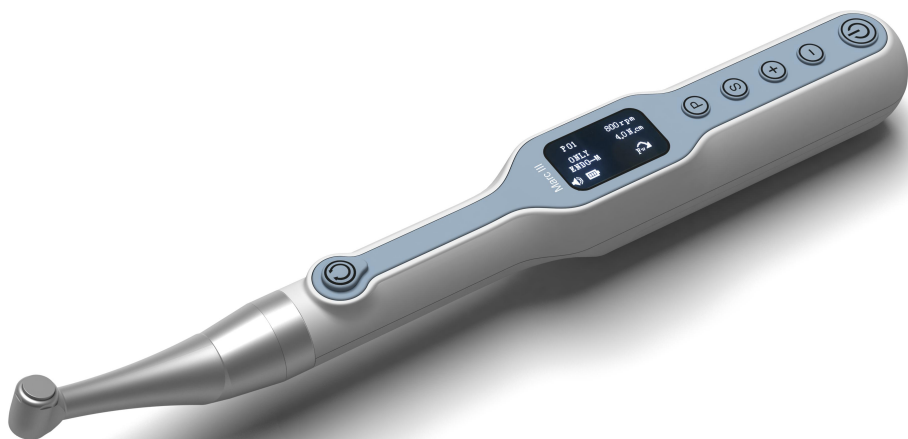




Operation Manual for **Marc III**

Endo motor for root canal preparation



Read this Operation carefully before use.
Keep this Operation Manual for future reference.

Thank you for purchasing the Marc III Motor.

Read this Operation Manual carefully before use for operation instructions and care and maintenance guidelines. Keep this Operation Manual for future reference.

Application

- This product is a cordless handpiece used primarily for root canal enlargement.

Contraindication

- It is prohibited to use in them such as patients with hemophilia or heart disease. Patients and doctors with pacemakers. Pregnant women and young children need to use caution.

User

- This device is only allowed to be used in hospital environments, clinics or dental offices by qualified dentists and other legally licensed professionals. Do not use this device for anything other than its specified dental purpose.

Requirement for the file

- The Dental Electrical Motor connects with the file which must meet the requirements of the type 1 in ISO 1797-1.

Prohibition

- The product cannot be used to expand the grossly twisted root canal;
- The product cannot be used for treatment other than implantation or other root canal therapy;
- Hemophilia patients, patients with pacemakers and doctors are prohibited;
- Patients with heart disease, pregnant women and young children are cautious.

Classification of Devices

Classification by type of protection against electric shock

— Class II devices

Classification by degree of protection against electric shock

— Applied part type B

Classification by sterilization or disinfection method allowed by the manufacturer

— Refer to Sterilization

Classification by mode of operation

— Continuously operating device

Degree of protection against ingress of water: IPX0

Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide: Equipment NOT suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Symbols:



Refer to instruction manual/
booklet



Caution: In case of
application as a safety sign.



Type B APPLIED PART



Class II equipment



Medical device



Serial number



Manufacturer



Date of manufacture



For indoor use



Upward



Keep dry



Fragile, handle with care



CE Marking



Direct current



Authorized representative in the European Community/
European Union



The product complies with the directive on WEEE. This device must
be disposed of as municipal solid waste when abandoned



Washer-disinfector for thermal disinfection



Sterilizable in a steam sterilizer (autoclave) at the temperature
specified

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Cautions 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 and prevent danger and harm to you and others. These are classified by degree of danger, damage and seriousness. All indicators concern safety, therefore always follow them.

Classification	Degree of danger or damage and seriousness
 ANGER	Explains an instruction where death or serious injury may occur.
 ARNING	Explains an instruction where bodily injury or damage to device may occur.
 CAUTION	Explains an instruction where possibility forminor to medium bodily injury or damage to device may exist.
 NOTICE	Explains an instruction that should be observed for safety reasons.
 DANGER	
• Use the specified batteries for this product. Never use any other batteries than United Dental specifies. • This product is designed specifically for use with rechargeable batteries. Do not use manganese or alkaline batteries. Using and charging these by error may cause a liquid leakage or explosion. • High pressure from the outside will cause a liquid leakage or explosion. • Keep the motor and battery away from the fire, otherwise it will cause a liquid leakage or explosion. • Sterilizing the motor by heat or steam may cause a liquid leakage or explosion.	
 WARNING	
• Portable and mobile RF communications equipment can affect Medical Electrical equipment. Do not use RF equipment outskirts for the product. • If the handpiece has not been used for long time, check it before use to perform correctly.	

- Do not handle the power cord with wet hands. Failure to do so may result in an electric shock.
- Keep the handpiece away from water and chemical solution which may cause short circuit, fire and other dangerous.
- Do not disassemble or alter the motor handpiece.
- If there' s liquid leakage on the battery, or handpiece deform or fade, immediately stop using and contact with your dealer.
- Do not charge the handpiece without battery.
- Keep the charging interface away from something conductive such as copper scrap.
- Please use original charger to charge the battery.
- When inserting the motor handpiece into the charger, check that the buzzer sounds and the LED indicate charging (animation for remaining battery capacity). Unless charging is indicated, this function is not performed and burns may result by heat generation or liquid leakage may result, therefore, stop use and contact your dealer.
- The motor handpiece has an electronic circuit (TORQUE LIMITER Function) to prevent files from breaking; however, files may still break due to metal fatigue if the torque is conditioned to be higher. Please check the working instruction of file before use.



CAUTION

- Fully training to use this product to guarantee the safety of patient.
- The product is used for dental treatment only by qualified personnel.
- Do not use a bent, damaged, deformed or non- ISO-conforming file. It may cause personal injury due to sudden breakage or flying off during rotation.
- Do not use or leave the product in a high-temperature environment such as under strong direct sunlight, in a car under a blazing sun, by a fire or near a stove.
- Check the product before use, if there' s abnormal loose, vibration, noise and temperature (heat generation). Immediately stop using and contact with your dealer.
- Keep the handpiece away from dirt, it will affect the concentricity of contra angle and the judgment of the torque.
- Before changing the contra angle or file or Maintenance of motor, turn off the power of the motor.

- Do not lubricate any part of the motor except the contra angle. Only lubricate the head and shank.
- If use corrosive solutions during the operation, please clean the motor handpiece immediately after operation.
- This equipment is for indoor use only.
- Follow the instruction of file manufacture to set the rotation and speed of the motor.



NOTICE

- The motor use the rechargeable li-ion battery.
- The power consumption is low when the power is off, please fully charged after each use, please charge at least 1 time a month if long-term use.
- When the battery is low, the motor automatically shut down, leave it for a while and the motor can be turned on again, but this is not permitted, it may damage and reduce the battery life.
- If the product is not used for a long period, please take the battery out.
- If the power is not left completely, the battery may be damaged, please replace a new one.
- Please read the instruction book for all operation, maintenance and operation information.

1. Features

- Ergonomic design, small size. The max diameter less than 28mm. The head holding part is just 16mm. Therefore dentists can get better sight and more convenient operation.
- Ergonomic design, small size. The max diameter less than 28mm. The head holding part is just 16mm. Therefore dentists can get better sight and more convenient operation.
- “Multi – position type head allows direction of contra angle to be changed easily.
- The OLED panel enhances user friendliness.
- Operates continuously for more than 2 hours (Dependent upon rated load)
- Memory for up to 10 programs. RESET bottom can be used once the error occurs.
- The auto reverse function is activated depending on the comparison between load and set torque. A wide variety of functions such as “AUTO REVERSE”, “REVERSE” and “AUTO RECIPROCATING” are available.
- The motor can be turned on and off by pressing the POWER key.
- The motor softly starts. Since the rotation briefly stops before changing direction there are no vibrations and shocks during the change of directions.
- The motor will be turned into sleeping mode without any action in 10 minutes, click "power" key to wake up.
- The rotating speed and torque can be compensated perfectly by the controlling chip.
- Charging interface is designed as MICRO USB.
- 180 minutes, battery will be fully charged.

2. Specification

Battery Adaptor

Adaptor Mode	BMPA0001
Input Voltage	100–240 ~ 50/60Hz
Input Power	20VA
Output Voltage	DC5V/1A

Motor Handpiece

MODE	Marc III
Input Voltage	DC3.7V
Input Power	Max7VA
Charging Time	Approx.180. min

Use environment

Temperature	10–40℃
Humidity	10–70%
Atmospheric Pressure	700–1060hPa

Store/transport environment

Temperature	–10— 50℃
Humidity	10–80%
Atmospheric pressure	500–1060hPa

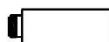
3. Name of each part



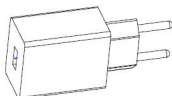
Central Unit



Contra angle



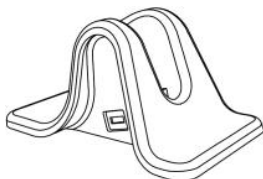
Spray nozzle



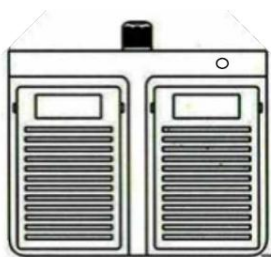
Power Adaptor



USB cord



Battery charger



Wireless Pedal (optional)



Measuring cable C (optional)

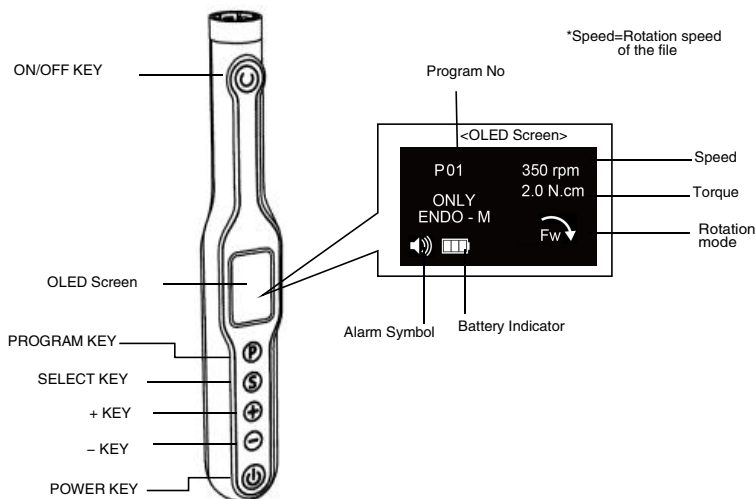
The **Marc III** system is made up of the components listed below:

Components	Type	Number
Motor handpiece	Marc III	1PC
Contra angle	BMCA0004	1PC
Spray nozzle	BMSN0001	1PC
Battery charger	BMBC0001	1PC

Power Adaptor	BMPA0001	1PC
USB cord	BMUC0001	1PC
Operation manual	\	1PC
Wireless Pedal (optional)	BMWP0001	1PC
Measuring cable C (optional)	BMMV3001	1PC

4. Parts and its function

Keypad and Display



POWER Key

- Long press power key to turn on or turn off the motor.

ON/OFF Key

- Normal rotation operation: when the power is on
—Pressing this key to start the motor and pressing this key again to stop the motor.

SELECT Key

- Torque, Rotation mode and other operation setting.
 - 1) Short press this key to set torque, rotation mode, when the machine is on.
 - ◆ To adjust the settings in the select box by “+/-” key, the sequence are as follows “Torque—Rotation mode” , the setting will be saved automatically, to press “P” to exit.
 - 2) Long press this key to start other operation setting, when the machine is on.
 - ◆ To adjust the icon of “Volume—Reciprocating—Bluetooth—Apex Locator Controls Motor—Auto Start & Stop—Factory Default—Left-Hander & Right-Hander—Auto Calibration” by “+/-” key, the settings will be saved automatically, and press “P” to exit.

PROGRAM Key

- A program can be selected from P01–P10.

+/- Key

- Use these keys to increase or reduce the speed of the motor.
- As other function to adjust the value.

OLED screen

Rotation mode

-  : Forward, Rotation is in clockwise motion. When the load is beyond the set torque limit or reach the apical, it will be automatically reverse out, when the load is removed, it will start normal rotation again.

-  : Reverse, Rotation is in anti-clockwise motion.
-  : Optimum Torque Reverse, Rotation is in reciprocating mode.

Battery Symbol

The symbol indicates the battery status. The symbol will be animated when the batteries are being charged or in the refresh mode.

 : About 60–100 % remains.

 : About 30–80 % remains.

 : About 10–40 % remains.

 : About 0–10 % remains. Batteries are drained or in a remarkably low voltage. Charge the batteries.

 : The symbol flashing with alarm. Please turn off the motor, and charge the batteries at once

NOTICE

The symbol indicating the remaining amount of the batteries indicates a voltage. When load is applied to the motor handpiece, the symbol indicating the remaining amount of the battery charge appears to become lower.

Alarm Symbol

 : Max alarm

 : Medium alarm

 : Lower alarm

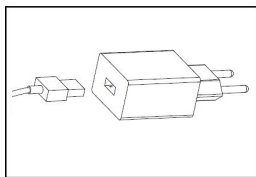
 : OFF

Alarm can be turn off (The details to see 6 Convenient Operation, Alarm Sound Volume Control)

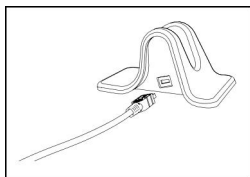
5. Operations

5.1 Charging Battery

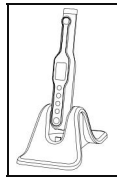
- a) Insert the USB cord into the inlet at the back of the battery charger. (Fig. a)
- b) Insert the USB cord and plug in. Make sure you have the correct model/voltage. (Fig. b)
- c) Turn on the power switch. At this time, check that the power lamp lights up.
- d) Insert the motor handpiece into the battery charge. Charging starts with the charge mark flashing on OLED (Fig. c).
- e) When the buzzer sounds and is displayed on the liquid crystal panel, charging is completed.



(Fig.a)



(Fig.b)



(Fig.c)



NOTICE

The handpiece can be charged directly by USB cord, even there is no USB cord. But please ensure the handpiece be placed in dry condition.



CAUTION

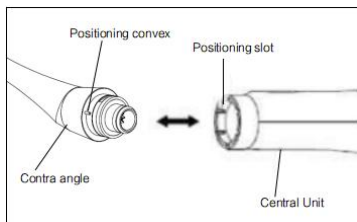
- Please ensure the central unit and the power adapter is placed in dry and clean condition.
- Be careful of handling when placing the motor handpiece into the

charger. Do not put handpiece into the WET or UNSAFE place.

- Never use the power adapter for anything other than this product by manufacturer.
- The charging normally takes approx. 180 minutes, but it depends on battery use conditions, battery freshness, ambient temperature, etc.
- Under the charging condition, the handpiece was not allowed to rotate.
- The completely discharged will cause the damage of the battery. The user should charge the battery completely once a month, or once two months, if the handpiece will not be used for long term.
- Do not put anything (dust, especially the metal debris) other than the handpiece on the charger. Please protect the charger carefully.
- Pull out the machine from the charge base up straightly after the battery fully charged.

5.2 Changing Contra Angle

The contra angle head can be connected with the motor handpiece at 6 adjustable head positions. Align the positioning pins of the contra angle with the positioning slots of the motor handpiece and insert the head until they click. When removing the contra angle head, pull it out axially.



CAUTION

- Turn OFF the power to remove or attach the contra angle.
- Do not use the contra angle from other manufacturer
- Check that the contra angle is securely connected to the motor handpiece.

5.3 Mounting and Removing File

Insert file to contra angle, lightly turn the file until it engages with the latch mechanism. Push it inward to click File Removal, depress the push-key and pull out the file.

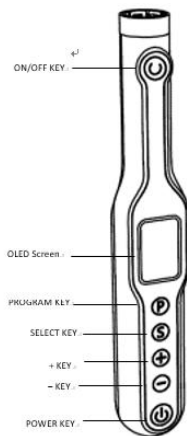


CAUTION

- When attaching and detaching the file, turn off the power beforehand.
- After the file is locked in place, lightly pull out the file to make sure the file is locked.
- Always clean the shank of the file to be installed before use. Allowing dirt to enter the chuck could cause loss of concentricity and deterioration of chucking force.
- Do not exceed the rotation speed recommended by the file manufacturers.

5.4 Preparatory Operations

1. Long press POWER key to turn on the machine.
2. Keep holding down the PROGRAM key until program No. suitable for file to be used is displayed.
3. When changing the set value of torque,



or rotation mode and other operation, press the SELECT key, select the setting item and press the "+/-" key to change.

4. Press the "+/-" key to change the speed.

5.5 Operation

● Endo motor function

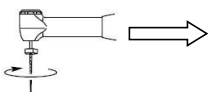
- ◆ User program
- ◆ Forward (Auto reverse)
- ◆ Reverse
- ◆ Optimum Torque Reverse (Reciprocating)

● Rotation mode

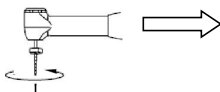


Forward: Rotation is in clockwise motion.

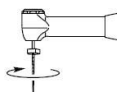
When the load is beyond the set torque limit or reach to the apical, it will be automatically reverse out, when the load is removed, it will start normal rotation again.



Load lower than the set torque limit value



Load higher than the set torque limit value, anti-clockwise



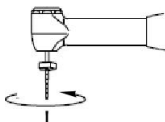
Reverse rotation when load continues or reach to the apical, stop and return to clockwise rotation when load is removed.



Reverse: Rotation is in Anti-clockwise Motion.

In the general condition, when the Endo Motor Rotate in counter-clockwise motion will be claim as reverse motion. The traditional rotary files are drawing from the canal by reverse motion. Therefore, beep sound will occur

when using this function.

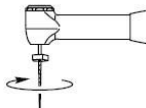
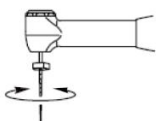


anti-clockwise rotation

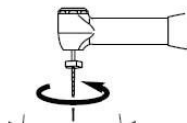


Optimum Torque Reverse: Rotation is in Reciprocating

motion.



or



Load lower than the set torque limit value, clockwise and anticlockwise in turns (reciprocating)

Load higher than the set torque limit value, motor will exit the root canal automatically, the exiting direction is opposite to the direction of reciprocating cutting.



NOTICE

- To set the reciprocating of rotation direction see 6.3 OTR Settings.

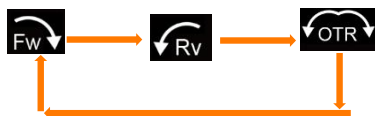


CAUTION

This function is designed specially for the RECIPROCATING ROTARY FILES, the cutting side is on the anticlockwise motion, the clockwise motion is for file to get out. If the load higher than the formatted torque (torque cannot be set), the motor will rotate clockwise continuously to let the file get out the canal. For next time use, only need to press ON/OFF key.

5.6 Rotation Mode setting

- Pressing this SELECT Key to adjust rotation mode in the select box, when the machine is on.
- Enter the Rotation Mode selection: To adjust the rotation mode of Forward (AUTO REVERSE)—REVERSE—Optimum Torque Rotation (RECEPROCATING), in sequence by "+/-" key.
- To press "P" key to quit the setting; and the settings will be saved automatically.



5.7 Speed, Torque Settings

- Start setting: When the machine is on,
 - ◆ Speed: To Press “+/-” key to adjust the speed;
 - ◆ Torque: To short press “S” key, then to adjust the current torque in the select box by “+/-” key
- To press “P” key to quit the setting; and the settings will be saved automatically.



5.8 After use

When the treatment is completed, return the motor handpiece to the handpiece stand and hold down the POWER key for more than one second to turn off the power.

- Auto Power Off

If the key is not operated or approximately 3 minutes passes during rotation with no-load, the power is automatically turned OFF to save energy and

prevent inn proper operation. However, if load is applied during rotation of the motor hand piece, the power is not turned OFF even during.

- **Last Memory**

The last setting used before the power is turned OFF is memorized. The setting when the power is turned ON next is as that immediately used before the power has been turned OFF.

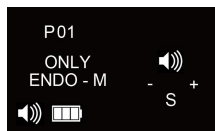
6. Convenient Function

6.1 Program

- The device offers 10 memory program, press “P” key to select different program from P01–P10 in sequence.
- User can set the speed, torque, rotate direction according to personal habits or the order of file.
- All the parameters will be saved automatically.

6.2 Alarm Sound Setting

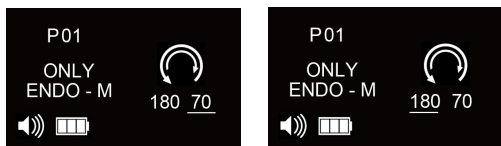
- Long press “S” key, when the machine is on, the screen will display the volume icon.
- To adjust the volume by “+/-” key.
- Long press “S” key or short press “P” key to exit the setting, and all the settings will be saved automatically.



6.3 OTR Settings (Normal reciprocating mode)

- Long press S key to enter the other operation mode, when the machine is on; then keep short press until OTR icon shows on the screen display as in the pictures., short press S key to shift the direction of OTR, adjust the angle data by “+/-” key. The angle difference is no less than 80 degree.

- Long press “S” key or short press “P” key to exit the setting, and all the settings will be saved automatically.



6.4 Wireless Connection Control (Optional)

We designed the product from the point of view of the doctor's use to make the operation easier. When doctors treat the molar, they need to go deep into the mouth, switch the parameter mode manually and press the button on the machine inconveniently. In order to provide more convenient operation for doctors, we also provide an optional wireless control solution.

The device has a built-in wireless transmission module, which can be connected with the wireless pedal control device that assembles the same type of wireless transmission module. The device can be controlled by the device to run, stop, forward and reverse (see the pedal instructions for the operation of connecting with the wireless pedal control device).

The device wireless transmission connection settings:

- Wireless transmission display features on and off. Long press “S” key to enter into other operation mode, short press “S” until the Bluetooth icon shows, press “+/-” to select “Bluetooth turn on” or “Bluetooth turn off” .
- When Bluetooth turn on, the Bluetooth icon shows, when connected, the display as follows:





CAUTION

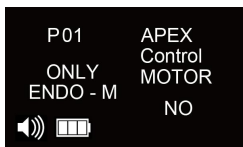
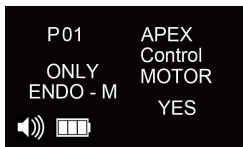
- This wireless transmission module is one-to-one connection and does not support one-to-many connection, that is, one module can only connect with one product.
- When multiple devices automatically connected at the same time, there may be a connection error. Please connect one by one as required
- Wireless transmission function automatically save once start, factory setting this function is off.

6.5 Apex Locator Controls Motor (Optional)

In order to provide doctors with more convenient operation, using a measuring cable, the device can connect with the apex locator to realize the apex locator controls motor.

The device Operation Settings of Apex Locator Controls Motor:

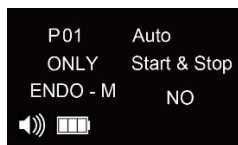
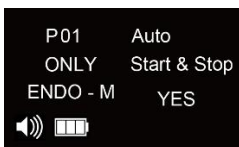
- In the startup state, long press “S” to enter other setting modes, short press “S” until entering Apex Locator Controls Motor Mode “Apex Control MOTOR” , and press “+/-” to select “yes” or “no” .
- Long press “S” key or short press “P” key to exit the setting, and all the settings will be saved automatically.



6.6 Setting of Auto Start/Stop function

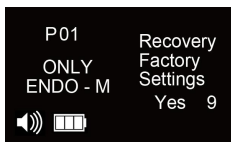
In the mode of Apex locator control motor, the rotation will auto start when file tip enters root canal (and auto stop when taken out from root canal). User can turn on/off the function according to the need by following steps.

- When the device is on, long press “S” to enter background settings. Short press “S” and switch to “Auto Start & Stop” as shown below.
- Press “+” to switch between YES and NO to turn ON and turn OFF the function
- Press “P” to save and quit.



6.7 Factory Default Parameters

- Long press " S " to enter other operation mode, short press" S " key until it turns into" Recovery Factory Settings". Then select “yes” by pressing "+", counting from “9” to “0” , automatically shut down and complete the Factory settings.
- If the value "0" has not been reached, press the "P" key to exit the setting and give up restoring to the factory settings.



CAUTION

If this function is used, all programs will disappear and return to the originally set values. Record the present program details if required before you carry out this operation.

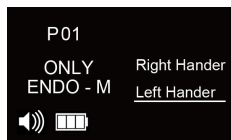
6.8 Left–hander & Right–hander setting

The program is applicable to Left–hander & Right–hander user.

- When the device is on, Long press “S” key to enter into other operation settings, short press “S” key until in to Left–hander &

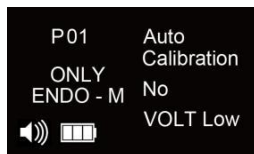
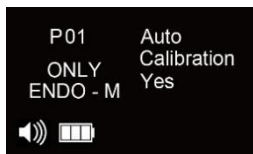
Right-hander option, adjust by “+/-” key;

- To press “P” key to quit the setting; and the settings will be saved automatically.

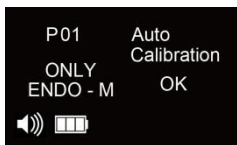
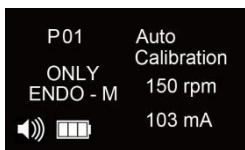


6.9 Auto Calibration

- Install the fully lubricated contra angle on the central unit and place it on a flat platform.
- When the device is on, Long press “S” key to enter into other operation settings, short press “S” key until in to Auto Calibration. As shown in the figure below, when "yes" is displayed (if the battery is insufficient, it will display “NO VOLT Low” , it should be fully charged until it displays “yes”), press “+” to enter the automatic calibration mode;



- During the calibration process, the root canal preparation machine rotates with the decelerating machine, please do not touch it, and wait for the automatic operation to complete;
- After the calibration is completed, it will display "OK" as shown in the figure below, and it will automatically shut down and complete the automatic calibration;



- To press “P” key to quit the setting; and the settings will be saved automatically.

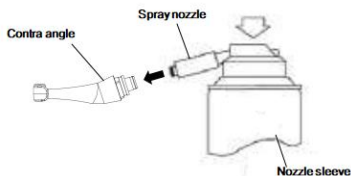


CAUTION:

- Before calibrating, you need to display "yes", that is, the battery must have sufficient power. It is recommended to calibrate after fully charged;
- Before calibration, be sure to clean the contra angle first, because if there are residual impurities in the process of use into the contra angle, the calibration will cause deviation.
- When calibrating, please don't bring file or any load on the contra angle.
- Do not shake the motor during calibration.

7. Maintenance

- Insert the spray nozzle into the contra angle head (insert to the part connect to the main unit).
- Insert the lubricants spray nozzle to the provided spray nozzle loop, inject the lubricants for 2–3 seconds till the outlet liquid from the head of the contra angle clean.



1. Lubricating Contra Angle

- Use qualified SPRAY to lubricate or sterilization.
- Lubricate the contra angle only.
- Apply SPRAY/SPRAY Plus after each use and/or before each calibration and autoclaving.

2. Cleaning the Motor Handpiece

- Wipe it off with a cotton cloth moistened with alcohol.

3. Cleaning the Metal holder

- Wipe it off with a cotton cloth moistened with alcohol.



WARNING

Do not lubricate the motor handpiece or the Metal holder.

- Before mounting the lubricated contra angle to the motor handpiece, wipe off excess oil. Stand it on its end or lean it in the proper position for gravity draining. Mount it after excess oil has been completely drained.
- Hold the contra angle securely to prevent it from flying off by the pressure of the spray.
- Hold the SPRAY (option) upright.
- When cleaning the motor headpiece, do not use any solvent such as benzene and thinner.

8. Cleaning 、 Disinfection 、 Sterilization



CAUTION:

- No part of the device was sterilized before leaving the factory.



WARNING:

- Do not immerse the central unit in the ultrasonic cleaner.
- Do not use liquid or spray cleaner directly, especially on the screen.
- Except the contra angle, all other parts for the device can't be sterilized by high temperature and pressure. See the following table for the cleaning methods of other parts
- Do not use any heat, radiation, formaldehyde, ethylene oxide or plasma for sterilization.

**Advice:**

- Reprocessing procedures have only limited implications to this dental instruments. The limitation of the numbers of reprocessing procedures is therefore determined by the function / wear of the device. From the processing side there is no maximum number of allowable reprocessing. The device should no longer be reused in case of signs of material degradation.
- In case of damage the device should be reprocessed before sending back to the manufacturer for repair.

Reprocessing Instructions

Step	Parameter
Preparation at the Point of Use:	Remove gross soiling of the instrument with cold water (<40°C) immediately after use. Don' t use a fixating detergent or hot water (>40°C) as this can cause the fixation of residuals which may influence the result of the reprocessing process. Store the instruments in a humid surrounding, if required.
Transportation:	Safe storage and transportation to the reprocessing area to avoid any damage and contamination to the environment.
Preparation for Decontamination:	The devices must be reprocessed in a disassembled state, as far as possible. Only contra angle can be cleaned and disinfected with automated methods and sterilized with steam sterilization process. Do not sterilize the Central Unit , power adapter, USB cord! The Central Unit , power adapter and USB cord cannot be cleaned and disinfected in a washer/disinfector! For these parts, only a general wipe decontamination is possible!
Decontamination of other parts than Contra angle:	After operation, take the Central Unit , power adapter and USB cord on the workbench. Soak a soft cloth completely with distilled water or deionized water, and wipe all the surfaces of these components, until the surface of the components is visually clean.

	For decontamination, soak a dry soft cloth with 75% alcohol or other disinfectants which are approved for its efficacy by VAH/DGHM–listing, CE marking, FDA and Health Canada Approval. Wipe all surfaces of the Central Unit , adapter and other components with the wet soft cloth for about 3 minutes. Please follow the instructions of manufacturer of disinfectants. Wipe the surface of the component with a dry soft lint-free cloth.
Following instructions are only relevant for contra angle!	
Pre-Cleaning of Contra angle:	Not use automated cleaning, disinfection and sterilization for other parts than contra angle in this system! Do a manual pre-cleaning, until the instruments are visually clean. Submerge the instruments in a cleaning solution and flush the lumens with a water jet pistol with cold tap water for at least 10 seconds. Clean the surfaces with a soft bristle brush.
Cleaning:	Regarding cleaning/disinfection, rinsing and drying, it is to distinguish between manual and automated reprocessing methods. Preference is to be given to automated reprocessing methods, especially due to the better standardizing potential and industrial safety. Automated Cleaning: Use a washer-disinfector meeting the requirements of the ISO 15883 series. Put the instrument into the machine on a tray. Connect the instrument with the WD by using suitable adapter and start the program: ● 4 min pre-washing with cold water (<40°C); ● emptying ● 5 min washing with a mild alkaline cleaner at 55°C ● emptying

	● 3 min neutralising with warm water (>40°C); ● emptying ● 5 min intermediate rinsing with warm water (>40°C) ● Emptying <i>The automated cleaning processes have been validated by using 0.5% neodisher MediClean forte (Dr. Weigert).</i> Note Acc. to EN ISO 17664 no manual reprocessing methods are required for these devices. If a manual reprocessing method has to be used, please validate it prior to use.
Disinfection:	Automated thermal disinfection in washer/disinfector under consideration of national requirements in regards to A0 value (see EN 15883). A disinfection cycle of 5 min disinfection at 90°C has been validated for the device to achieve an A0 value of > 3000. Here we suggest a disinfection cycle of 5 min disinfection time at 93 °C.
Drying:	Automated Drying: Drying of outside of instrument through drying cycle of washer/disinfector. If needed, additional manual drying can be performed through lint free towel. Insufflate cavities of instruments by using sterile compressed air.
Functional Testing, Maintenance:	Visual inspection for cleanliness of the instruments and reassembling, if required. Functional testing according to instructions of use. If necessary, perform reprocessing process again until instrument is visibly clean. Before packaging and autoclaving, make sure that these devices have been maintained acc. to manufacturer's instruction.
Packaging:	Pack the instruments in an appropriate packaging material for sterilization. The packaging material and system refer to EN ISO 11607.

Sterilization:	Sterilization of instruments by applying a fractionated pre-vacuum steam sterilization process (according to EN 285/EN 13060/EN ISO 17665) under consideration of the respective country requirements. Minimum requirements: 3 min at 134°C (in EU: 5 min at 134°C) Maximum sterilization temperature: 137°C Drying time: For steam sterilization, we recommend a drying time of 15 to 40 minutes. Choose a suitable drying time, depending on the autoclave and load. Refer to the autoclave's instructions for use. After sterilization: - Remove the product from the autoclave. - Let the product cool down at room temperature for at least 30 minutes. Do not use additional cooling. Check that the sterilization wraps or pouches are not damaged. Flash sterilization is not allowed on lumen instruments!
Storage:	Storage of sterilized instruments in a dry, clean and dust free environment at modest temperatures, refer to label and instructions for use.
It is the duty of the user to ensure that the reprocessing processes including resources, materials and personnel are capable to reach the required results. State of the art and often national law requiring these processes and included resources to be validated and maintained properly.	

9. Changing Battery

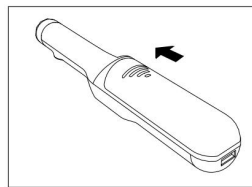
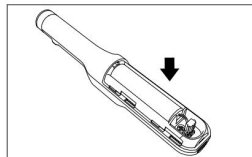
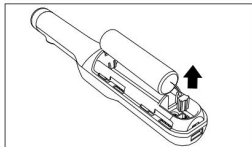
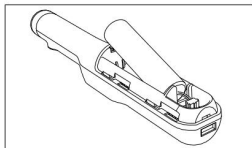
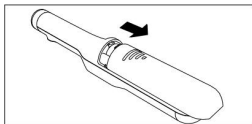
The motor handpiece uses rechargeable battery. They can be recharged more than 300 times, depending on the use conditions of the motor handpiece.

- “MEMORY EFFECT” is not applicable in li-ion battery. Recharge can be conduct anytime.
- 300 times is the minimum workable recharging times, which will not affect battery life.
- Elements affect battery life:
 - ◆ Not in use for a long term. We recommend at least recharge 1 time a month.
 - ◆ Do not recharge the battery, when the room temperature over 30 centigrade.



CAUTION:

- Do not open any part other than the battery cover.
- Use only batteries as specified by Manufacturer.
- Designated Battery: 14500 cylinder shaper LI- ION battery, nominal 3.7 V
- Charging with these battery may cause damage
- Once found the battery fluid leak, please stop using at once.
- Do not use any wet cloth, alcohol or other chemistry to wipe the surface of the battery.
- Do not work with wet hands. Failure to do so may result in rust formation on battery, or cause the fire.
- Should the battery fluid leak and get into your eyes, immediately wash with clean water and ask for medical care.



Changing Battery

1) Remove the battery cover by sliding it toward the arrow

2) Pull out the battery a little part, and then separate the cable from handpiece by hand carefully.

3) Replace with new battery.

4) Close the battery cover

Slide the cover from the button to the top with a little force by the finger

10. Troubleshooting

If something goes wrong, please check the following again before consulting your dealer. If none of these is applicable or the trouble is not remedied even after action has been taken, a failure of this product is suspected. Contact your dealer, do not field-repairable.

Problem	Cause	Solution
The power is unable to turn on.	Battery has run out.	Recharge the battery.
	No battery inserted.	Insert battery.
	The internal fuse has burnt.	Contact your dealer.
Charge failure	Battery has been over used	Replace with new battery.
	The power cord plug is not inserted into the charger base well	plug the power cord or adaptor properly
	The handpiece is not correctly match to the charger base	Reload the handpiece to get a good match
	There is some residual Contamination on the charger base	remove the residual contamination
	Nothing is displayed on the panel of the handpiece even when it is loaded to the charger	Contact your dealer.
	The charger base is broken	Charge the motor by cable, then contact your dealer
The motor hand piece	The contra angle has been blocked	Clean or reset the contra angle
The alarm sounds when the motor is working	The contra angle head has jammed up.	Clean the contra angle
Contra rotation failure	set to Auto Reverse mode, take off contra angle, there is NO click sound when working	Contact your dealer.
	set to Auto Reverse mode, take off contra angle, there is click sound	Clean the contra angle
The alarm sounds when the motor is working.	There is some residual contamination on the rotating shaft of the contra angle	Clean the contra angle

11. Warranty

Manufacturer warrants its products to the original purchaser against defects in material and workmanship under normal practices of installation, use and servicing. Batteries etc., are disposable components, and are not covered by this warranty.

Manufacture's information can be found in warranty card.

12. Disposing Product

- Please consult with the dealer from whom you purchased regarding waste disposal.
- The used Li-ion batteries are recyclable, but their disposal may sometimes not be permitted by the respective country. Return them to your dealer.

13. Electromagnetic emissions and immunity

The appliance is intended for use in the electromagnetic environment specified below. The user of the device should assure that it is used in such an environment.

Guidance and manufacturer's declaration — electromagnetic emissions		
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.		
Emission test	Conformity	Emission test Conformity Electromagnetic Environment – guidance
RF Emissions CISPR 1	Group 1	The appliance use RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The device is suitable for use in at I establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF Emissions CI SPR 1	Class B	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Conforms	

Guidance and manufacturer's declaration — electromagnetic emissions			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance Level	Electromagnetic environment – guide
Electrostatic discharge(ESD) EN 61000-4-2	± 6kV contact ± 8kV air	± 6kV contact ± 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst, IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/ Output lines	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line to line ± 2 kV line to earth	± 1 kV line to line	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short Interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5%UT (>95% dip in UT For 0.5 cycles 40% UT (60% dip in UT) for 5 cycles <5%UT 70% UT (30% dip in UT) for 25 cycles <5%UT (>95% dip in UT) for 5 s	<5%UT (>95% dip in UT For 0.5 cycles 40% UT (60% dip in UT) for 5 cycles <5%UT 70% UT (30% dip in UT) for 25 cycles <5%UT (>95% dip in UT) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: UT is the ac. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration — electromagnetic emissions			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that is used in such an environment.			
Immunity test	level EN 60601-1-2	Compliance Level	Electromagnetic environment – guide
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80 \text{ MHz} \sim 800 \text{ MHz}$ $d = 2.3\sqrt{P} \quad 800 \text{ MHz} \sim 2.5 \text{ GHz}$ 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). Field strengths from fixed RF transmitters as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. 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 device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the device. b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Guidance and manufacturer's declaration – electromagnetic emissions					
The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF according to the maximum output power of the communications equipment.					
Rated maximum output power of transmitter Watts [W]	Separation distance according to frequency of transmitter (in meters) Meters [m]				
	150 kHz	80 MHz	80 MHz	800 MHz	800 MHz 2.5 GHz
	$d = 1.2\sqrt{P}$		$d = 1.2\sqrt{P}$		$d = 2.3\sqrt{P}$
0.01	0.12		0.12		0.23
0.1	0.38		0.38		0.73
1	1.2		1.2		2.3
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 separation distance for the higher frequency range applies.					
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.					

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Warranty Card

Dear user:

For the warranty:

1. We offer 1 year warranty for the product Marc III (excluding the battery and accessories).
2. The following circumstance does not belong to the scope of free warranty:
 - a) Using the product did not follow the matters needing attentions in user`s manual;
 - b) Disassembling the product by yourself;
 - c) Altering the invoice or without the invoice.
3. Fill up the following information, then send it back to us with our products.

User' s Name: _____ **Telephone Number:** _____

Address: _____

Trouble Description:

(The information such as: When, Where and How it happened. How many times)

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