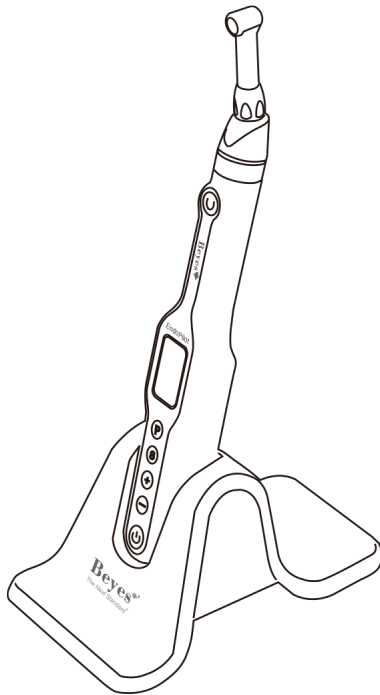


# EndoPilot

Cordless Endodontic Handpiece

## Instruction for Use



**Beyes**<sup>®</sup>  
The Next Standard

Thank you for purchasing EndoPilot.

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

## **Application**

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

## **Caution**

Do not use with patients with hemophilia or heart disease, Patients and doctors with pacemakers; Pregnant women and young children need to use caution.

## **User**

Only qualified personnel are allowed to use the unit only for dentistry.

## **Prohibition**

- Do not use this motor handpiece for formation of an extremely bent root canal.
- Do not use this for implants other than endodontic treatment or other dental treatment.

## **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: IPXO**

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

## Symbols


 This conforms to CE European Directive of "Medical equipment directive 93/42/EEC."

 Follow the waste of electric and electronic equipment (WEEE) Directive (2002/96/CE) to dispose of the product and accessories.

 Class II equipment

 Type B conforming component

 Refer to the Operation Manual

 Consult accompanying documents (user manual)

 Manufacturer







 Authorized representative in the European Community

## Table of Contents

Cautions for handling and operation.....	5-6
1. Features .....	7
2. Specification .....	8-9
3. Name of each part.....	9
4. Parts and its function.....	10-12
5. Operations.....	13-19
6. Convenient Function .....	19-21
7. Cleaning .....	22
8. Sterilization.....	23
9. Changing Battery.....	24
10. Error Code.....	25
11. Troubleshooting.....	25-26
12. Warranty.....	27
13. Disposing Product .....	27
14. Electromagnetic emissions and immunity .....	27-31
15. Warranty Card.....	31

## Cautions for handling and operation

- Read these safety cautions thoroughly before use of the product.
- 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
 DANGER	Explains an instruction where death or serious injury may occur.
 WARNING	Explains an instruction where bodily injury or damage to device may occur.
 CAUTION	Explains an instruction where possibility for minor to medium bodily injury or damage to device may exist.
 NOTICE	Explains an instruction that should be observed for safety reasons.
 DANGER	
<ul style="list-style-type: none"><li>• Use the specified batteries for this product. Never use any other batteries than United Dental specifies.</li><li>• 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.</li><li>• High pressure from the outside will cause a liquid leakage or explosion.</li><li>• Keep the motor and battery away from fire, otherwise it will cause a liquid leakage or explosion.</li><li>• Sterilizing the motor by heat or steam may cause a liquid leakage or explosion.</li></ul>	
 WARNING	
<ul style="list-style-type: none"><li>• Portable and mobile RF communications equipment can affect the device.</li><li>• Medical Electrical equipment. Do not use RF equipment outskirts for the product.</li><li>• If the handpiece has not been used for long time, check it before use.</li><li>• keep your hands dry when operating or connecting the charger base.</li><li>• keep the handpiece away from water and chemical solutions which may cause short circuit, fire and other dangers.</li><li>• Do not disassemble the motor handpiece. The motor cannot be modified.</li><li>• If there's liquid leakage on the battery, or handpiece deformation or fade, immediately stop using and contact your dealer.</li><li>• Do not charge the handpiece without the battery in place.</li></ul>	

- Keep the charging interface away from something conductive such as copper scrap.
- Please use original charger to charge the battery.
- Connect the handpiece to the charger base, the handpiece LED will indicate the charging state, if not, please refer to the trouble shooting.
- There's an electronic circuit which controls the torque (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 familiarize yourself with 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.
- Check the product before use, if there's abnormal loose, vibration, noise and temperature (heat generation). Immediately stop using and contact your dealer.
- Keep the handpiece away from dirt, it will affect the concentricity of the contra angle and the judgment of the torque.
- Before changing the contra angle, file or performing maintenance of motor, turn off the power of the motor.
- Do not lubricate any part of the motor except the contra angle.
- If using corrosive solutions during the operation, please clean the motor handpiece immediately after operation.
- This equipment is for indoor use only.
- Follow the instructions of the file manufacturer to set the rotation and speed of the motor.

 NOTICE

- The motor uses a rechargeable li-ion battery.
- The power consumption is low when the power is off, please fully charged after each use, please charge at least once a month if long-term use.
- When the battery is low, the motor will automatically shut down. Make sure to charge it fully.
- If the product is not used for a long period, please take the battery out.
- Please read the instructions before operating and maintenance of this unit.

## 1. Features

- Ergonomic design, small size. The max diameter less than 28mm. The head of the unit 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 LCD panel enhances user friendliness.
- Operates continuously for more than 2 hours (Dependent upon rated load).
- Memory stores up to 5 programs. RESET button can be used if an 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" , "AUTO STOP" , "AUTO REVERSE OFF" , "REVERSE" and "AUTO RECIPROCATING" are available.
- The motor can be turned on and off by pressing the ON/OFF key. Alternatively, the unit can be operated by holding down the ON/OFF key during operation and letting go of the ON/OFF key to stop the handpiece.
- 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 go into sleep mode after 10 minutes of inactivity, 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.
- The battery will be fully charged after 90 minutes.
- The contra angle provided for this product can be autoclaved at 135°C (excluding the motor).

## 2. Specification

### Battery Adaptor

Adaptor Mode	G DP06AH-0500500- EU
Input Voltage	100-240 - 50/60Hz 0.25A
Input Power	2.5vA
Output Voltage	DC5V/0. 5A

### Motor Handpiece

MODE	EndoPilot
Input Voltage	DC3.7V
Input Power	Max7VA
Charging Time	Approx.90. min

### Use environment

Temperature	10-40 °C
Humidity	10-70%(Non condensing)
Atmospheric Pressure	1060hPa

### Store/transport environment

Temperature	-10- 50'
Humidity	10-80%(Non condensing)
Atmospheric pressure	500-1060hPa

## Performance

### Torque

Gear	Min Torque(N.CM)	Max Torque(N.CM)
4:1	0.1	0.7
10:1	0.2	2.0
16:1	0.3	3.0
20:1	0.4	4.0



## Rotation speed

Gear	Min Rotation speed(rpm)	Max Rotation speed(rpm)
4:1	500	2250
10:1	200	900
16:1	140	550
20:1	100	450

## 3. Name of each part



Motor handpiece



16:1 contra angle  
(ALP101)



Silicone Sleeve  
(ALP 119)



Spray nozzle  
(ALP 111)



Charging base  
(ALP 121)



Adaptor  
(ALP 107)

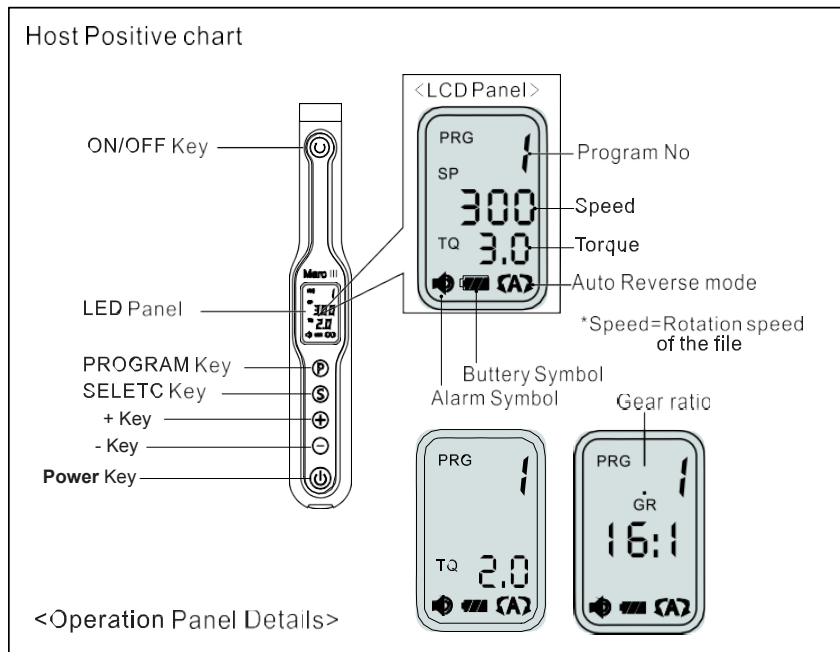


Battery  
(ALP 104)



Charging wire  
(ALP 108)

## 4. Parts and its function



### POWER Key (⏻)

- Holding down the POWER key for more than one second turns on the power and the LCD panel lights up.
- Holding down the POWER key for more than one second while the power is on turns off the power and the LCD display turns off.

### ON/OFF (⏻)

- Pressing this switch, when the power is on, rotates the motor handpiece, and de-pressing the switch again stops the hand piece. (Normal rotation operation)  
Pressing and holding the switch for approx. one second or longer rotates the motor handpiece and releasing the switch stops the handpiece. (Temporary rotation operation)

**SELECT Key (S)** (When the motor is running, the key is invalid)

- Press the SELECT key to cycle through "speed, torque or gear ratio setting", or "Rotation Mode selection".
- Press the SELECT key, the panel will display "speed, torque or gear ratio setting".
- Enter "speed, torque or gear ratio setting" to make changes to the related setting. By the sequence of SPEED - GEAR RATIO - TORQUE - EXIT, in a cycle; adjust the value by pressing + or -.
- Press "P" for a couple of seconds to remember the setting, for future use.
- To quit the "speed, torque or gear ratio setting":
  - 1, press "S" when setting torque;
  - 2, Press "S" for a couple of seconds;
  - 3, press ON/OFF.
- "P" or operation to quit.
- Pressing and holding this SELECT Key for 1 second or longer, when the motor is stopped can change the Rotation Mode.
- Enter the Rotation Mode selection: the sequence will be, AUTO REVERSE - AUTO STOP - AUTO REVERSE OFF - REVERSE - RECEPTION, in a cycle: adjust the value by pressing + or -.
- Press "P" a couple of seconds to remember the setting, for future use.
- To quit the "Rotation Mode selection":
  - 1, Press "S";
  - 2, press ON/OFF or, P to quit.

**PROGRAM Key (P)** (When the motor is running, the key is invalid)






- A preset program can be selected. The present program number is displayed on the panel. There are 5 programs available, numbered from 1 to 5.
- Up to five programs can be set, and program settings can be memorized by pressing this key for one second or longer.
- The following parameters can be set: Speed, torque, gear ratio and auto reverse setting.

**+/- Key (+/-)**

- Use this key when adjusting the torque.
- Use with other functions to adjust the values.






## LCD panel

### Auto Reverse

-  : If the load is removed after auto reverse rotation, it returns to the normal rotation again.
-  : If the load is removed after auto reverse rotation, it stops.
-  : Auto reverse rotation is not activated. (There will be no symbol displayed)
-  : rotation is in anti-clockwise motion.
-  : rotate as reciprocating mode, ""REC"" displayed.

### Battery Symbol




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

-  : Full charge or nearly full charge
-  : About 30-80 % remains
-  : Less than about 30% 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.

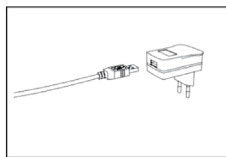
-  : Max alarm
-  : Lower alarm
-  : OFF

Alarm can be turn off (Refer to 6 Convenient Operation, Alarm Sound Volume Control)

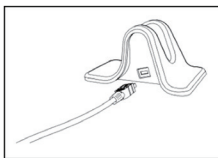
## 5. Operations

### 5.1 Charging Batteries

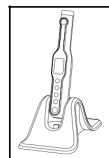
1. Insert the power cord jack into the inlet in the back of the battery charger.  
(Fig. a)
2. Insert the power cord and plug in. Make sure you have the correct model/voltage.  
(Fig. b)
3. Turn on the power switch. Check that the power lamp lights up.
4. Insert the motor handpiece into the battery charge. Charging starts with the charge mark flashing on LCD. (Fig. c)
5. 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 cable, even there is no power cord. Ensure the handpiece is placed in a dry environment.

#### Warning



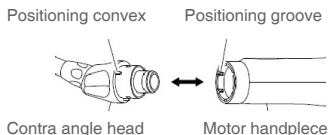
When the buzzer does not sound and the charging animation is not displayed, please remove the handpiece, check the "ERROR, CODE" to find out the problem.

## CAUTION

- ⚠ • When the power lamp for the charger does not light up, the internal fuse may be faulty. In this case please contact your dealer.
- Be careful when placing the motor handpiece into the charger. Do not put handpiece into the WET or UNSAFE place.
- Never use a battery charger from other manufacturers.
- The charging normally takes approx. 90 minutes, but it depends on battery use conditions, battery freshness, ambient temperature, etc.
- The handpiece will not rotate when being charged.
- Letting the battery completely discharge can cause damage to it. The user should charge the battery completely once a month, or bi-monthly, 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.
- After the battery is fully charged. Remove the handpiece by pulling it up off the base, not forward or backward.
- The battery may not charge if:  
Lower than approx. 0° C or higher than approx. 40° C  
Battery voltage is sufficient  
Battery voltage is ab normal

## 5.2 Changing Contra Angle

The contra angle 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 manufacturers.
- 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.

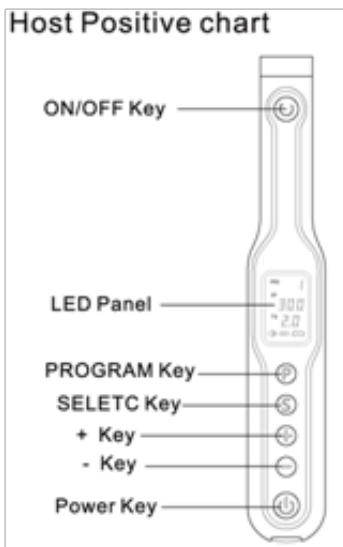


#### CAUTION

- ⚠ • When attaching and detaching the file, turn off the power beforehand.
- After the file is locked in place, lightly pull 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. Hold down the POWER key for more than one second to turn on the power.
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 speed, torque, gear ratio or auto reverse, press the SELECT key, select the setting item and press the +/- key to change.








## 5.5 Operation

If you press the ON/OFF key briefly, the motor handpiece starts. If you re-press the key, it stops. (Alternate operation) If you hold down the ON/OFF key for more than one second, the motor handpiece starts while the key is pressed. If you release the key it stops. (Intermittent operation).

### Auto Reverse Function

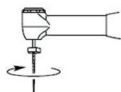
Auto reverse setting can be changed by pressing the SELECT key for one second or longer while the motor handpiece stops. As the auto reverse mark flashes while the SELECT key is kept pressed, press the +/- key to adjust it.

-  : Auto Reverse
-  : Auto Stop
-  : Auto Reverse OFF
-  : REVERSE
-  : RECIPROCATING

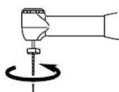
The alarm will sound when it becomes a value of half of a torque limit set up during motor handpiece rotation, and the alarm will change near the torque limit value. Motor will turn to other mode, which according to the value of the load.

### Auto Reverse

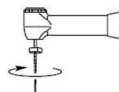
When it continues applying a load and it exceeds the torque limit value, it will automatically turn to AUTO REVERSE mode, the file will rotate in reverse.



Load lower than the set torque limit value



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

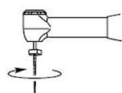


Reverse rotation when load continues, stop and return to clockwise rotation when load is moved.

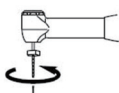


## A Auto Stop

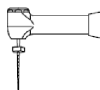
The motor hand piece starts in reverse. When a load is removed, the motor handpiece stops. If you want (forward rotate) again, re-press the ON/OFF Key or re-step.



Load lower than the set torque limit value



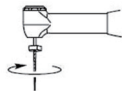
Load higher than the set torque limit value, counter-clockwise



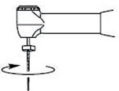
Stop, when the reverse finished

## No Display Auto Reverse Off

The motor handpiece stops without reverse rotation. If you want it to rotate (forward-rotate) again, re-press the ON/OFF Key or re-step.



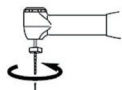
Load lower than the set torque limit value



Load higher than the set torque limit value, handpiece stopped

## Reverse

In the general condition, when the Endo Motor Rotates in counter-clockwise motion will be claim as reverse motion. the traditional rotary files withdrawing from the canal by reverse motion. Therefore, beep sound will occur when using this function.



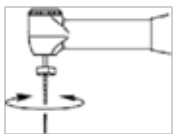
Counter-clockwise rotation

### Notice

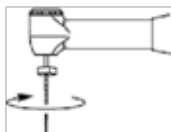
There will be no TORQUE CONTROL when the motor is in counter-clockwise rotation.

## ↶↷ Reciprocating

While in reciprocating mode, the motor will alternate between clockwise and counter-clockwise rotation. When the load become higher than the set torque limit. The motor will turn to counter-clockwise rotation and a beep will sound.



Load lower than the set torque  
Limit value, counter-clockwise and  
Clockwise in turns (reciprocating)



load higher than the set torque  
limit value, counter-clockwise rotation  
with ) alarm warning sound

### Notice



- Under the RECIPROCATING mode, only 16:1 or 20: 1 is supported. The setting must be the same as the actual contra angle handpiece.
- Speed, Torque cannot be set or displayed.

### Caution



This function is designed specially for the RECIPROCATING ROTARY FILES, the cutting side is on the counter-clockwise motion, the clockwise motion is for file to get out. If the load is 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 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 pressed or approximately 10 minutes passes during rotation with no-load, the power will automatically turn OFF to save energy and prevent improper operation. However, if load is applied during rotation of the motor hand piece, the power will remain ON.

- **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

You can change any preset values and have them memorized to your desired settings (rotation speed, torque limit value, gear ratio and auto reverse mode).

1. Press the PROGRAM key until it cycles to the program number which you want to have memorized (up to 5 programs).
2. Adjust the rotation speed, torque limit value, gear ratio and auto reverse mode by +/- key according to your needs.
3. Hold down the PROGRAM key for more than one second. When the alarm sounds the settings have been memorized.

#### Notice

- ⚠ The program cannot be memorized while the motor handpiece is in motion.
- The program is not memorized unless the PROGRAM key is held down for more than one second.
- If the program number is changed by the PROGRAM key, the initially memorized preset values will be replaced.

## 6.2 Initialization of Program (Factory-set configuration)

The program can be reverted to the original factory settings if needed.

1. Turn off the power, if the power is on.
2. Press PROGRAM, and then press the POWER key for more than one second. Release the keys when the LCD panel indicates "REC".
3. Re-press the PROGRAM key more than 1 second, release the key when display shows "FIN".
4. after the long beep, reset success.

### Caution



If you perform a factory reset, make sure to record your program settings so that you can restore them after completing the factory reset if needed.

## 6.3 Calibration

This function is to decrease fluctuation in the rotation speed of the motor handpiece and the difference in torque by the contra angle.

1. Lubricate the contra angle head. (Refer to the "7 (1) Lubricating Contra Angle.")
2. Turn off the power. (If the motor power is on)
3. Press PROGRAM, and press the POWER key for more than one second. Release the keys when the LCD panel indicates "REC". And then press "+" key three times.
4. The LCD panel displays "CAL" with the alarm sound. Attach the lubricated contra angle to the motor.
5. Put the handpiece into the charger, and then press ON/OFF key.
6. If the motor handpiece begins to rotate, leave it as it is until it stops.
7. This process ends, if the rotation stops and the LCD panel display returns to its original state.
8. If you want to stop this process, turn off the power key for more than 1 second.

## Caution

- ⚠ • This function does not work unless remaining battery capacity is sufficient.
- Perform calibration after cleaning the contra angle. Residuals will affect the calibration.
- Do not attach any rotary files or other when calibration.
- Do not shake the motor when calibration is in progress.
- This function can achieve the perfect balance between the handpiece with contra angle. However, cannot match to more than 1 different contra angle.

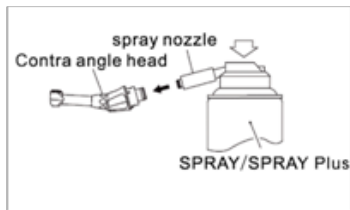
## 6.4 Alarm sound setting

You can turn ON/OFF the alarm (load alarm) which sounds when the torque limit value is reached.

1. Turn off the power.
2. Press the S key, and then keep pressing the POWER key for one second or longer. Release the keys when The alarm mark and ON or OFF on the LCD panel, and the sound volume changes.
3. Press the SELECT key to select OFF, MEDIUM or MAX for alarm sound.
4. Press POWER key to set to memory, or the motor will re- start after 5 seconds, if there is no operation.
5. Display on the LCD returns to the original state if no operation is performed for a while.

## 7. Cleaning Maintenance

- Insert the spray nozzle into the contra angle head (insert into bottom of contra angle.)
- Insert the lubricant spray nozzle into the provided spray nozzle loop, inject the lubricants for 2-3 seconds till the liquid coming from the head of the contra angle is clean.



### 7.1 Lubricating Contra Angle

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

### 7.2 Cleaning the Motor Handpiece

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

### 7.3 Cleaning charger

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

### Warning

- ⚠ • Do not lubricate the motor handpiece or the charger.
- 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 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. Sterilization

- Sterilize the contra angle only.
- For the sterilization method, we recommend autoclaving.
- Autoclave sterilization required after each patient as noted below:
  - a) Brush the dirt off the surface of the contra angle, and wipe it off with a cotton cloth moistened with surgical spirit. Do not use a metal brush.
  - b) Lubricate the head with the SPRAY/SPRAY Plus. (Refer to the "7 (1) Lubricating Contra Angle.")
  - c) Insert the head into an autoclave pouch and seal it.
  - d) Autoclavable up to a max. 135°C (275° F). ex. Autoclave for 20 min. at 121° C (250° F), or 15 min. at 132° C (270° F).
  - e) Keep the handpiece in the autoclave pouch to keep it clean until you use it.

\*Sterilization at 121°C for more than 15 minutes is recommended by EN 13060 or EN554.

### Caution

-  Do not heat sterilize the motor handpiece.
- Do not wipe with not clean or immerse in high acid water or sterilizing solutions.

## 9. Changing Batteries

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

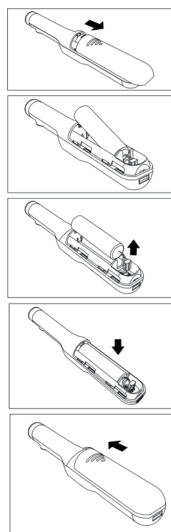
- "MEMORY EFFECT" is not applicable in li-ion battery. Recharge can be conducted anytime.
- 300 times is the minimum workable recharging times, which will not affect battery life.
- Elements that can affect battery life:
  - a) Not in use for a long time. We recommend at least recharge 1 time a month.
  - b) 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 specified by UNITED DENTAL.
- Designated Battery: 14500 cylinder shaper LI- ION battery, nominal 3.7 V.
- Charging with non designated batteries may cause damage.
- If you see battery fluid leakage, please stop using at once.
- Do not use any wet cloth, alcohol or other chemical 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 a fire.
- Should the battery fluid leak and get into your eyes, immediately wash with clean water and seek for medical care.

### Change battery

1. Remove the battery cover by sliding it toward the arrow.
2. Pull out the battery slightly, 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 bottom to the top with a little force with your finger.





## 10. Error Code

	Error ode	Error	Cause	Check Remedy
When working	E-0	Self-Check error	Malfunction of circuit	Contact your dealer
	E-1	Overcurrent	The motor handpiece is locked. (auto reverse mode)	Remove payload
	E-2	Overvoltage	Malfunction of circuit	Contact your dealer
When Charging	E-3	Charger failure	Malfunction of circuit	Contact your dealer
	E-4	Low voltage of battery	Battery out of service	Chang Battery
	E-5	High voltage of battery	Battery out of service	Chang Battery
	E-8	Low voltage of adaptor	Battery out of service	Change adaptor
	E-9	High voltage of adaptor	Battery out of service	Change adaptor
When calibration	E-7	Calibration failure	Motor damaged or handpiece blocked	Replace the motor handpiece or motor

## 11. 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 attempt to field-repair.

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
	An error code is displayed.	Refer to No. 10 Error Code.
	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 does not rotate.	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.	
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

## 12. 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.

## 13. Disposing Product


- Please consult with the dealer from whom you purchased regarding waste disposal.
- Please use the spare part specified by the manufacturer, unspecified spare part such as adapter and cord may cause the system radiation increased or the interference reduced.
- The used Li-ion batteries are recyclable, but their disposal may sometimes not be permitted by the respective country. Return them to your dealer.

## 14. Electromagnetic

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 EndoPilot is intended for use in the electromagnetic environment specified below. The customer or the user of the EndoPilot should assure that 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.
RF Emissions CI SPR 1	Class B	The EndoPilot 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.
Harmonic emissions IEC61000-3-2	Class A	
Voltage Fluctuations/ flicker emissions IEC 61000-3-3	Conform s	

Guidance and manufacturer's declaration - electromagnetic emissions			
The EndoPilot is intended for use in the electromagnetic environment specified below. The customer or the user of the EndoPilot should assure that is used in such an environment.			
Immunity test	IEC60601 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 < 5 % UT ( > 95 % dip in UT) for 5 s	< 5 % UT ( > 95 % dip in UT 400/UT ( 60 % dip in UT) for 5 cycles < 5 % UT 70 % UT ( 30 % dip in UT) for 25 cycles < 5 % UT < 5 % UT ( > 95 % dip in UT for 5s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the EndoPilot requires continued operation during power mains interruptions, it is recommended that the EndoPilot 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 EndoPilot is intended for use in the electromagnetic customer or the user of the EndoPilot should assure that environment specified below. The is used in such an environment.			
Immunity test	IEC60601 test level	Compliance Level	Electromagnetic environment - guide
Conducted RF IEC 61000-4-6 Radiated 3RF IEC 61000-4-	3 Vrms 150 kHz to 3V/m 80 MHz to	3 Vrms 3V/m	<p>Portable and mobile RF communications equipment should be used no closer to any part of the EndoPilot, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance</p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <math display="block">d = 1.2\sqrt{P}</math> </div> <div style="margin-right: 10px;">80 MHz</div> <div style="margin-right: 10px;">800 MHz</div> </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <math display="block">d = 1.2\sqrt{P}</math> </div> <div style="margin-right: 10px;">800 MHz~2.5 G Hz</div> </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <math display="block">d = 2.3\sqrt{P}</math> </div> </div> <p>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:</p> <div style="text-align: center;">  </div>
NOTE 1 : At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 : These guidelines may not apply in at I 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/ cord less) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast can not 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 EndoPilot is used exceeds the applicable RF compliance level above, the EndoPilot should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the EndoPilot . 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 EndoPilot is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the EndoPilot 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	0.23
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.			

## 15. Warranty Card

- The main engine of Cordless Endodontic Micro motor (including Motor Handpiece and Contra Angle Handpiece) enjoy one year free warranty.
- The following circumstance does not belong to the scope of free warranty:
  - Using the product did not follow the matters needing attentions in user's manual;
  - Disassembling the product by yourself;
  - Altering the invoice or without the invoice.
- 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)

# Beyes<sup>®</sup>

*The Next Standard*



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