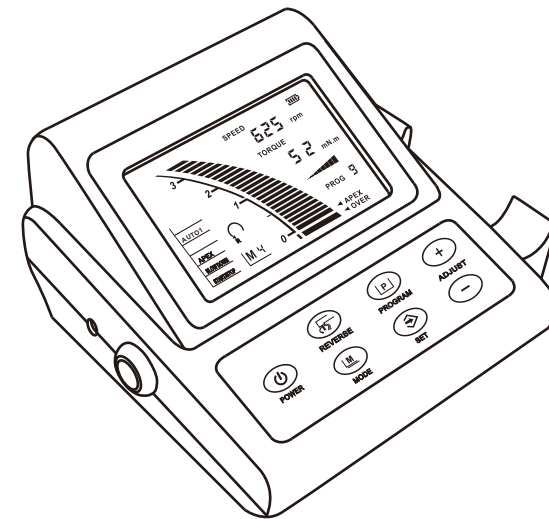


ENDODONTIC TREATMENT INSTRUMENT

USERS GUIDE

C-SMART-I+



Ver1.1 Revision Date:2015-06-24

CE 0482

Safety caution

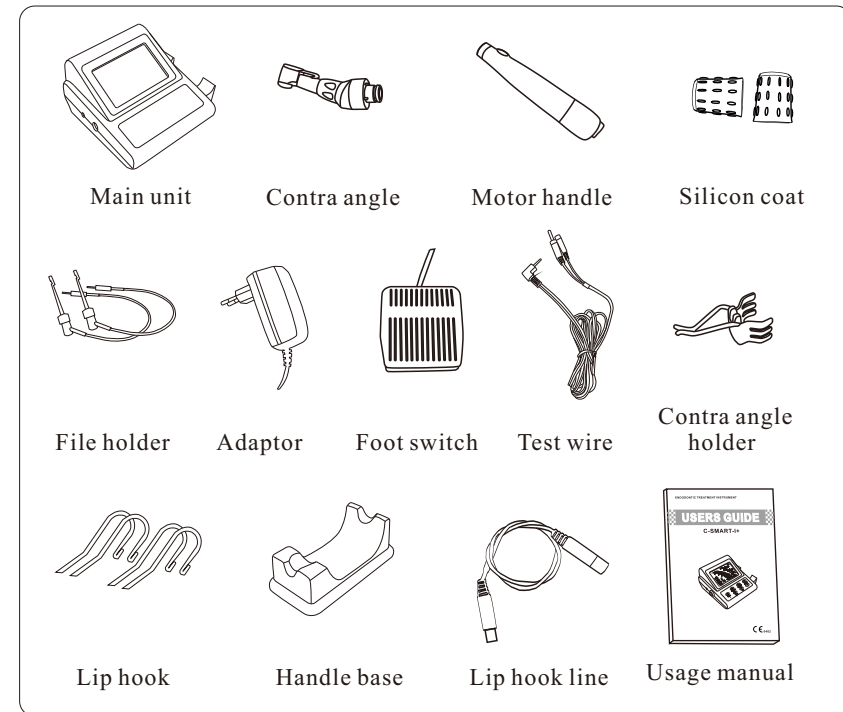


CAUTION:
Please read the following information completely before use this product.

1. This unit must be used as the user's guide mentions, not for other purpose. Please refer to the usage instruction strictly. We won't take the responsibility for the damage caused by improper use.
2. Before using the main power, make sure the power voltage is according to adaptor voltage range. Improper input voltage will damage the unit and cause danger to operator or patient.
3. Please use the original accessories, such as: contra angle, adaptor, and battery. We won't take the responsibility to any problem or damage caused by using other parts which are not supplied by us.
4. To avoid electric shock, don't insert any other parts into the unit; it may cause electric shock or damage.
5. Avoid the detergent go into the unit, in case that causes the short circuit or problem.
6. Please turn off the instrument at once when something wrong with it. It's not allowed to modify the unit at any condition. Any disassembling or modification will cause the invalidation of the guarantee.
7. Please use the intact standard file. Or it would cause damage to the patient while working.
8. Protect the instrument from ambient electromagnetic interference. When there is a patient who is using the cardiac pacemaker, or there is an electronic operation, please don't put the machine around.
9. Unstable voltage and being under electromagnetic environment will interfere with the normal operation.
10. When discard the accessories, please abide with the local regulation, if necessary, contact our service centre to recover it.
11. This unit is just for the professional user.

Standard configuration

Main unit	1
Contra angle	1
Motor handle	1
Silicon coat	2
File holder	2
Adaptor	1
Foot switch	1
Test wire	1
Contra angle holder	1
Lip hook	4
Handle base	1
Lip hook line	1
Usage manual	1
Torque card	1

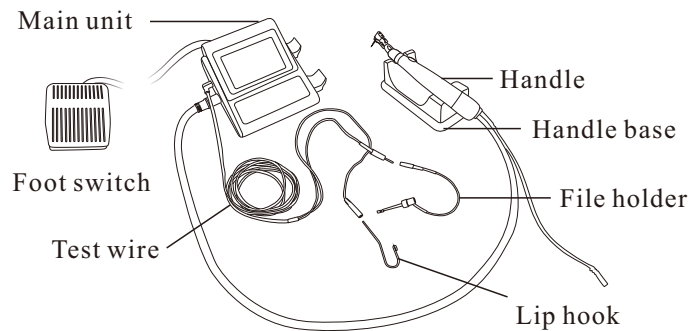


Intended use

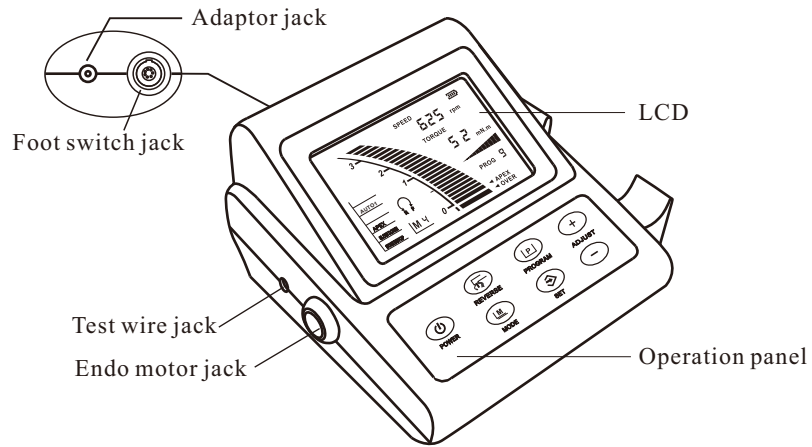
The unit is the supplementary root-canal treatment device, which can assist the dentists to operate more standard root-canal in the process of root-canal treatment.

Construction and installation

This product is consist of main unit, foot switch, test wire, handle, file holder, lip hook, handle base and so on.

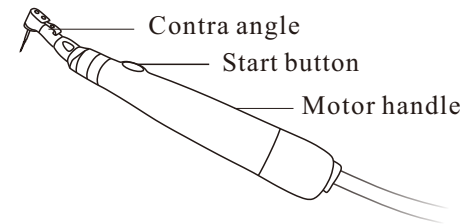


Structure and theory — main unit

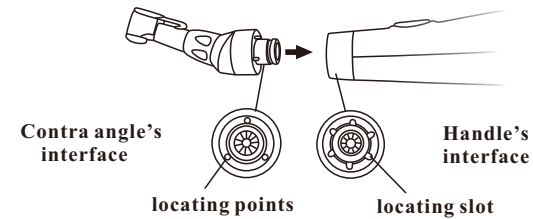


3

Structure and theory — motor handle

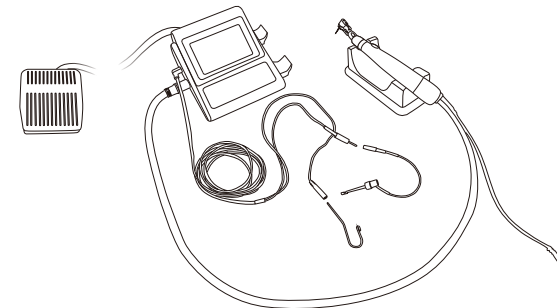


Install the contra angle



1. Please clean all the parts that have contacted to patient before using.
2. Aim the anchor points on the connector of the contra angle to the slot inside the unit to connect both parts, there is click after the correct installation.
3. Six directions of contra angle are available, between each direction is 60° .

Install the main unit



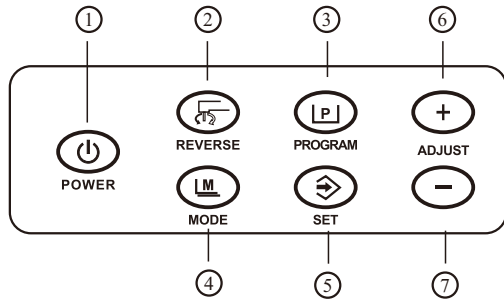
4

1. Put the instrument on a solid place.
2. Connect the plug of the motor wire to the main unit, make sure that they are in the right position.
3. Connect the contra angle to the motor.
4. Put the well connected main unit on the handle holder reposefully.
5. Insert the foot switch plug into the jack on the main unit in M2 and M3.
6. In M1, Insert the test wire to the hole on the main unit, and connect the file holder to test wire.
7. In M4 ,connect the lip hook line to the end of the handle socket.

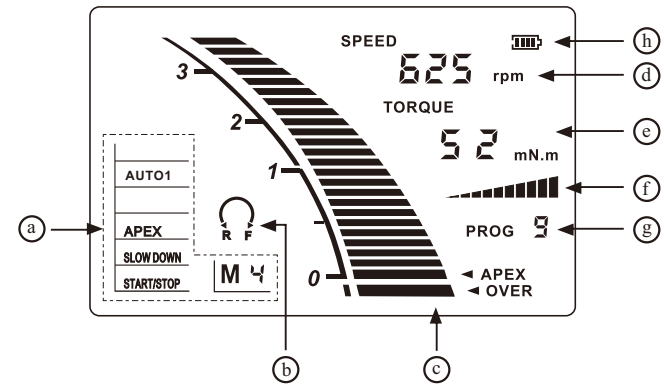
Notice: Please wear rubber gloves when operation.

Function definition

Key and display



- | | |
|---------------|------------|
| ① POWER key | ⑤ SET key |
| ② REVERSE key | ⑥ UP key |
| ③ PROGRAM key | ⑦ DOWN key |
| ④ MODE key | |



- | | |
|---------------------|----------------------------|
| ① Mode area | ③ Torque area |
| ② Direction area | ④ Current torque indicator |
| ③ Apex locator area | ⑤ Program area |
| ④ Speed area | ⑥ Battery level area |

1. Power

Press power key ① to turn on the unit, information will be displayed on LCD; press it again to turn off unit, information which on the LCD will disappears.

2. Direction switch

Press reverse key ② to set the working direction of the file, icon will be displayed on direction area ②.

Direction display: Forward. Reverse.

3. Program switch

Press program key ③ can switch the program, there are 9 programs can be saved; and which displayed on program area ③.

4. Mode switch

Press mode key ④ can switch the mode, there are 4 modes can be select; and which displayed on mode area ④.

5. Setting and adjust

Press set key ⑤ can switch between speed area ④, torque area ⑤ and program area ⑥, the value of the area which being selected will blink, and press the up key ⑥ and down key ⑦ to adjust the value.

Mode definition

The unit has 4 modes and consists of 6 function options.

Working mode table

MODE	Function option					
	Normal	Automatic1	Automatic2	Apex	Slow down	Start/stop
M1	—	—	—	✓	—	—
M2	✓	✓	—	—	—	—
M3	✓	—	✓	—	—	—
M4	—	✓	—	✓	✓	✓

NORMAL: Manual functions, file rotates in the setting speed.

AUTO M A T I C 1: When the file arrives the set torque or after arrives the setting position of root tip, the file begin to reverse, and after it leaves root canal or the torque decreases, it recovers to forward.

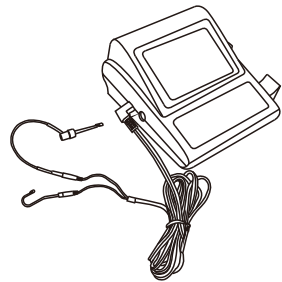
AUTO M A T I C 2: The file first clockwise rotates 2 laps, and then counterclockwise rotates 1 lap, and will continue this cycle.

APEX: Apex locator.

SLOW DOWN: When the file is approaching to apical foramen, the motor automatically slows down for safer treatment.

START/STOP: The file starts rotating automatically when inserted into the canal and it stops automatically upon with drawal.

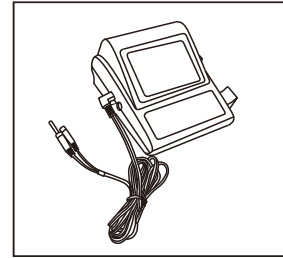
In M1 Mode, you can assemble the unit as follow:



M1: In this mode, only apex locator functions, methods of operation are as follows:

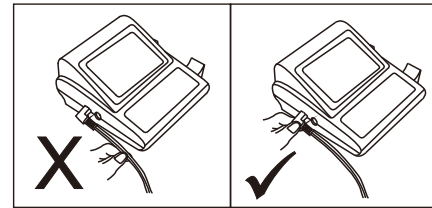
NOTICE:

It can not get an exact value of the apex length when the treatment is in an unstable condition. So, please insert the file into the root-canal and take an X-ray photo to make sure the veracity.

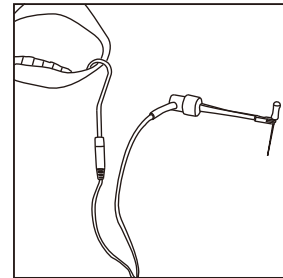


1. The plug of the testing wire should be completely plugged into hole on the main unit.

* **When you need to pull out the test wire, please don't pull the wire but hold its pin and pull it out.**



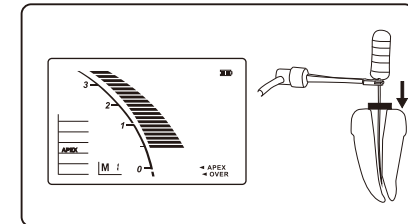
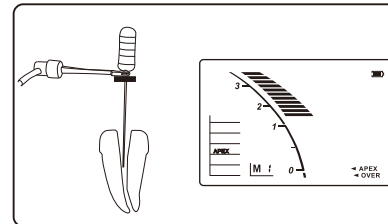
2. Clip the metal part of the file with the holder and hang the Lip hook up at any side of the patient's mouth.



3. Insert the file into the root-canal, and circumrotate the file toward the apex of the root-canal. And then the instance between the tip of the file and apex of the root-canal will be displayed on the LCD screen. When the figure on the LCD screen shows 0.5mm, please fasten the file with the rubber vernier caliper on the reference point of the tooth crest rather than keep up probing into the root-canal. Then measure the distance from

the bottom of rubber vernier caliper to the tip of the file.

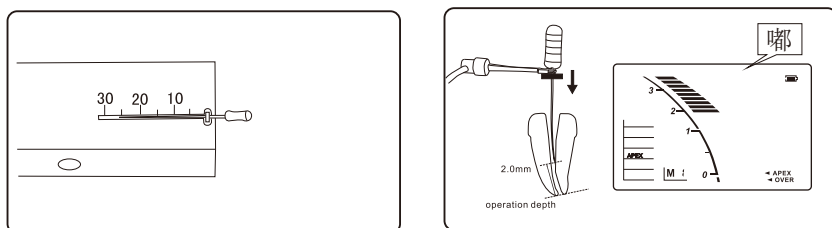
* Root-canal length is the file distance when the LCD displays 0.5.



4. Deciding the working length of root canal when the figure on the LCD screen shows 0.5mm, then measure the distance from the bottom of rubber vernier caliper to the tip of the file. Take note of this figure. So subtract 0.5-1.0mm from the above data is the working length of root-canal.

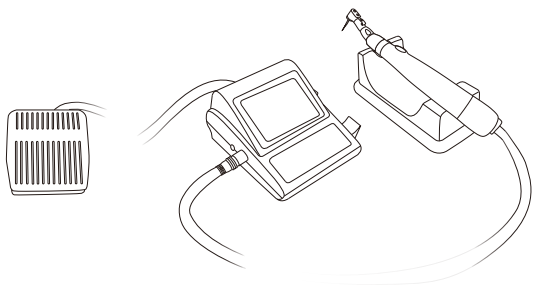
When the file drills through the root-canal, please make the final value in terms of the one measured in 0.5mm.

The working length of root-canal varies from each other for the reason of different shapes of teeth and root-canal.

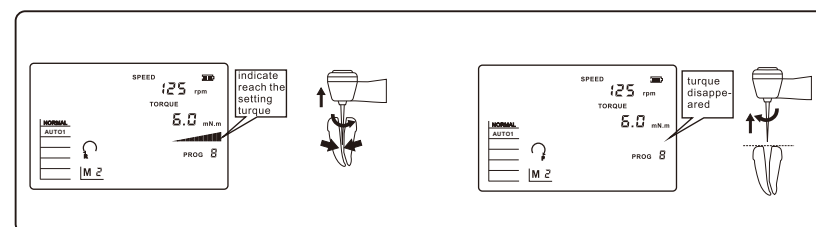
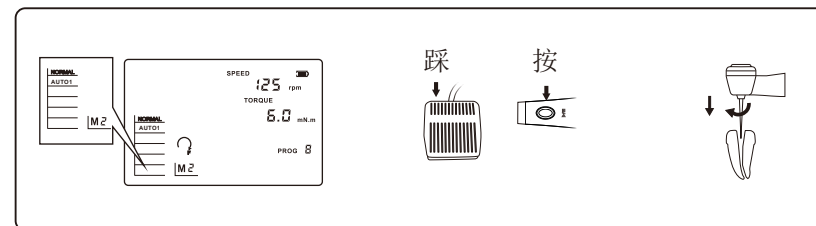


5. When the file reaches the position to 2.0mm away from the apex of the root-canal, there will be a continuous alarm.

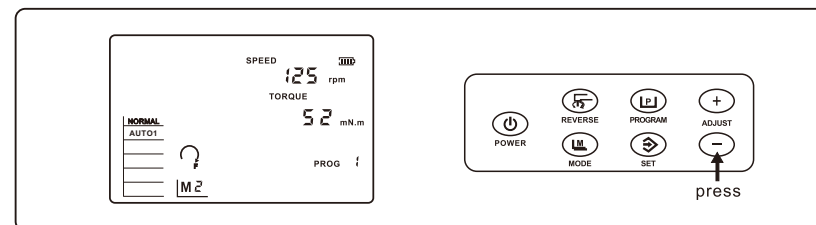
In M2 Mode, you can assemble the unit as follow:



M2: Single root canal expanded function, hold down the foot switch or press the handle button, the file will rotate; when the file arrived at the setting torque, the file will automatically reverse. When the torque reduces, the file will recover forward. Loosen the foot switch or press the handle button, the file stops rotating.



The calibration function:

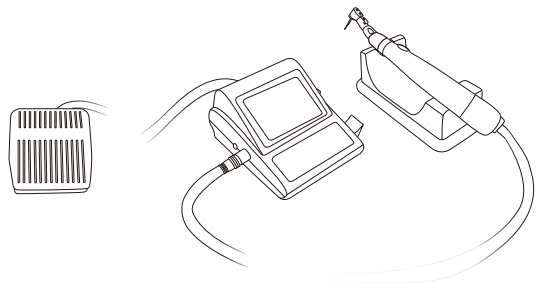


Under the mode of M2, the program is set to 1, and then set the rate of 125, torsion as 52, and then press "-" key about 3 seconds long, hear ringing sound for four, namely into the calibration mode. In calibration mode, the motor rotating, buzzer will ring a sound every 16 seconds, the entire process for a minute and a half. After that, the unit continuous ring 4 times.

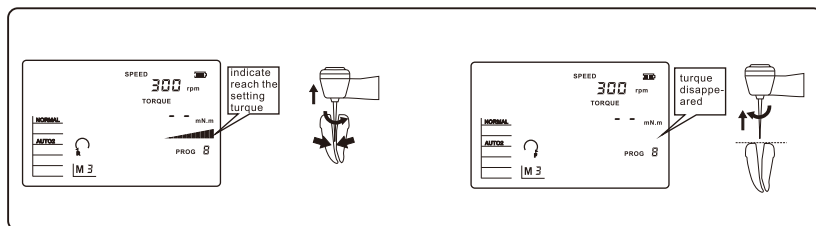
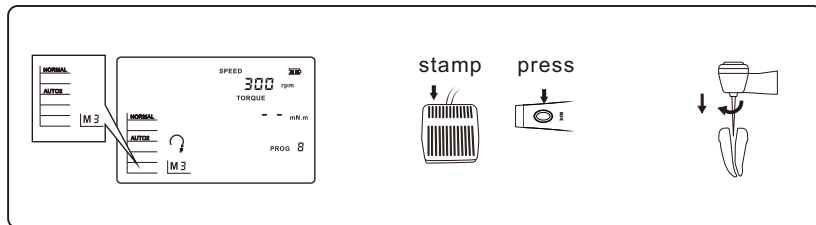
Notice:

This function is only applicable to replacing contra angle or motor, uses for calibration parameters to support new equipment. Before entering the calibration model, it should connect the motor and contra angle, plug in the file, and place the motor. In the process of calibration, don't touch the contra angle and the file, to avoid causing the calibration error. After calibration is completed, the user must be shutdown, restart again.

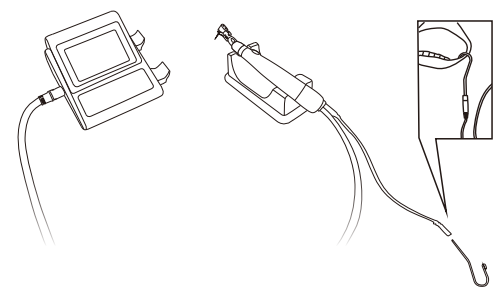
In M3 Mode, you can assemble the unit as follow:



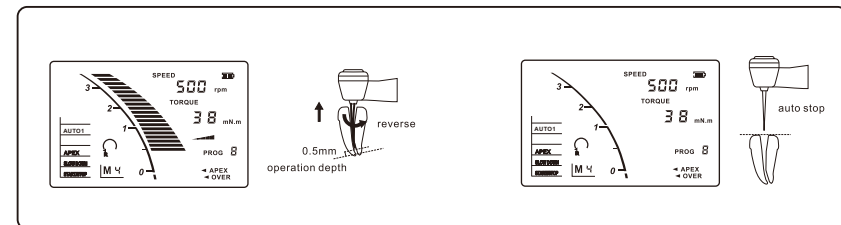
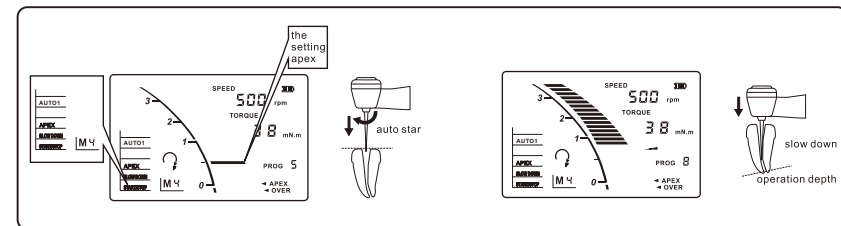
M3: Reciprocating rotation function, hold down the foot switch or press the handle, the file starts to reciprocating rotation, rotating situation for the reverse 150°, forward 30°, the speed of about 300 RPM. Loosen the foot switch or press the handle button, the file will stop running.



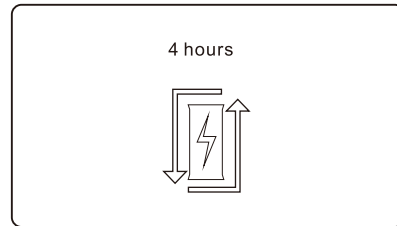
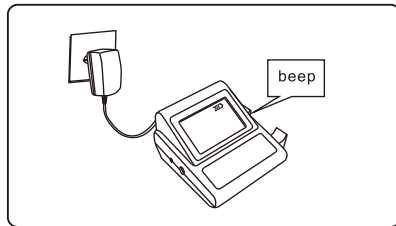
In M4 Mode, you can assemble the unit as follow:



M4: With the function of root canal measuring root canal expanded, after the root canal file into the root canal, the file started forward. After the file arrives the district of root canal stenosis, it begins to rotate slowly, and then automatically reverse when arrived at the apices of the setting position. It restores the original speed operation after leave narrow area, and automatically stop after leave the root canal.



Charge



LCD displays the current battery power, the number of lattice shows more, and the power is fuller. If there is no electricity, the lattice will flicker, which means the battery power is about to run out, at this status the beeper will ring per 3S, and the unit will shut down after 60S. To fully charge the battery, you should connect the unit to adaptor at least for 4 hours or more (The new battery requires at least 8 hours or more), the sign will be running during the battery charging.

Notice: when the instrument is connected to the adaptor, the unit will power off automatically, and the beeper will beep for three times, showing the connection is correct.

Automatic power off

The instrument will shut down automatically when it continues working for 3minutes. In that case, all display and function will stop.

Notice: When power off, the LCD will show recharging sign when charging.

Maintenance and sterilization

1. If not use the unit for long time, please open the battery cover and remove the battery, keep the instrument clean and store it somewhere dry and clean.
2. Parts like contra angle and stainless electrode, which have direct contact with the patient, should be disinfected by autoclave each time after using. The contra angle holder and the electrode wire can be autoclavable at 135° C.
3. The crust of the instrument and the wire should be disinfected by the ethanol.

Troubleshooting

If the equipment is not normal work, before call our after-sales center, please check the table below.

Phenomenon	Reason analyses	Problem shooting
Can't power on	Low battery	Recharge the battery
File doesn't run	Bad contact in foot switch	Check the wire and make sure the foots switch works well
	Resistance in root-canal is too much	Increase the torque by manual adjusting the forward/reverse mode
File stops automatically	Resistance in root-canal is too much	Increase the torque by manual adjusting the forward/reverse mode
	Bad condition in root canal	Change to non-apex locator mode
Inaccurate apex value	The unit is in unstable condition	Restart and compare with x-ray film
	Bad condition in root canal	Clean the liquid and remnant
	Electromagnetic Interference	Don't use the adaptor for charging
File can't reverse automatically	Not in auto-forward/reverse mode	Select auto-forward/reverse mode
	Preset torque is too much	Decrease the torque
	File has not reached the preset apex	File will reverse only when the file reach the preset apex location

File can't start	The file hasn't been into the root canal	The file will start when goes into the root canal
	Root canal is too dry	Infuse some normal saline
	The pin or electrode is in bad contact	Clean or change the pin/electrode
	Oral mucosa is too dry	Partial humidify oral mucosa
Auto start/stop out of control	Electromagnetic Interference	Don't use the adaptor for charging
		Change to non-apex locator mode
The file reverses continually	Resistance in root-canal is too much	Increase the torque by manual adjusting the forward/reverse mode
The file reverses continually	Bad condition in root canal	Clean the liquid and remnant
		Change to non-apex locator mode
	The preset apex location is too high	Reset the apex location
The file reverses continually	The opening of root canal is too small	Enlarge it
	The file is too big	Change a smaller size
	Electromagnetic Interference	Don't use the adaptor for charging
The using time of battery is too short	Not fully charged	Charge the battery at least 4 hours
	Battery is aged	Replace the battery

Our company is responsible for product-and-technology service. Our experienced technician will offer you technical support when technical problem occurs.

Guarantee

The main unit are guaranteed for 24 months from the date of purchase. The accessories (contra angle, motor handle, file holder, adaptor, foot switch, test wire and lip hook line)are guaranteed for 6 months. The guarantee is valid for normal usage conditions. Any modification or accidental damage will render the guarantee void.

Technical services

- Power adaptor: Input: 100-240 Vac 50/60Hz
 Output: DC 10V/1.5A
- Battery Voltage: DC 7.4V
 Capacity: 1000 mAh
- Rotation speed: 125-625rpm
- Torque 0.3-5.2N.cm (3-52N.m)
- Temperatures Operating: +10°~+40°C
 Storage: -10° ~+55°C
- Humidity Operating: 30~75%RH
 Storage: 20~85%RH
- Atmospheric pressure Operating: 80~106kPa
 Storage: 50~106kPa
- Protection against electrical shock: Type B

Symbols and definition

-  Class II equipment(Adaptor)
-  Direct current
-  Type B equipment
-  Caution! Please read the instruction
-  Used indoor only
-  This way up
-  Fragile,handle with care
-  Keep away from rain
-  CE marked product
-  WEEE
-  Please refer to the instructions