiping soil and/or moisture off the drive shaft, wipe it from the base to the top. (Refer to the figure.)
- Insert the drive shaft into the irrigation pump slowly and carefully. If you insert it forcibly, the roller in the pump may be damaged.
- After replacing the irrigation pump with a new one, select the bottle for irrigation mode, set the irrigation level to the maximum, and then operate the product for about ten seconds so that the irrigation tube adapts to the new pump.
- Do not twist or bend the tubes when connecting them. If you do so, water may not come out.
- Do not pinch the tube when attaching the irrigation pump cover.
- Use a NSK genuine product when replacing the irrigation pump (designated item). Other pumps cannot be used for this product.



NOTICE

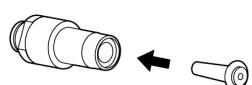
- The drive shaft is soiled after a long period of use. The soil may inhibit the rotation of the pump, so wipe it off periodically using a cloth dampened with disinfectant alcohol.
- The pump is a consumable. If the water volume significantly decreases during use, replace the pump with a new one.

6.3 Replacing the water filter

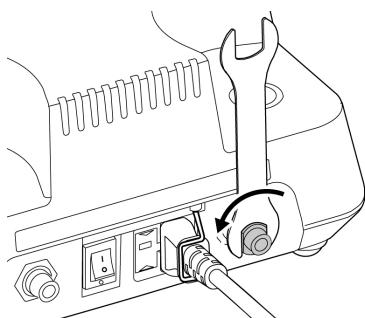
Replace the water filter once a year, if tap water is used.

If the water volume decreases, replace the water filter even before a year has passed.

- Close the water valve of the dental unit.
- Push and hold the green ring of the water hose connector toward the control unit and pull out the water hose.
- Before starting the work, lay a cloth under the control unit to catch any potential water leaks.
- Rotate the spanner wrench in the arrow direction to remove the water filter case.
- Remove the used water filter from the water filter case and then insert a new water filter into it.



- Attach the water filter case to the control unit by twisting it lightly.
- Perform step 4 in the reverse order to secure the water filter.
- Proceed to connecting water hose. => "3.3 Connecting water hose"

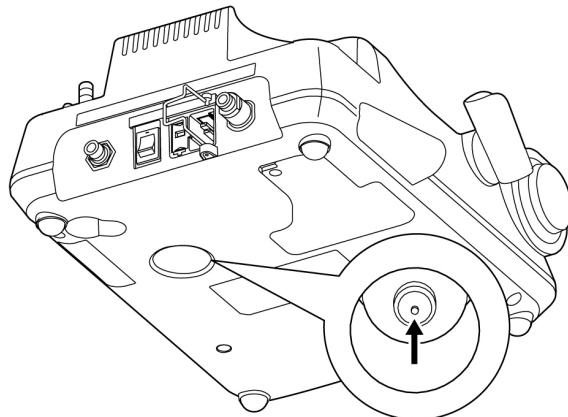


⚠ PRECAUTIONS

- Make sure that an O-ring is mounted to the new water filter before replacing the water filter. If the water filter case is attached to the control unit without the O-ring mounted, water leaks from the water filter case causing insufficient irrigation level.

6.4 Checking air filter

If the power has dropped or the product is easily clogged with powder, push the end of the air filter on the bottom of the control unit to drain water.



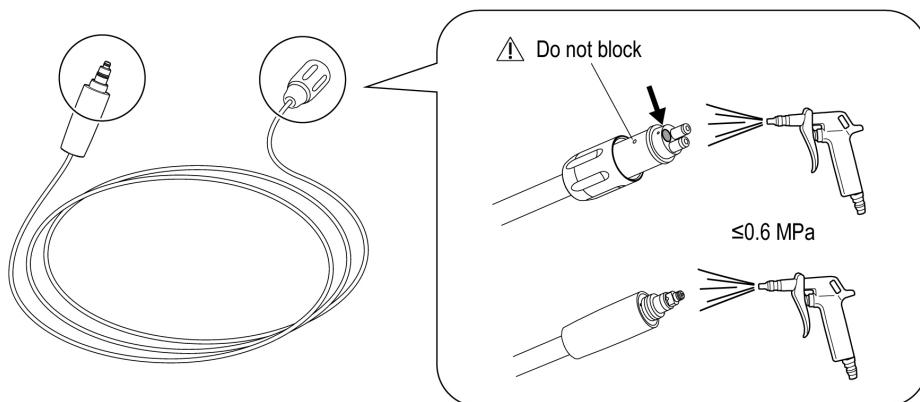
If sufficient power cannot be gained after a period of prolonged use, the element may have been clogged. In such a case, contact your authorized NSK dealer.

6.5 Foot control calibration

The response of the wireless foot control button may become poor due to wear of parts over time. In that case, perform calibration. =>"7.3.8 Foot control calibration".

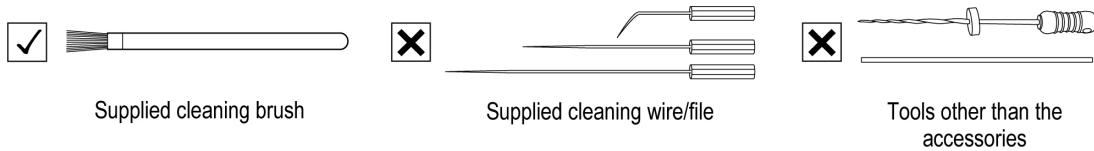
6.6 Maintaining handpiece hose

If the handpiece hose is clogged with powder, remove powder from the chamber/handpiece side connector using an air blow gun, 3 in 1 syringe or similar tool.



⚠ WARNINGS

- Never use the cleaning wire or file supplied with the device to clean the powder handpiece hose, or other pointed or sharp tools. This could damage and/or puncture internal parts and cause the powder handpiece hose to burst.



6.7 Periodical maintenance checks

Refer to the check sheet below and perform periodical maintenance checks every three months. Contact your authorized NSK dealer if any abnormalities are found.

Points to check	Details
Ultrasonic handpiece	Operate the ultrasonic handpiece to check that there is no abnormal vibration, noise, heat, etc. Also check that the LED lights and water flows.
Chamber lid	Check that there are no large or deep scratches.
Chamber	Check that there are no large or deep scratches.
Powder spray	After filling the powder chamber, spray powder into a spittoon, etc., and check that powder is not leaking from connections other than the nozzle tip connection.
Water spray	After filling the powder chamber, spray water into a spittoon, etc., and check that water is not leaking from connections other than the nozzle tip connection.
Attachment and removal of each handpiece, handpiece cord, handpiece hose, irrigation bottle, and chamber	Check that they can be attached and removed smoothly. If they are too loose or too tight, O-rings may be damaged or deteriorated. Replace them with new ones. => "6-1 - 6-6".
Air filter	Check that no dirt is attached to the air filter. Drain the air filter.

■ Additional safety information

Periodical safety testing shall be performed every two years following IEC 62353 (EN 62353), in accordance with test procedure OM-DE1031EN.

As periodical safety testing is limited exclusively to professional dental installers who have been trained and qualified under the control of NSK, contact your authorized NSK dealer.

7 Setting

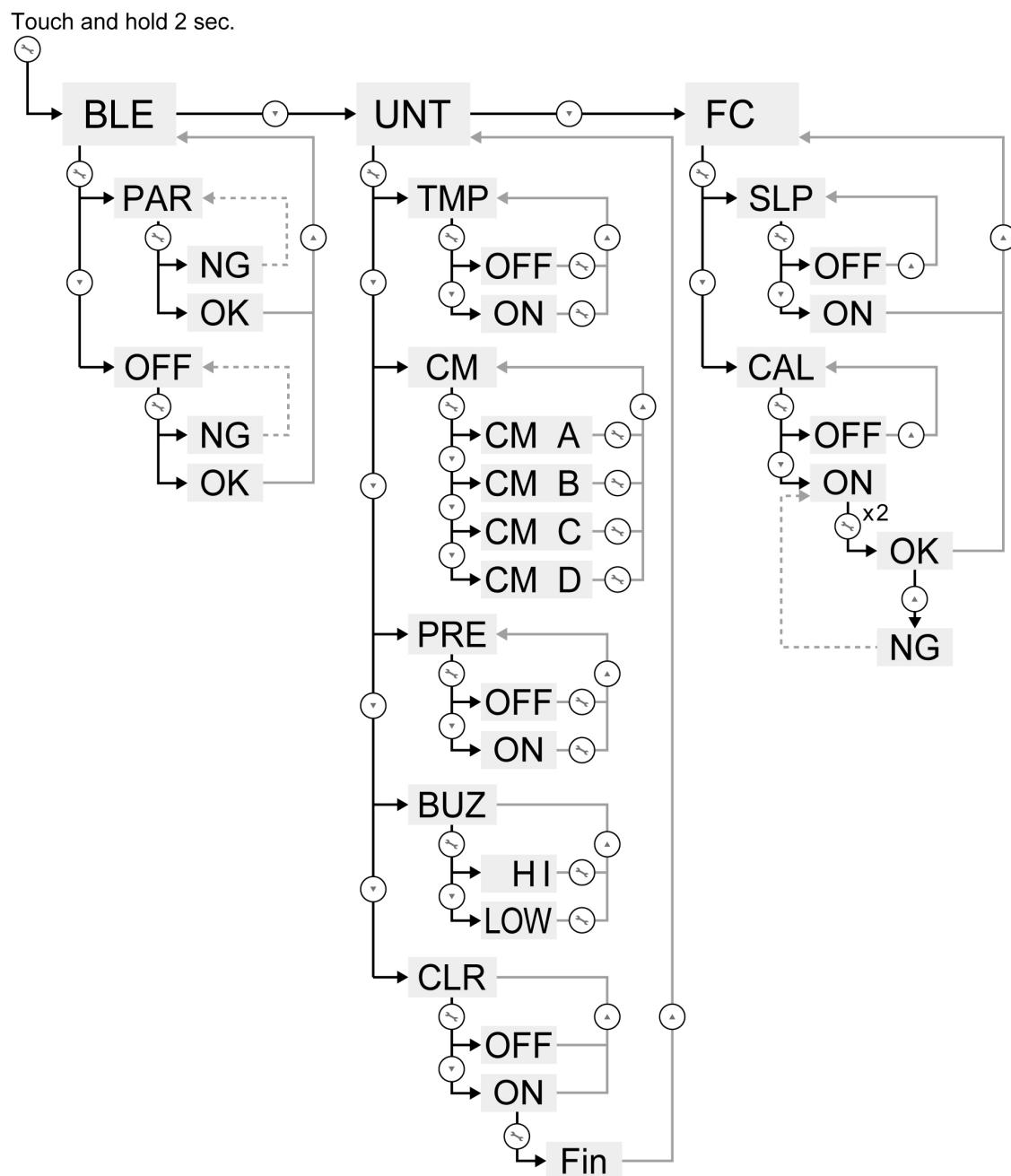
You can change the settings of the control unit and foot control.

For information on the setting items and factory default settings, refer to "7.3.1 to 7.3.8".

7.1 Setting keys

No.	Key	Name	Function
1		Cancel key	Returns to the upper menu level.
2		Enter key	Finalizes the settings or saves the setting value.
3		Next key	Moves to the next menu or changes the setting value.

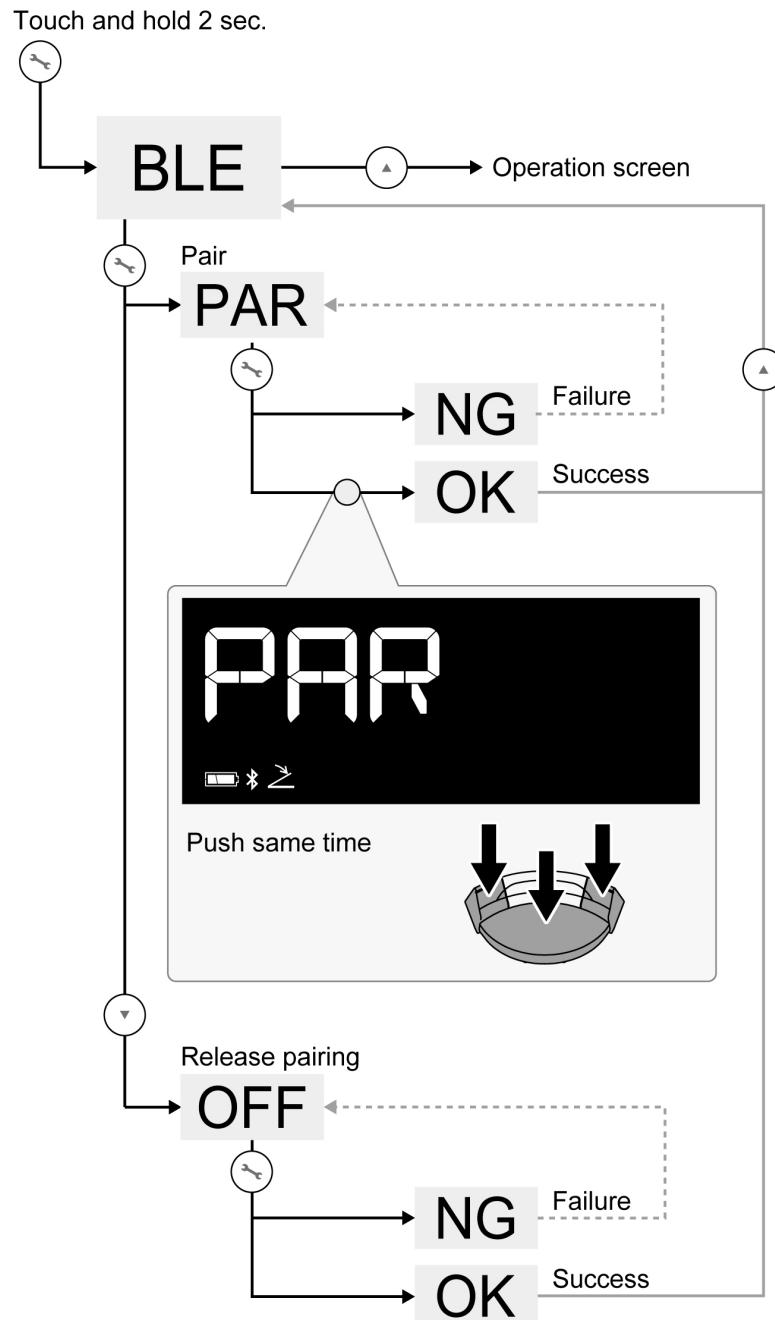
7.2 Setting transition diagram



7.3 Various settings

7.3.1 Pairing/unpairing foot control

Default setting: PAR (paired)



⚠ PRECAUTIONS

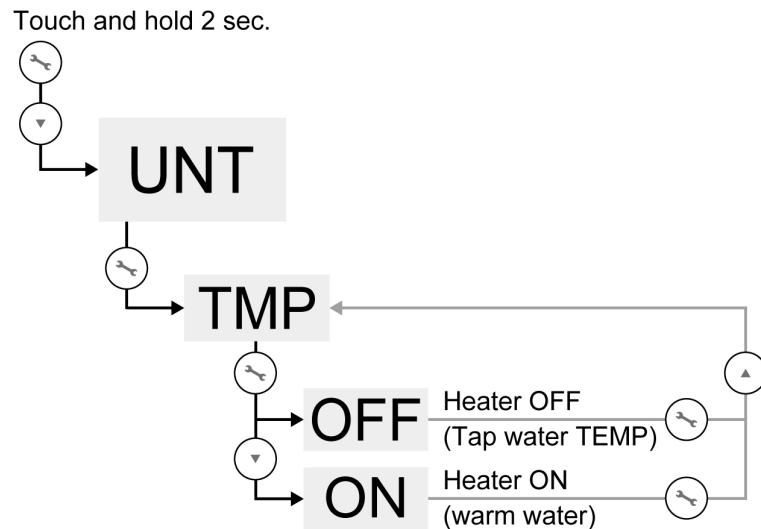
- Pairing may not be possible if something is obstructing the signal between the foot control and control unit.

NOTICE

- If pairing cannot be accomplished, replace the batteries with new ones.
- Paring can be done within 10 minutes after inserting the battery.
- Pairing is not possible after about 10 minutes. Remove the battery and then reinsert it.

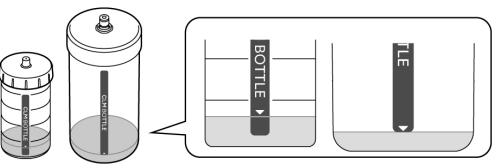
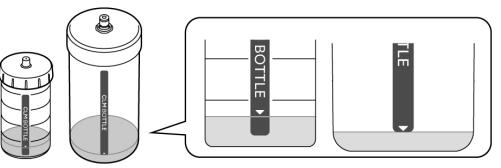
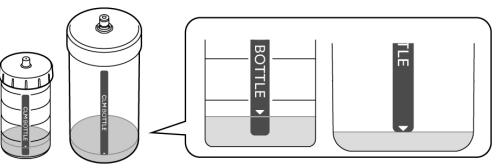
7.3.2 Setting warm water

Default setting: ON (warm water)



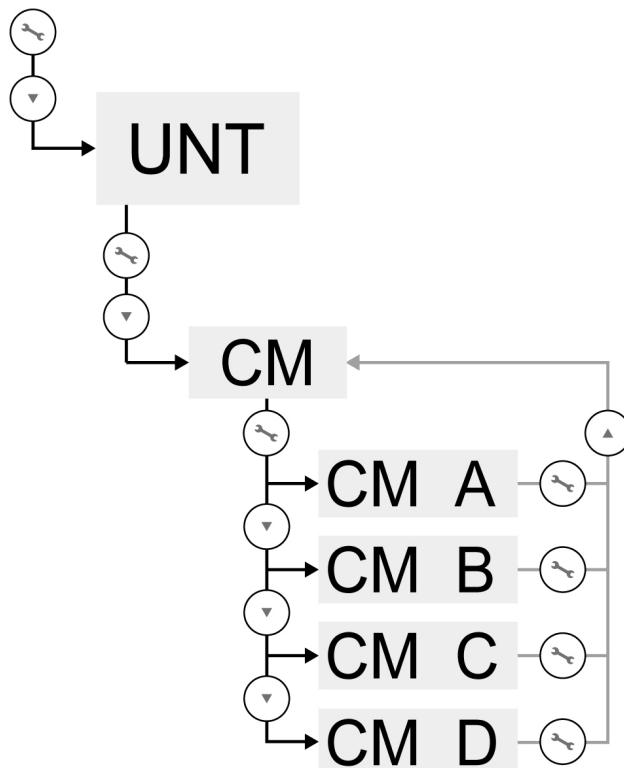
7.3.3 Choosing the correct cleaning mode program

Select the mode according to the combination of devices used.

Setting mode	CM A	CM B	CM C	CM D
Device combination	Varios Combi Pro2	Varios Combi Pro2 + CLM Module	Water Bottle Kit + Varios Combi Pro2	Water Bottle Kit + Varios Combi Pro2 + CLM Module
Amount of b.clean/ Bilpron				

Default setting: CM A

Touch and hold 2 sec.



⚠ PRECAUTIONS

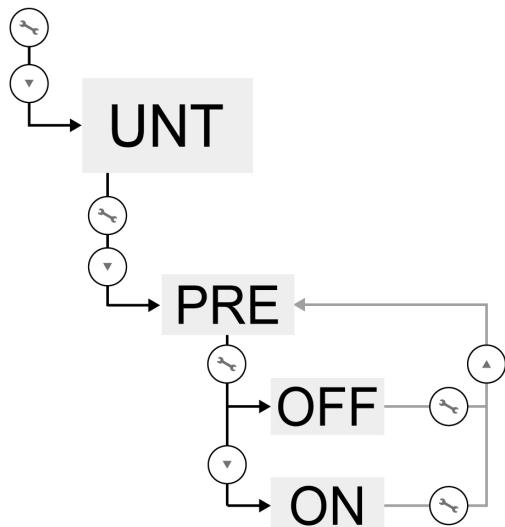
- Be sure to fill the CLM bottle with b.clean/Bilpron (undiluted) according to the above table.
- Be sure to change the CLM setting if the combination of devices used changes.

7.3.4 Setting rinse time

After self-cleaning has been carried out, there is no water in the powder handpiece and powder hose. Activating this function ("ON") means that water is immediately available when returning to operating mode and the powder treatment can be started immediately.

Default setting: OFF

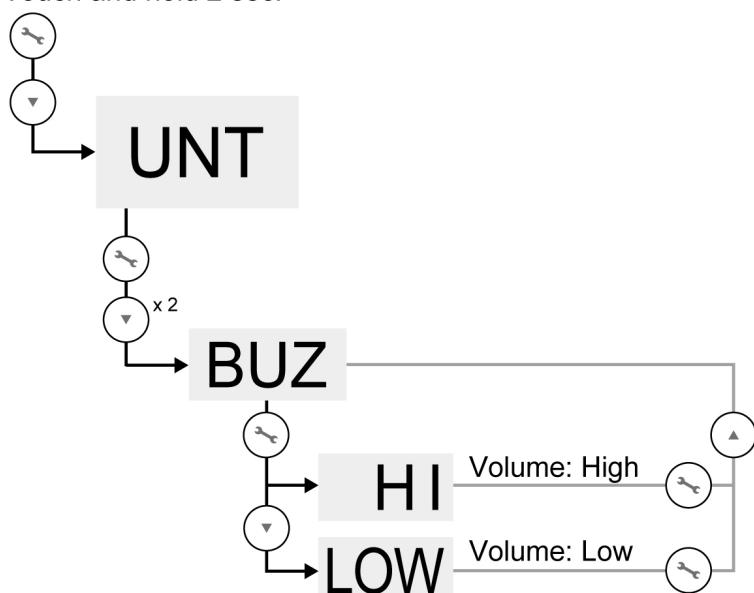
Touch and hold 2 sec.



7.3.5 Setting buzzer volume

Default setting: HI

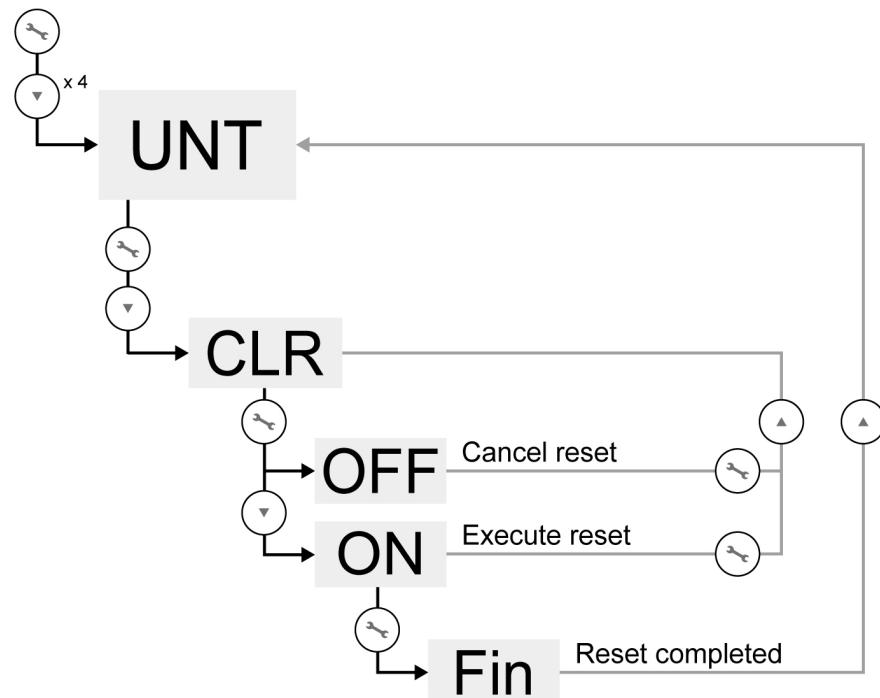
Touch and hold 2 sec.



7.3.6 Restoring factory settings

Default setting: OFF (factory settings)

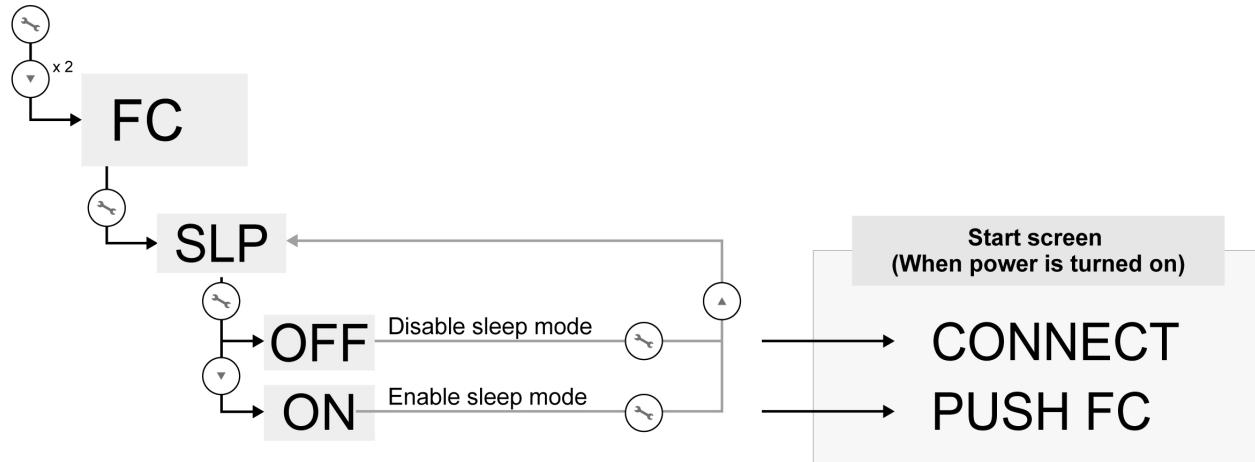
Touch and hold 2 sec.



7.3.7 Setting sleep mode of the foot control

Default setting: OFF

Touch and hold 2 sec.



■ Release sleep mode:

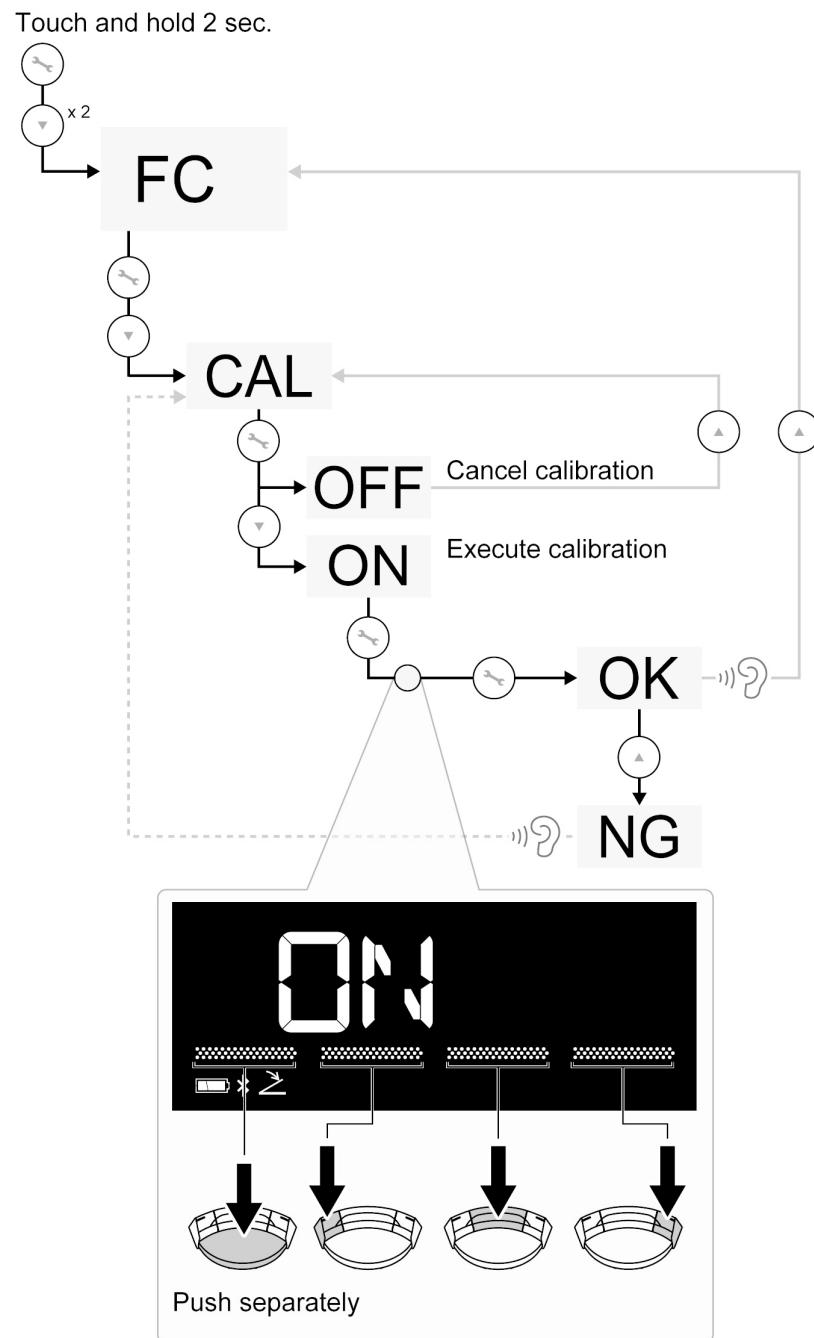
When the foot control is left unused for a certain period of time:

- "SLEEP" is displayed and " \geq " flashes.
- Depress the ON/OFF button. When the sleep mode is released, the screen before sleep is displayed.
* If an error indication is displayed, refer to "8.1 Error indication".



7.3.8 Foot control calibration

Default setting: OFF

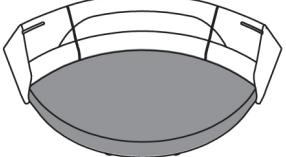


▲ PRECAUTIONS

- Do not touch any key until all the progress bars turn on.
- If the calibration fails, "NG" is shown on the display. In such case, repeat the procedure.

8 Troubleshooting

8.1 Error indication

Error indication	Cause of error	Release method
	Wireless communication disconnected during ultrasonic mode or powder mode.	Touch  .
		Depress the ON/OFF button. 
	"BATTERY" is illuminated and  is flashing. Battery less than 10 %.	Replace the battery. => "3.10 Installing foot control batteries"
	The ON/OFF button of the foot control is depressed even though the chamber is not attached.	Attach the chamber to the control unit then operate the powder mode.
	The ON/OFF button of the foot control is depressed even though the irrigation level is "0".	Rotate the water volume adjustment dial and adjust the irrigation level (1 - 10).
	Keep pressing the ON/OFF button when exiting the sleep mode.	Release the ON/OFF button.

8.2 Error codes

If an error occurs and causes the device to stop, "ERROR" and error code are displayed on the LCD, and a beep sounds to make it easy to check the status of the control unit and identify the cause of the error. The error code will continue to blink until the issue is resolved.

Depress the ON/OFF switch or touch the cancel key to perform an error check. If no error is found, the error condition can be canceled. If the foot control is not connected, touch the cancel key to cancel the error condition.

Error code	Description of error	Check/Remedy
ERROR 0	System error	Turn off the control unit, and then turn it on again. If the error still persists, contact your authorized NSK dealer.
ERROR 1	24 V voltage abnormality	
ERROR 2	12 V voltage abnormality	
ERROR 3	Pump current abnormality	Check the connection of the irrigation pump. If the error still persists, contact your authorized NSK dealer.
ERROR 4	Air pressure abnormality	Check the incoming air pressure. If the error still persists, contact your authorized NSK dealer.
ERROR 5	Heater voltage abnormality	Turn off the control unit, and then turn it on again. If the error still persists, contact your authorized NSK dealer.
ERROR 6	Heater current abnormality	
ERROR 7	Heater temperature abnormality	Check the water circuit, and then supply the control unit with water. Cool down the control unit, and then operate it again. If the error still persists, contact your authorized NSK dealer.
ERROR 8	Foot control communication abnormality	Check the connection of the foot control. If the error still persists, contact your authorized NSK dealer.
ERROR 9	Ultrasonic handpiece abnormality	Check the connection of the ultrasonic handpiece. If the error still persists, contact your authorized NSK dealer.
ERROR 10	Air proportional control valve current abnormality	Turn off the control unit, and then turn it on again. If the error still persists, contact your authorized NSK dealer.
ERROR 12	Touch sensor communication abnormality	
ERROR 13	Ultrasonic unit self-check error	
ERROR 14	Ultrasonic unit system error	

8.3 Problems and solutions

■ Ultrasonic mode and powder mode

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 an authorized NSK dealer.

* Cannot be fixed at dental clinics. Be sure to contact your authorized NSK dealer.

Problem	Cause	Remedy
The screen does not display anything even when the power switch is turned on.	The plug is improperly inserted to power source.	Check to make sure that the plug is properly connected.
	Malfunction of the power switch.	Contact your authorized NSK dealer*.
	The fuse has blown.	Contact your authorized NSK dealer*.
A beep sounds.	Power was turned on while the foot control was depressed.	Release the foot control and turn the power switch on.
	Abnormal heating of the control unit.	Stop the operation and wait until the control unit cools down.
Touch panel does not react well, or the touched key is not recognized correctly.	Calibration is slightly misaligned due to static electricity, exogenous noise, etc.	Turn the power switch off and then on.
	The key was not touched at the center.	Touch the center of the key.
	Malfunction of the control unit.	Contact your authorized NSK dealer*.
Water does not stop. The water level cannot be adjusted.	Water volume adjustment dial has been damaged.	Contact your authorized NSK dealer*.
	Damage or wear of an O-ring.	Replace the O-ring with a new one. => "6.1.5 Chamber connector"
	The water circuit has been clogged with foreign materials.	Perform auto-cleaning. If the symptom is still not resolved, contact your authorized NSK dealer.
There is no warm water.	Malfunction of the control unit.	Contact your authorized NSK dealer*.
	Water temperature setting is "OFF".	Set warm water to "ON". => "7.3.2 Setting warm water"
Water is leaking from the bottle connector or irrigation bottle.	Bottle lid is not tightened firmly.	Firmly tighten the bottle lid.
	Worn O-ring or gasket of the bottle lid.	Replace the O-ring or gasket with a new one.
	Irrigation bottle is not inserted all the way. (There is a gap between the irrigation bottle and the control unit.)	Insert the irrigation bottle all the way. Make sure that there is no gap between the irrigation bottle and the control unit.

Problem	Cause	Remedy
After the power is turned on, "CONNECT" or "PUSH FC" is displayed and the screen does not change.	The foot control could not be connected.	<p>Perform the following steps.</p> <ol style="list-style-type: none"> 1. When "PUSH FC" is displayed on the LCD, depress and hold the ON/OFF button of the foot control. If the screen does not change after five minutes, touch . 2. Replace the batteries with new ones. 3. Depress and hold the ON/OFF button of the foot control. If the screen does not change after five minutes, pair the control unit and the foot control again. => "7.3.1 Pairing/unpairing foot control". If the screen does not change after performing the steps 1 through 3, contact your authorized NSK dealer.
The product does not operate even when the ON/OFF button of the foot control is depressed.	The foot control has not been connected.	<p>Perform the following steps.</p> <ol style="list-style-type: none"> 1. Remove any obstructions between the control unit and the foot control (which may be blocking communication). 2. Turn off the power switch, and then turn it on again. 3. Replace the batteries of the foot control with new ones. 4. Pair the control unit and the foot control. => "7.3.1 Pairing/unpairing foot control" 5. If the foot control cannot connect with the control unit after performing the steps 1 through 4, contact your authorized NSK dealer.*
	Poor response of foot control buttons due to long periods of inactivity.	Perform calibration of the foot control. => "7.3.8 Foot control calibration"
	Malfunction of the control unit or foot control.	<p>Perform the following steps.</p> <ol style="list-style-type: none"> 1. Replace the batteries of the foot control with new ones. 2. Pair the control unit and the foot control. => "7.3.1 Pairing/unpairing foot control" 3. Depress the ON/OFF button of the foot control to confirm that the product is operating. <p>If the product does not operate after performing the steps 1 through 3, repairs are required. Contact your authorized NSK dealer*.</p>

8 Troubleshooting

Problem	Cause	Remedy
The product operates although the ON/OFF button of the foot control is not depressed.	Malfunction of the control unit.	Contact your authorized NSK dealer*.
The product does not stop although you lift your foot off the ON/OFF button.		
"COM ERROR" is shown on the display.	The foot control has not been connected.	<p>Perform the following steps.</p> <ol style="list-style-type: none"> 1. Touch  to cancel the error. 2. Remove any obstructions between the control unit and the foot control (which may be blocking communication). 3. Wait for the foot control to be automatically connected. If it is not automatically connected, perform the following procedure: <ol style="list-style-type: none"> 1. Replace the batteries of the foot control with new ones. 2. Pair the control unit and the foot control. => "7.3.1 Pairing/unpairing foot control" 3. Depress the ON/OFF button of the foot control to confirm that the product is operating. If the error persists after performing the steps 1 through 3, repairs are required. Contact your authorized NSK dealer*.
"BATTERY" is shown on the display.	The batteries of the foot control are running down.	<p>Perform the following steps.</p> <ol style="list-style-type: none"> 1. Depress the ON/OFF button of the foot control or touch  to cancel the "BATTERY" indication. 2. Replace the batteries of the foot control with new ones. If the "BATTERY" indication does not disappear after performing the steps 1 through 2, repairs are required. Contact your authorized NSK dealer*.

■ Ultrasonic mode

Problem	Cause	Remedy
Beeps sound, and the ultrasonic mode display (P/E/G) and  flash alternately when the foot control button is depressed.	The sensor built inside the ultrasonic handpiece holder is soiled and mistakenly detects mounting of the ultrasonic handpiece.	Wipe off soil from the sensor built inside the ultrasonic handpiece holder.

Problem	Cause	Remedy
There is no vibration or the vibration is poor.	The AC power cord plug is not connected to the wall socket, or electricity is not supplied to the wall socket.	Check the connection.
	The fuse has blown.	Contact your authorized NSK dealer*.
	The tip is not tightened firmly.	Re-tighten the tip with the tip wrench by rotating the tip wrench until it makes a click sound and cannot rotate any further. If the problem still persists, replace the tip wrench as it may be worn out.
	The tip is worn.	Replace the tip with a new one.
	The threads of the ultrasonic handpiece and tip are not clean.	Wipe them clean.
	The threads of the ultrasonic handpiece are worn out as a result of long term use.	Contact your authorized NSK dealer*.
	Power has not been correctly adjusted for the tip.	Adjust the power so that it does not exceed the set upper limit value mentioned in the supplied operation manual of the tip. => "1.2 Related manuals"
	The foot control has not been connected.	Pair the control unit and the foot control. => "7.3.1 Pairing/unpairing foot control"
	Failure of the vibration device in the ultrasonic handpiece.	Contact your authorized NSK dealer*.
	Failure of internal components of the foot control.	Wipe the sensor clean.
	The sensor built into the ultrasonic handpiece holder is dirty and mistakenly detects mounting of the ultrasonic handpiece.	
The tip is bent or broken.	Power has not been correctly adjusted for the tip.	Adjust the power so that it does not exceed the set upper limit value mentioned in the supplied operation manual of the tip. => "1.2 Related manuals"
The tip falls off.	The tip is not tightened firmly.	Re-tighten the tip with the tip wrench by rotating the tip wrench until it makes a click sound and cannot rotate any further. If the problem still persists, replace the tip wrench as it may be worn out.

8 Troubleshooting

Problem	Cause	Remedy
The ultrasonic handpiece produces a loud noise.	Power has not been correctly adjusted for the tip.	Adjust the power so that it does not exceed the set upper limit value mentioned in the supplied operation manual of the tip. => "1.2 Related manuals"
	The tip is not tightened firmly.	Re-tighten the tip with the tip wrench by rotating the tip wrench until it makes a click sound and cannot rotate any further. If the problem still persists, replace the tip wrench as it may be worn out.
	Failure of the ultrasonic handpiece vibration device or control units internal components.	Contact your authorized NSK dealer*.
The ultrasonic handpiece is overheating.	Power has not been correctly adjusted for the tip.	Re-tighten the tip with the tip wrench by rotating the tip wrench until it makes a click sound and cannot rotate any further. If the problem still persists, replace the tip wrench as it may be worn out.
	The tip is not tightened firmly.	Wipe them clean.
	The threads of the ultrasonic handpiece and tip are not clean.	Contact your authorized NSK dealer.
	The threads of the ultrasonic handpiece are worn out as a result of long term use.	Contact your authorized NSK dealer.
	The irrigation level is insufficient or irrigation has stopped.	Irrigate at an adequate volume.
	Failure of the ultrasonic handpiece vibration device or control units internal components.	Contact your authorized NSK dealer.
No irrigation supply and/or unstable irrigation supply. (When using the bottle)	The pump tube of the irrigation pump is twisted.	Straighten the twisted irrigation tube.
	It is time to replace the irrigation pump. (When using the bottle)	Replace the irrigation pump with a new one. => "6.2 Replacing the pump"
No or poor water supply. (When using tap water)	Water is not supplied to the control unit.	Check the water circuit so that water is supplied to the control unit. Supply water pressure: 0.1-0.3 MPa
	The irrigation level has not been adjusted.	Adjust the irrigation level by rotating the water volume adjustment knob. => "When using tap water" in "3.13.1 Setting irrigation mode".
	Water supply is sometimes unstable when the irrigation level is insufficient.	This is not a malfunction. Adjust the irrigation level by rotating the water volume adjustment knob. => "When using tap water" in "3.13.1 Setting irrigation mode".
	The water filter is clogged with foreign substances.	Replace the water filter with a new one. => "6.3 Replacing the water filter"
Water leaks.	The water hose is not inserted into the water hose connector correctly.	Insert the water hose into the water hose connector fully and firmly. => "3.3 Connecting water hose"

Problem	Cause	Remedy
Ultrasonic handpiece LED does not light.	The O-ring of the connection part between the ultrasonic handpiece and handpiece cord is damaged or worn.	Replace the O-ring with a new one. => "6.1.1 Handpiece cord"
	Failure in the control unit or handpiece cord.	Contact your authorized NSK dealer*.
	The glass rod of the ultrasonic handpiece is damaged as a result of a long term use.	

■ Powder mode

Problem	Cause	Remedy
Alarms sound, and  and  (tooth icon) flash alternately when the foot control ON/OFF button or operation mode/rinse button is depressed.	The sensor built inside the powder handpiece holder is dirty and mistakenly detects mounting of the powder handpiece.	Wipe off soil from the sensor built inside the powder handpiece holder.
	The chamber is not attached securely.	Attach the chamber securely until you hear a click sound. =>"3.9 Attaching and removing chamber"
No notification sound, or the prophy mode () or perio mode () is not displayed even when the chamber is attached.	Failure in the control unit (broken wire) Damage to the sensor built into the chamber.	Contact your authorized NSK dealer*.

8 Troubleshooting

Problem	Cause	Remedy
Air and powder are not supplied, or air and powder are supplied but the pressure is not strong enough and cleaning power is also weak.	Nozzle is deformed or damaged.	Replace the nozzle with a new one. => "4.2.3 Operation" - "■ Attaching nozzle".
	The inside of the nozzle tip is clogged with powder.	Replace the nozzle tip with a new one. => "4.2.3.2 Using in perio mode" - "■ Using nozzle tip".
	The inside of the powder handpiece is clogged with powder.	Perform the following steps. 1. Clean the nozzle base with the supplied cleaning wire (S). 2. Clean the nozzle end with the supplied cleaning file. 3. Clean the inside of the powder handpiece with the cleaning wire (L). If powder and air do not flow after the cleaning described above, perform ultrasonic cleaning with warm water. => "5.8 Ultrasonic cleaning (weekly)"
	The inside of the handpiece hose is clogged with powder.	Remove powder from the handpiece hose. => "6.6 Maintaining handpiece hose"
	The inside of the chamber is clogged with powder.	Remove powder from the chamber. => "5.5.1 Removing powder"
	Powder has partially solidified with water, etc., in the air passage.	Remove powder from the air passage. => "5.2.1 Ultrasonic"
	Powder container has been left open exposing powder to the air.	Dispose of the powder and use new powder.
Water leaks from between the powder handpiece and handpiece hose.	Water is mixed in supply air.	Open the filter in the air supply circuit to drain the compressor, and check that water has not accumulated inside the air filter and compressor drain.
	The element has been clogged.	Contact your authorized NSK dealer*.
Air leaks from between the chamber lid and the chamber.	The O-ring is scratched.	Perform the following steps. 1. Replace the O-ring of the handpiece side connector of the handpiece hose. 2. Apply a drop of the supplied lubrication oil and rub it in with your finger. => "6.1.2 Handpiece hose (Prophy-Hose2/Perio-Hose2)"
The chamber lid cannot be tightened.	Powder adheres to the threads of the chamber and/or the chamber lid.	Clean the threads of the chamber lid. => "5.5.3 Cleaning chamber lid"

9 Spare Parts and Option List

Model	REF	Remarks
Prophy Kit2	Y1500469	Powder handpiece (for prophy use) Prophy-Chamber2 Prophy-Hose2 FLASH pearl
Perio Kit2	Y1500470	Powder handpiece (for perio use) Perio-Chamber2 Perio-Hose2 Perio Mate Powder Perio Mate Nozzle Tip (40 pcs.) Nozzle tip remover
Powder handpiece (for prophy use)	T1074001	Prophy-Handpiece
Prophy-Hose2	TA23120001	
Prophy-Chamber2	UA14220001	
Powder handpiece (for perio use)	T1077001	Perio-Handpiece
Perio-Hose2	TA23160001	
Perio-Chamber2	UA14230001	
FC-83	ZF16020001	Wireless foot control
Irrigation bottle set	UA14240001	400 mL, for Varios Combi Pro2
CLM bottle set	UA14300001	400 mL
VA2-LUX-HP Ti	EA1203X050	Ultrasonic handpiece
VA2-LUX-SC Ti	EA1416X061	Ultrasonic handpiece cord
Air hose	UA14210250	3.6 m
Water hose	UA14210227	3.6 m
CLM holder	ZA00950103	
Bottle lid	UA14240101	For irrigation bottle/CLM bottle
Irrigation bottle	UA14240100	400 mL, bottle, bottle only
CLM bottle	UA14300100	400 mL, bottle, bottle only
Chamber lid	UA14220117	Lid only, for prophy and perio
Irrigation pump	U1135079	
Water filter	U387042	
Water filter case	UA14210259	For water filter
Nozzle (for prophy use)	T1074012	
Nozzle (for perio use)	T1077012	
Jet nozzle (for perio use)	TA10770106	
FLASH pearl	Y900693	100 sachets
FLASH pearl	Y900698	Bottles (4 x 300g), for prophy
SOFT pearl	Y1500721	Bottles (4 x 250g), for prophy
Perio Mate Powder	Y900938	Bottles (4 x 160g), for perio

9 Spare Parts and Option List

Model	REF	Remarks
Perio Mate Nozzle Tip	Y1002741	For perio
Nozzle tip remover	T1043751	For perio
Spanner wrench (12x14)	K133751	For water filter
Cleaning wire (L)	T798091	For inside the powder handpiece
Cleaning wire (S)	T798095	For the root of the nozzle
Cleaning file	T798092	For the distal end and inside the nozzle
Cleaning brush	T798093	
Ring wrench	T1074601	For Varios Combi Pro/Varios Combi Pro2
O-ring set (handpiece hose chamber side/chamber)	Y1500741	For Varios Combi Pro2
O-ring set (handpiece hose handpiece side)	Y1003500	
O-ring set (nozzle)	Y1003501	
O-ring	Y1500961	For Varios Combi Pro2 irrigation bottle and CLM bottle lid
Gasket	Y1500962	For Varios Combi Pro2 irrigation bottle and CLM bottle lid
O-ring	Y1003546	For ultrasonic handpiece cord
O-ring set (chamber joint)	Y1500398	For Varios Combi Pro2 chamber joint
Lubrication oil	Z016112	
CR-10	Z221076	Tip wrench
CLA-10	ZA11900102	Cleaning adapter (for Varios2 handpiece)
CLA-20	ZA11900108	Cleaning adapter (for Varios Combi Pro2 powder handpiece)
CLM Module set	Y1500740	For prophy chamber and perio chamber
CLM Prophy attachment	ZA16130114	For prophy
CLM Perio attachment	ZA16130116	For perio
O-ring set (CLM Module)	Y1500750	
Cable cover	ZA16140124	
b.clean	BCL600	Solution used in CLM mode

10 Specification

10.1 System specifications

■ Control unit

Model	NE355
Power source	AC 220 - 240 V 50/60 Hz
Power input	950 VA
Drive frequency (ultrasonic)	28 - 32 kHz
Maximum output (ultrasonic)	11 W
Air consumption	Prophy mode: OFF, 11.5 - 15 L/min (MAX) Perio mode: OFF, 9 - 12.5 L/min (MAX)
Supply air pressure	0.45-0.75 MPa (4.5-7.5 kgf/cm ²)
Supply water pressure	0.1-0.3 MPa
Bottle volume	400 ±50 mL
Dimensions	W 249 x D 290 x H 115 mm
Weight	3.5 kg

■ Foot control

Model	FC-83
Dimensions	W 260 x D 185 x H 155 mm (including hanger)
Weight	0.7 kg (including hanger)

■ Ultrasonic handpiece

Model	VA2-LUX-HP Ti
Type of oscillation	Piezo type
Light	White LED
Dimensions	Ø 20 x L 103 mm
Weight	58 g (cord not included)

■ Ultrasonic handpiece cord

Model	VA2-LUX-SC Ti
Cord length	L 1,770 mm
Dimensions	Ø 19.9 (handpiece side) x Ø 14.5 (control unit side) mm
Weight	75 g

■ Powder handpiece

Model	Powder handpiece (for Prophy use)
Dimensions	Ø 16 x L 107 mm
Weight	33 g (hose not included)

■ Powder handpiece hose

Model	Prophy-Hose2
Hose length	L 1,900 mm
Dimensions	Ø 16.0 (handpiece side) x Ø 17.9 (chamber side) mm
Weight	107 g

10.2 Bluetooth specifications

Frequency band	2.4 GHz ISM band (2.402 - 2.480 GHz)
Transmitting power	Class3 1 mW
Modulation	GFSK
Channels	40 channels with 2 MHz spacing
Compatibility	EN 300 328, EN 300 489 - 1, EN 301 489 - 17, EN 62479:2010

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■ Use, transportation and storage environment

	Temperature	Humidity	Atmospheric pressure
Use Environment			-
Transportation and Storage Environment			

- * No moisture condensation in the control unit.
- * Using this product outside these limits may cause malfunction.
- * Max. operating altitude: 2,000 m

10.3 Classification of equipment

- Type of protection against electric shock:
 - Class I equipment
- Degree of protection against electric shock:
 - Type B applied part: (Applied parts: ultrasonic tip, ultrasonic handpiece, nozzle tip, and powder handpiece)
- Method of sterilization or disinfection recommended by the manufacturer:
 - Autoclave sterilization
- Degree of protection against ingress of water as detailed in the current edition of IEC 60529:
 - 1) Foot control: IPX1 (Protected against vertically falling water drops)
- Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide:
 - 2) Equipment NOT suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide
- Mode of operation:
 - Non-continuous operation:
ON: 2 minutes OFF: 1 minute

10.4 Operation principle

■ Ultrasonic mode

Electric signals supplied from the control unit are converted into ultrasonic vibrations by the ultrasonic transducer built into the ultrasonic handpiece. These ultrasonic vibrations are transmitted to various tips attached to the end of the ultrasonic handpiece. During treatment, water for cooling and cleaning is supplied from the control unit, delivered through the ultrasonic handpiece and various tips, and used in conjunction with the ultrasonic vibrations.

■ Powder mode

The powder mode includes the prophy mode and perio mode. In the powder mode, a mixture of dental abrasive powder and water, agitated using compressed air within the control unit, is sprayed onto the treatment area. Particularly in perio mode, a specialized nozzle tip is attached to the end of the handpiece to access the periodontal pockets and is used to remove accretions and deposits from the tooth surface.

11 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.		
Guidance on electromagnetic emissions and manufacturer's declaration.		
Emissions test	Compliance	Electromagnetic environment - guidance
Radiated emissions CISPR11	Group 1 Class B	The product uses RF energy only for its internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
Conducted emissions CISPR11	Group 1 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 IEC61000-3-2	Class A (Only 220 - 240 V)	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies (Only 220 - 240 V)	
Immunity test	IEC60601-1-2 test level	Compliance level
Electrostatic discharge (ESD) IEC61000-4-2	± 8 kV contact ± 2, 4, 8, 15 kV air	± 8 kV contact ± 2, 4, 8, 15 kV air
Electrical fast transient/burst IEC61000-4-4	± 2 kV for power supply lines 5/5 ns, 100kHz	± 2 kV for power supply lines 5/5 ns, 100kHz
Surge IEC61000-4-5	± 0.5, 1 kV line(s) to line(s) ± 0.5, 1, 2 kV line(s) to earth 1.2/50 µs, 5 points 0, 90, 180, 270°	± 0.5, 1 kV line(s) to line(s) ± 0.5, 1, 2 kV line(s) to earth 1.2/50 µs, 5 points 0, 90, 180, 270°
Voltage dips, short interruptions, and voltage variations on power supply input lines IEC 61000-4-11	0 % Ut for 0.5 cycles @ 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0 % Ut for 1 cycles 70 % Ut for 25/30 cycles 0 % Ut for 250/300 cycles	0 % Ut for 0.5 cycles @ 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0 % Ut for 1 cycles 70 % Ut for 25/30 cycles 0 % Ut for 250/300 cycles
Power frequency (50/60 Hz) magnetic field IEC61000-4-8	30 A/m 50/60 Hz	30 A/m 50/60 Hz
Proximity magnetic field IEC61000-4-39	30 kHz 134.2 kHz (Pulse modulation) 2.1 kHz, 50% Duty, 13.56 MHz (Pulse modulation) 50 kHz 50% Duty	30 kHz 134.2 kHz (Pulse modulation) 2.1 kHz, 50% Duty, 13.56 MHz (Pulse modulation) 50 kHz 50% Duty
NOTE UT is the rated voltage of application.		

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	IEC60601-1-2 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC61000-4-6	3 Vrms(unmodulated) 0.15-80 MHz AM, 1kHz, 80%	3 Vrms(unmodulated) 0.15-80 MHz AM, 1kHz, 80%	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 $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz $d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz 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).
Radiated RF IEC61000-4-3	3 V/m: 80 to 2700 MHz 9 V/m: 710, 745, 780, 5240, 5500, 5785 MHz 10 V/m: 1420, 1428, 1510, 1545 MHz 27 V/m: 385 MHz 28 V/m: 450, 810, 870, 930, 1720, 1845, 1970, 2450 MHz	3 V/m 9 V/m 10 V/m 27 V/m 28 V/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: 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
a: Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and 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.			

11 EMC Information (Electromagnetic Compatibility Information)

Cables and accessories	Maximum length	Shield
AC power cord	2 m, 3m	Unshielded
Handpiece cord (Ultrasonic)	2 m	Unshielded
Foot control	(Radio communication)	

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		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance "d" in 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.

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

NAKANISHI INC.  www.nsk-dental.com
700 Shimohinata, Kanuma, Tochigi 322-8666, Japan

NSK Europe GmbH 
Elly-Beinhorn-Str. 8, 65760 Eschborn, Germany



Visit our
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