Endo Radar Endo Motor

INSTRUCTION MANUAL

Please read this manual before operating

CE 0197

www.glwoodpecker.com

GUILIN WOODPECKER MEDICAL INSTRUMENT CO., LTD.

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1 Introduction

1.1 Foreword

Guilin Woodpecker Medical Instrument Co., Ltd. is a high-tech enterprise in researching, developing, and producing dental equipment, and has a perfect quality assurance system, main products including ultrasonic sealer, curing light, Endo motor, apex locator and ultrasurgery, automatic water supply system etc.

1.2 Introduction

Endo Motor products are mainly used in dental root canal preparation, is used for each model pulpitis and pulp necrosis and various root tooth root canal treatment of periarthritis of important equipment.

The equipment has the following characteristic:

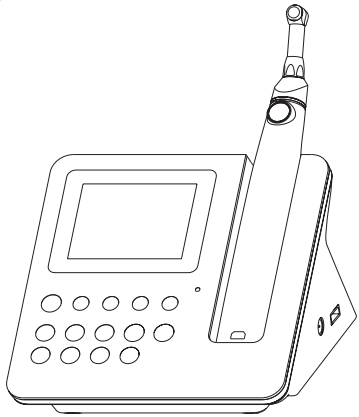
a) Integrates the function of root canal length measurement, can the measurement of single root canal, root canal preparation, also can undertake root canal measurement and preparation at the same time.

b) The precise feedback technology, are sensitive to control the motor output torque, in order to protect the root canal file

c) Cordless handle , operating freely.

d) Large capacity battery equipped with wireless charging system, Ensure long enough use time.

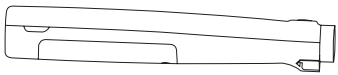
1.3 Product configuration



1.3.1 Structure

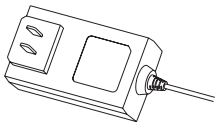
Endo Radar is composed of Motor handpiece, Contra-angle, measuring wire, USB wire , Power adapter, etc...

1.3.2 Product accessories

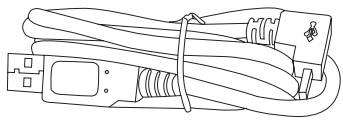


Motor handpiece

Contra-angle

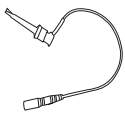


Power adapter

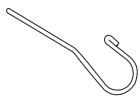


USB wire

Measuring wire



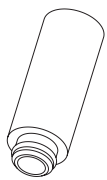
File clip



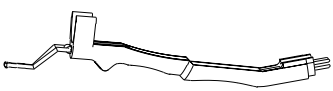
Lip hook

Touch probe

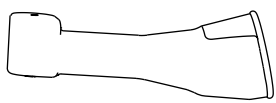
Tester



Lubricator



Connecting & LED holder



Protective silicon cover

1.4 Indications for use

Endo Radar is a cordless motor handpiece with torque and speed control used for driving files in both reciprocating and continuous rotary mode during an endodontic procedure.

1.5 Range of application

1.5.1 This product is suitable for various pulpitis and pulp necrosis and various types of periarthritis of root tooth root canal preparation.

1.5.2 The product is only suitable for hospitals, clinics, and must be used by a qualified dentist at the same time.

1.5.3 Contraindications

In cases where a patient has been fitted with an implanted heart pacemaker (or other electrical equipment) and has been cautioned against the use of small electrical appliances (such as electric shavers , hair dryers , etc) it is recommended not to use the this device.

1.5.4 The classification of the device

Internal power device.

Applied part: file clip, lip hook, touch probe, contra-angle.

Type B applied part.

Device not suitable for being used in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

1.5.5 The main technical parameters

Battery: Base 2600mAh, 11.1V

Motor handpiece 750mAh, 3.7V

Power adapter: ~100V-240V 0.8A 50Hz/60Hz

Torque range : 6mNm~40mNm(0.6Ncm~4Ncm)

Rotate speed : 100rpm~650rpm

1.5.6 Working environment

Environment temperature: +5℃~+40℃

Relative humidity: 30%~75%

Atmosphere pressure: 70kPa~106kPa

1.6 Warnings ⚠

1.6.1 The device must only be used in suitable locations and only by specialized physicians licensed to practice dentistry.

1.6.2 Use the specified battery for this device. Never use any other batteries.

1.6.3 Do not expose the device to direct or indirect sources of heat. Operate and store the device in safe environment.

1.6.4 The device requires special precautions as regards electromagnet compatibility (EMC) and must be installed and commissioned in strict conformity with the EMC information provided in this instruction manual. Specifically, do not use the device close to fluorescent lamp, radio transmitters and remote controls.

1.6.5 Long time use of the device will lead to overheating of the micro motor, let it cold down that use. If the motor handpiece overheats too persists, contact your distributor.

1.6.6 The USB port of the base must only be connected to USB port of the handpiece through the USB wire. Never use it for other purposes.

1.6.7 Over-heat scorching: the handpiece cannot be used for 10 minutes continuously.

1.6.8 If the handpiece works for 10 minutes continnously, the temperature of the surface of the handpiece and contra-angle may reach 56℃.

Contra-angle

1.6.9 Only use the original WOODPECKER contra-angle. Do not use any other contra-angle or other reduction rate other than original one.

1.6.10 Never press the contra-angle push button when the motor handpiece is running or if it is coming to a stop. This will lead to detachment of the instrument or cause the pushbutton to overheat.

1.6.11 Never remove the contra-angle from the motor handpiece during operation.

1.6.12 Only use undamaged root canal instruments. Please refer to the information provided by the manufacturer.

1.6.13 Only insert the instrument when the contra-angle is stationary.

1.6.14 Never place your fingers on the moving parts of the instrument while it is running or coming to a stop.

1.6.15 Before treatment, check the contra-angle for any damage or loose parts.

Root canal instruments

1.6.16 Before use, make sure the instrument is securely locked in place.

1.6.17 Never use continuous rotary instruments in reciprocating mode.

1.6.18 Never use reciprocating instruments in rotary mode.

1.6.19 Use the torque and speed settings recommended by the instrument manufacturer.

2 Installation and setting

2.1 Please remove the “Switch label” before first time usage.

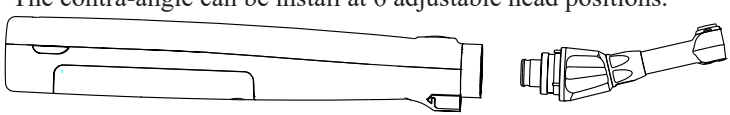
2.2 Through the tail restart hole can be directly cut off the base power supply circuit, when there was a crash phenomenon such as the base, can use a needle inserted with hole, when the base shutdown can be pulled out, then open the base again, then to restart the base operation.

2.3 Installing and removing the contra-angle

2.3.1 Installing

Position the projecting tip of the contra-angle opposite the motor handpiece slot, push the projecting tip of the contra-angle into the slot without forcing until it “clicks in”.

The contra-angle can be install at 6 adjustable head positions.



2.3.2 Removing

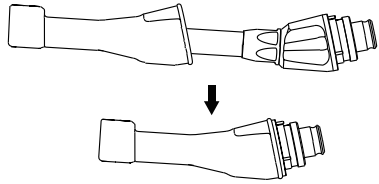
When removing the contra-angle, pull it straight out.

When inserting and removing the contra-angle, turn the motor handpiece power off beforehand.

2.4 Installing and removing the protective silicon cover

2.4.1 Installing

Put the protective silicon cover onto the contra-angle.



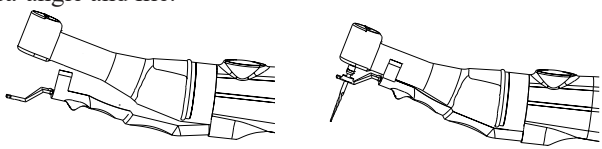
2.4.2 Removing

When removing the protective silicon cover, pull it straight out slowly.

2.5 Installing and removing the Connecting & LED holder

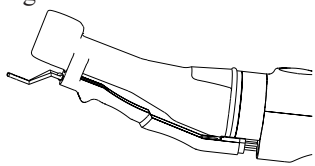
2.5.1 Installing

Install the Connecting & LED holder into the motor handpiece, clamp the contra-angle and file.



2.5.2 Removing

Sliding it in the direction of the socket of motor handpiece and then removed with contra-angle. Otherwise it will be damaged.



2.6 Inserting and removing the file

2.6.1 Inserting

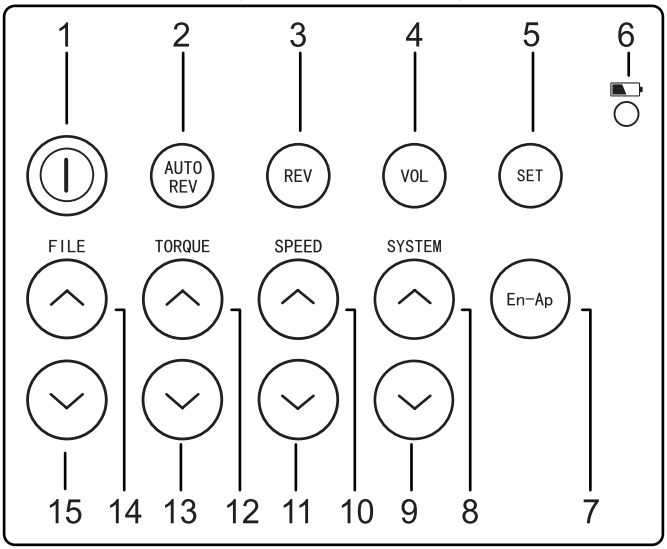
Insert the file into the chuck until it stops.

2.6.2 Removing

Press the push-button and pull out the file.

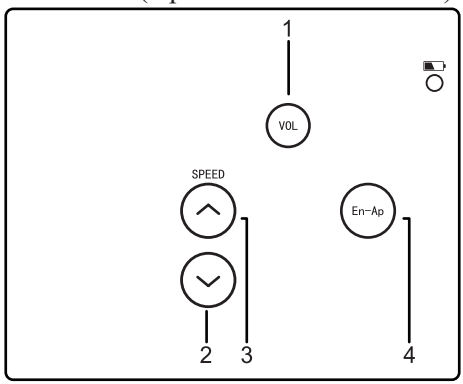
When inserting and removing the file, turn the motor handpiece power off beforehand.

2.7 Touch button of base(Motor alone mode)



1 POWER Power on or power off
2 AUTO REV Automatic protection mode
3 REV Forward or reverse
4 VOL Adjust the volume
5 SET Parameters calibration
6 LED If continuously with green LED, it means wireless charging
7 EN-Ap The mode switch
8 SYSTEM+ Select the File system
9 SYSTEM- Select the File system
10 SPEED+ Increase the motor rotation speed
11 SPEED- Decrease the motor rotation speed
12 TORQUE+ Increase the torque
13 TORQUE- Decrease the torque
14 FILE+ Positive selection key
15 FILE- Negative selection key

2.8 Touch button of base(Apex locator alone mode)

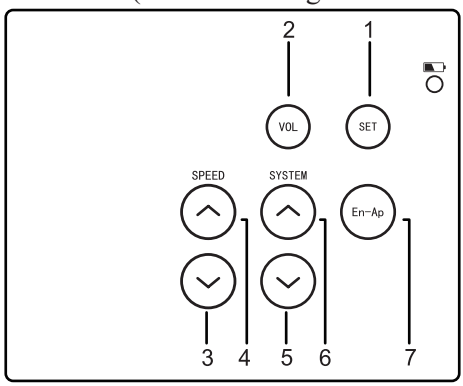


1 VOL Adjust the volume

2 3 SPEED +- Set the apical point, it can be set anywhere from 10 to apex(00)

4 En-Ap The mode switch

2.9 Touch button of base(Combined length determination mode)



Combined length determination mode parameter setting:

1 SET Touch the button for more than 1 seconds, enter combined length determination mode parameter setting. Touch again, then exit .

2 VOL Adjust the volume

3 4 SPEED +- Set the apical point, it can be set anywhere from 10 to apex(00)

5 6 SYSTEM+- Select “AP.REV/AP.STOP”, “AUTO”, “SL.D.”

7 En-Ap Select “AP.REV” or “AP.STOP”, enable or disable “AUTO”, enable or disable “SL.D.”

AP.REV Auto apical point reverse

The file will reverse when the file tip reaches the apical point.

AP.STOP Auto apical point stop

The file will stop when the file tip reaches the apical point.

Enable auto start

The file will starts rotating when it is inserted the canal.

AUTO Disable auto start

SL.D. Enable apical point slow-down

The file slows down as it approaches the apical point.

SL.D. Disable apical point slow-down

File Library

2.9.1 The device contains a file library with the preset popular NiTi file systems.

2.9.2 Please follow the file manufacturer’s instructions for use .The file system shown on the display must always match the file in use.

2.9.3 Torque and speed values are subject to change by the file manufacturers without notice. Therefore, the preset values in the library must be checked prior to use.

2.9.4 Please use the 8 sets Individual Program to create your own file sequence. This enables you to manage your own series of files.

2.9.5 Never use reciprocating files in continuous rotary mode. Never use rotating files in reciprocating mode.

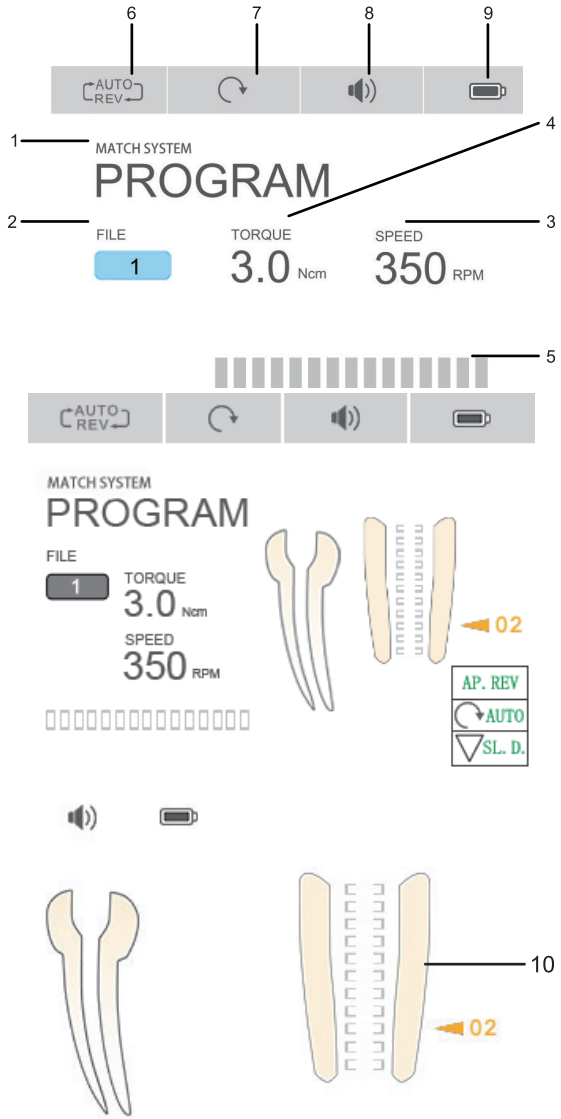
2.9.6 Reciprocating mode

a.Speed and torque cannot be adjusted at WAVE ONE/RECIPROC system

b. Three reciprocating angles are available at RECIPROCATING system.

c. If the maximum torque is achieved , the motor will auto reverse. If this occurs, remove the file from the root canal and clean the flutes.

2.10 LCD screen



1 SYSTEM display the selected file system
2 FILE display the selected file type
3 SPEED display the rotation speed(applied only to continuous rotation mode)
4 TORQUE display the limiting value of torque
5 TORQUE BAR display the limiting value of torque in the bar
6 AUTO REVERSE display the selected auto reversing protection mode:

AUTO REVERSING

AUTO STOP

AUTO REVERSE OFF

7 ROTATIONAL DIRECTION
Display the rotation direction of device


clockwise continuously rotating


counterclockwise continuously rotating


Reciprocating motion mode

8 BATTERY
Display the remaining power of base:


Full state of charge


15%-80% of electricity


Prompt charging is needed due to the very low power

9 VOLUME
Display the volume of main unit


high volume

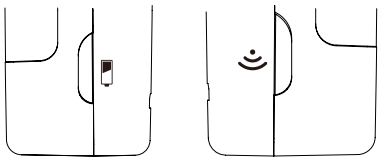
low volume

on silent mode

10 APEX BAR

Display apex bar

2.11 Introduction of LED and button on handpiece



2.11.1 The state of battery:

a) (green)full state of charge or enough

b) (yellow) 30%-60% electricity remained

c) (red)less than 30% of electricity, the battery need to be charged immediately.

2.11.2 Wireless connecting state:

a) (green) wireless communication connected

b) (light off)Disconnected and long press the button, to restart the handpiece

2.12 Standby mode

If the device is not used for 3 minutes, the motor handpiece will automatically shut down. In shutdown mode, press the handle button, you can boot instantly.

3 Motor alone mode

3.1 Base start and stop

3.1.1 starting: If power off, press and hold the POWER button for several second, welcome screen will appear.

3.1.2 shutdown: When power on, press and hold the POWER button for 1 second, the screen slowly get dark, and the device shutdown.

3.2 Starting and stop of Handpiece

3.2.1 When the handpiece is off, press the ON / OFF button, if the

LED is green , indicating that the handpiece is ready for work.

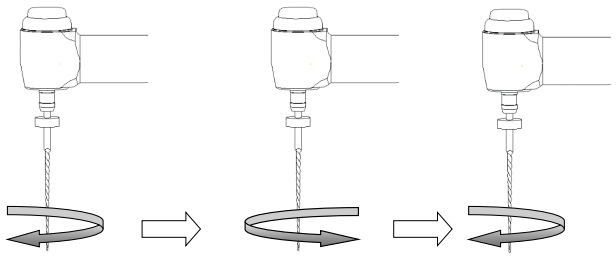
3.2.2 The handpiece is ready for work, if the LED is green, the handpiece will work as the set program.

3.2.3 Long press the ON/OFF button, and the handpiece will turn off.

3.3 Auto reversing protection mode

3.3.1 AUTO REVERSING

During operation, if the load exceeds a preset value, the needle rotation mode file automatically becomes reverse mode. When the load again lower than the preset value, the file returns to the needle rotationally forward mode.

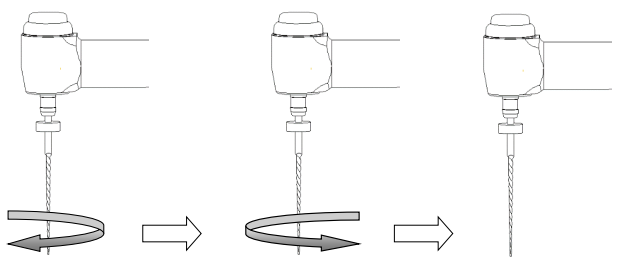


AUTO REVERSING mode is only effective continuous forward

3.3.2 AUTO STOP:

During operation, if the load exceeds a preset value, The motor reverse automatically and the base alarms .if the load lower the preset value, The motor stops.

Push the handpiece button twice to restart the handpiece.



3.3.3 AUTO REVERSE OFF

If the load lower the preset value, The motor stops.

Push the handpiece button twice to restart the handpiece.

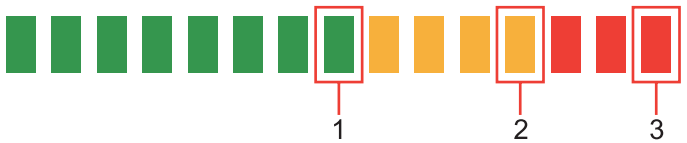
3.4 The display of the torque

Instructions

a)when it shows location 1 in the picture, The current load is 50% of the preset load

b) when it shows location 2 in the picture, The current load is 80% of the preset load

c) when it shows location 2 in the picture, The current load is 100% of the preset load and the motor stops.



3.5 File choosing system

Touch the SYSTEM button to select the different system.Touch the FILE button to select the different type of file from the system.

3.6 User defined system

The device is delivered with 8 programs with default values of torque and speed.

Specific operation as follows

a.Push SYSTEM button to change to PROGRAM mode

b.Push FILE button to the subsystem ,which is not be setted

c.Push SPEED button and TOPQUE button to set user's parameters

3.7 Changing the speed and torque

When desired continuous rotary file is selected,press SPEED key to select the desired speed setting.

Press the TORQUE key to select the desired torque setting.

The speed and torque cannot changed for reciprocating systems.

3.8 Calibration

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

Calibration is recommended when using a new/other contra-angle or after an extended period of operation, as the running properties can change with usage, cleaning and sterilization.

a. Install the contra-angle to the motor handpiece.

b. Touch the "En-Ap" button to select the Motor alone mode.

c. Touch the “SET” button for more than 1 seconds to enter setting interface.

d. Touch the “SYSTEM” button to select “Contra-angle Calibration” , then touch the “En-Ap” button to enter the calibration.

e. Power on the motor handpiece to start calibration.

f. The screen display “Calibration Successed”, then the display return to its original state.

3.9 Battery charging

3.9.1 Base charging

The base has battery,when the LED twinkle and turn red , please do not use anymore.then connect the charger

3.9.2 Handpiece charging

The handpiece has wired charging and wireless charging function.

a. Wireless charging: during the main unit is working, put the handpiece in to the main unit, the LED will be turn light.

b. Wired charging : connect the USBwire between the handpiece and the main unit, when it needs to be recharged during operation (as the picture)

⚠ WARNNING

a. Do not open the device ,or change the battery. That may cause a short-circuit.

b. If the battery leakages, please stop using immediately, and deliver the machine to the authorized service center for repairing.

c. Please do not use other USB cable to charging, otherwise will cause damage to the machine.

4 Apex locator alone mode

4.1 Insert the measuring wire

4.1.1 Insert the plug of the measuring wire into the left side socket of the unit.(as the picture)

Picture 1

Attention:

a. Please be careful to use the device, keep it stable and avoid hit. Incautious use will lead to the damage or the failure of the machine.

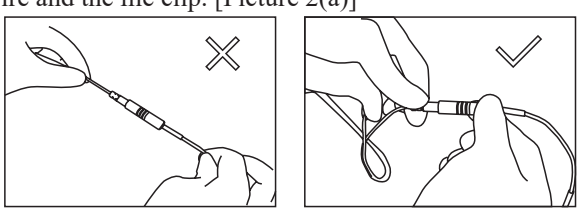
b. Measurement cannot be proceeded without the complete insertion of the plug.

c. Be sure not to hit the plug. Keep the device away.

4.1.2 Insert the file clip and lip hook respectively into the two sockets of the measuring wire. [Picture 1]

Attention:

Be sure not to pull the wire when inserting or pulling out the measuring wire and the file clip. [Picture 2(a)]



Picture 2(a) Picture 2(b)

Correct operation showed as in picture 2(b).

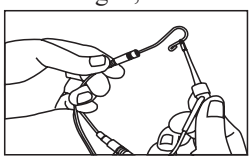
4.2 Test the wire connectting (Test before each use)

a. Press the power button .When the machine is starting up, you can press the En-Ap button. And you can enter into the apex measure module.

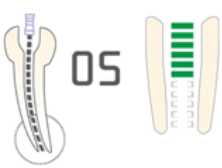
b. Make sure if the plug of the measuring wire is inserted into the socket correctly.

c) Make sure if the file clip and lip hook are connected well to the measuring wire.

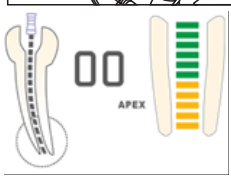
d) Make the lip hook touch the bent wire of the file clip [as showed in picture 3] to confirm all the instruction bars are displayed on the LCD screen and static display the digital '-3', otherwise , it means that the file clip or the measuring wire is damaged, should be replaced.



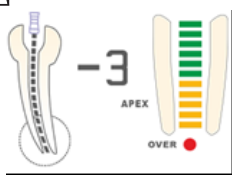
Picture 3



Picture 4(a)



Picture 4(b)



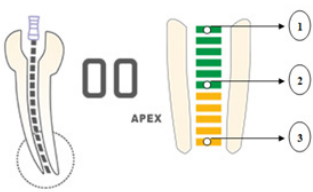
Picture 4(c)

4.3 Explanations on the interfaces displayed

a) The screen displays the front region of the apical foramen by instruction bars. Please refer to the green region as showed. [Picture 4(a)]

b) The file has gone to the position near by the apical foramen when it comes to the orange bars. [Picture 4(b)]

c) The file has exceeded the apical foramen when the red bars displayed.A continuous beep sound will be generated at the same time [Picture 4(c)]



1) Approx 2mm to apical foramen
2) Approx 0.6mm to apical foramen
3) Apex(apical foramen)

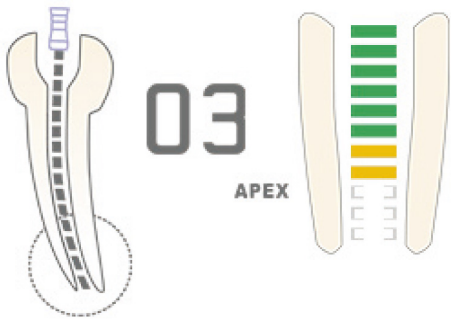
4.4 Testing the device by tester. (Two weeks test again)

User can use the tester to check if the device work properly, specific operation is as follows:

a. Pulling out the measure wire and turn off the device.

b. Insert the tester

c. Turn on the device and press the En-Ap button. Then you can enter into apex measure module. The screen shows “02”or ”03” or”04”. It means the machine is fine.



4.5 Operation instruction

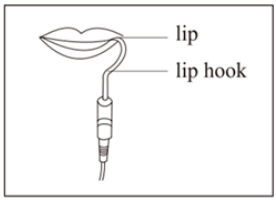
4.5.1 Please let the measure wire insert the base. Then staring up the power button. Next press the “En-Ap” button. And you can enter into the apex mode.

4.5.2 When the device is starting up, you can press the power button again. And the machine can turn off.

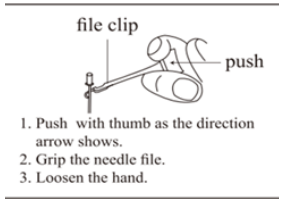
4.5.3 If you press the“ VOL” button, you can turn up the voice.

4.5.4 Hang the lip hook on the lip, make sure it contact the oral mucosa as a reference electrode [Picture 5].

4.5.5 Clip the file with file clip, approach to the apex, then there will be continuous alarm when the distance is less than 2mm [Picture 6].



Picture 5



Picture 6

Attention:

a. When grip the root canal with a needle file, please grip the upper of the metal part(near the root canal at the needle handle). If you grip the lower part (bladeor moving part),it will wear the metal part of the file folder and the resin part. [Picture 7]

b. When measuring the length of root canal, please don't use the metal needle file.

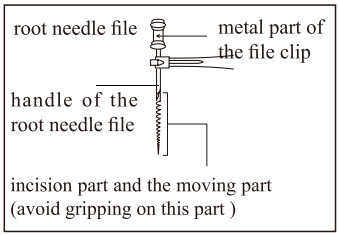
If you operate the device without the dentistry glove,it will cause leakage and the result of measurement will be inaccurate.Therefore, please use the resin needle file and remember don't touch the metal part with finger.

c. Please don't use the worn file clip, and it will make the result of measurement inaccurate.

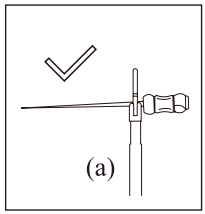
d. Please reference the [Picture 8(a)] to grip the needle file. If as [Picture 8(b)], it can't.

4.5.6 When the file reaches the apex, adjust the rubber piece set on the endo file to the reference point (incision edge or fossa edge), then pull out the endo file, measure the length between the top of the file and the rubber piece, and this is the working length of the tooth. It also can be used with the touch probe instead of file clip, when it is inconvenient to measure the back teeth. [Picture 9]

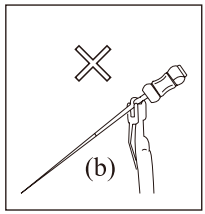
4.6 The components that touch body must be autoclaved under high temperature and high pressure. The shell and measuring wire should be cleaned by 75% alcohol.



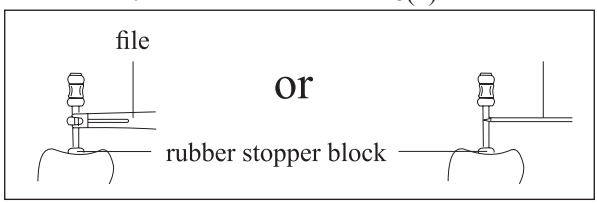
Picture 7



Picture 8(a)



Picture 8(b)



Picture 9

4.7 Cleaning and disinfection

4.7.1 You can use the alcohol or the soap clean the machine and the measuring wire.

4.7.2 Don’t use the chemical reagent.

4.7.3 The hip hook,filp clip,touch probe and the contra-angle must be cleaned, disinfected before you start the treatment.

⚠ WARNNING

Measuring wire cannot be clean by high temperature and high pressure.

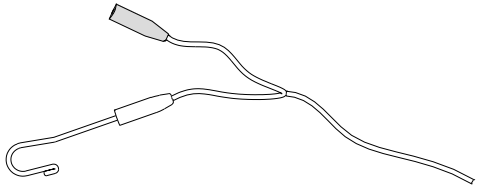
5 Combined length determination mode

For a combined length determination

5.1 Base installing

5.1.1 Insert the measuring wire into the left side female socket of the base.

5.1.2 Insert the lip hook into the white female socket of measuring wire.



5.1.3 Insert the USB wire's male plug (big) into the right side USB's female socket of the base.

5.2 Contra-angle & Motor handpiece installing

5.2.1 Put the protective silicon cover onto the contra-angle.

5.2.2 Install the contra-angle into the motor handpiece.

5.2.3 Install the Connecting & LED holder into the motor handpiece, clamp the contra-angle.

5.2.4 Install the file into the contra-angle, clamp the file.

5.2.5 Insert the USB wire's male plug (small) into the upper side female socket of the motor handpiece.

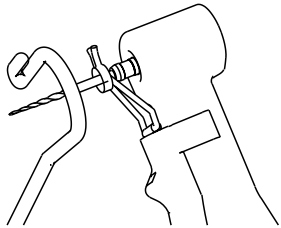
5.3 Base setting

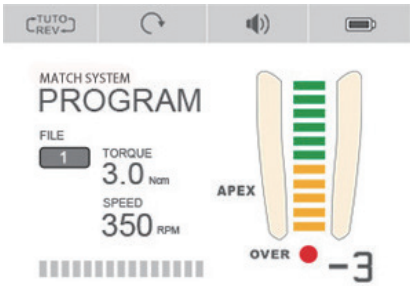
5.3.1 Touch the "En-Ap" button to select the Combined length determination mode.

5.3.2 Select file system.

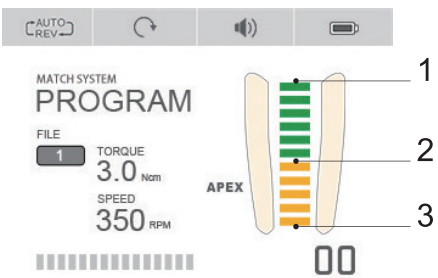
5.3.3 Combined length determination mode parameter setting (See 2.9).

5.4 Connection testing(Test every time before using): touch the file with the lip hook, if it show"-3", it works well, otherwise, the USB wire or measuring wire should be replace.





5.5 Hook the lip hook in the corner of the patient's mouth.
5.6 Power on the motor handpiece to operate.
5.7 The display of root hole magnified area display in combined length determination mode:



1 Approx 2mm to apical foramen
2 Approx 0.6mm to apical foramen
3 Apex(apical foramen)

6 Trouble shooting

When trouble is found, check the following points before contacting your distributor. If none of these are applicable or the trouble is not remedied even after action has been taken, the product may have failed. Contact your distributor.

Problem	Cause	Solution
The handpiece cannot be connected to the base	1. The wireless connection has failed 2. Handpiece far from the base.	1.Press the handpiece “ON/OFF” button more than 5 seconds to power off and power on again. 2. Place the handpiece near the base and power on.
The contra-angle cannot be calibrated.	The calibration procedure may have been interrupted by increased resistance in the contra-angle.	If calibration has been interrupted, calibrate the motor handpiece again to rule out the possibility of a motor fault. 2.Clean and lubricate the contra-angle. 3.Start the calibration procedure again.
Motor handpiece is getting hot.	Run time is too long with reciprocating mode	Allow the device to cool down and start again the motor handpiece.
Continuous rotary file blocks in the root canal	Wrong file setting. Too much pressure on the instrument.	Change the rotational direction by pressing the REV key. Start the handpiece and pull out the file carefully.
Reciprocating file blocks in the root canal.	Too much pressure on the instrument. File not frequently clened.	Try to remove the file with a pair of pliers by pulling out and rotating the file gently clockwise.

7 Cleaning, Disinfection and Sterilization

7.1 Foreword

For hygiene and sanitary safety purposes, the connecting & LED holder, the contra-angle, the lip hook, the file clip,the protective silicon cover and the touch probe must be cleaned, disinfected and sterilized before each usage to prevent any contamination. This concerns the first use, as well as all subsequent uses.

7.2 General recommendations

7.2.1 Use only a disinfecting solution which is approved for its

efficacy (VAH/DGHM-listing, CE marking, FDA and Health Canada approval) and in accordance with the DFU of the disinfecting solution manufacturer.

7.2.3 Do not place the contra-angle in a disinfectant solution or in an ultrasonic bath.

Do not use chloride detergent materials.

7.2.4 Do not use bleach or chloride disinfectant materials.

7.2.5 For your own safety, please wear personal protective equipment (gloves, glasses, mask).

7.2.6 The user is responsible for the sterility of the product for the first cycle and each further usage as well as for the usage of damaged or dirty instruments where applicable after sterility.

7.2.7 The water quality has to be convenient to the local regulations especially for the last rinsing step or with a washer-disinfector.

7.2.8 Do not sterilize the motor handpiece, the AC adapter or the base. After each use, all the objects that were in contact with infectious agents should be cleaned using towels impregnated with a disinfecting and detergent solution (a bactericidal, fungicidal and aldehyde free solution) approved by VAH/DGHM-listing, CE marking, FDA and Health Canada.

7.2.9 To sterilize the endodontic files, refer to the manufacturer's instructions for use.

7.2.10 The contra-angle needs to be lubricated after cleaning and disinfection, but before sterilization.

7.3 Step-by-Step Procedure

#	Operation	Operating Mode	Warning
1	Preparation	Remove accessories (connecting & LED holder, contra-angle, lip hook, file clip,protective silicon cover and touch probe) from handpiece and base.	

#	Operation	Operating Mode	Warning
2	Automated Cleaning with washer-disinfector	Put the accessories (connecting & LED holder, contra-angle, lip hook, file clip, protective silicon cover and touch probe) into the washer disinfector (Ao value >3000 or, at least 5 min at 90°C/194°F)	- Avoid any contact between the contra-angle and any instruments, kits, supports or container. - Follow instructions and observe concentrations given by the manufacturer (see also general recommendations). - Use only approved washer-disinfector according to EN ISO 15883, maintain and calibrate it regularly. - Make sure accessories (contra-angle, lip hook, file clip, protective silicon cover and touch probe) are dry before moving to the next step.
3	Inspection	Inspect the accessories (connecting & LED holder, contra-angle, lip hook, file clip, protective silicon cover and touch probe) and sort out those with defects.	- Dirty accessories (contra-angle, lip hook, file clip and touch probe) must be cleaned and disinfected again. - Lubricate the contra-angle with an adequate spray before packaging.

#	Operation	Operating Mode	Warning
4	Packaging	Pack the accessories (connecting & LED holder, contra-angle, lip hook,file clip , protective silicon cover and touch probe) in "Sterilization pouches".	- Check the validity period of the pouch given by the manufacturer to determine the shelf life. - Use packaging which is resistant to a temperature up to 141°C (286°F) and in accordance with EN ISO 11607.
5	Sterilization	Steam sterilization at 134°C, 2.0bar-2.3bar(0.20Mpa-0.23MPa), for 4 minutes.	- Use only autoclaves that are matching the requirements of EN 13060, EN 285. - Use a validated sterilization procedure according to ISO 17665. - Respect the maintenance procedure of the autoclave device given by the manufacturer. - Use only this recommended sterilization procedure. - Control the efficiency (packaging integrity, no humidity, color change of sterilization indicators, physico-chemical integrators, digital records of cycles parameters). - Maintain traceability of procedure records.

#	Operation	Operating Mode	Warning
6	Storage	Keep the accessories (contra-angle, lip hook, file clip and touch probe) in sterilization packaging in a dry and clean environment.	- Sterility cannot be guaranteed if packaging is open, damaged or wet. - Check the packaging and the contra-angle before using it (packaging integrity, no humidity and validity period).

8 Storage, maintenance and transportation

8.1 Storage

8.1.1 This equipment should be stored in a room where the relative humidity is 10% ~ 93%, atmospheric pressure is 70kPa to106kPa, and the temperature is -20°C ~ +55°C.

8.1.2 Avoid the storage in a too hot condition. High temperature will shorten the life of electronic components, damage battery, reshape or melt some plastic.

8.1.3 Avoid the storage in a too cold condition. Otherwise, when the temperature of the equipment increases to a normal level, there will be dew that will possibly damage PCB board.

8.2 Maintenance

8.2.1 This device do not include accessories for repair usage, the repair should be carried out by authorized person or authorized after service center.

8.2.2 Keep the equipment in a dry storage condition.

8.2.3 Do not throw, beat or shock the equipment.

8.2.4 Do not smear the equipment with pigments.

8.3 Transportation

8.3.1 Excessive impact and shake should be prevented in transportation. Lay it carefully and lightly and don't invert it.

8.3.2 Don't put it together with dangerous goods during transportation.

8.3.3 Avoid solarization and getting wet in rain and snow during transportation.

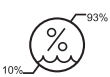
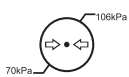
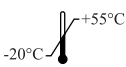
9 Environmental protection

Please dispose according to the local laws.

10 After service

From the date this equipment has been sold, based on the warranty card, we will repair this equipment free of charge if there are quality problems. Please refer to the warranty card for the warranty period.

11 Symbol instruction

CE 0197	CE marked product	SN	serial number
	Date of manufacture		Manufacturer
	Type B applied part		Class Ⅱ equipment
IPX0	Ordinary equipment		Recovery
	Used indoor only		Keep dry
	Handle with care		
	Power on / off		Sound adjustment
	Humidity limitation		Temperature limitation
	Atmospheric pressure for storage		
	Appliance compliance WEEE directive		
	Consult the accompanying documents		
EC REP	Authorised Representative in the EUROPEAN COMMUNITY		

12 European authorized representative

EC REP MedNet GmbH
Borkstrasse 10 · 48163 Muenster · Germany

13 Statement

All rights of modifying the product are reserved to the manufacturer without further notice. The pictures are only for reference. The final interpretation rights belong to GUILIN WOODPECKER MEDICAL INSTRUMENT CO., LTD. The industrial design, inner structure, etc, have claimed for several patents by WOODPECKER, any copy or fake product must undertake legal responsibilities.

14 EMC-Declaration of comformity

The device has been tested and homologated in accordance with EN 60601-1-2 for EMC. This does not guarantee in any way that this device will not be effected by electromagnetic interference Avoid using the device in high electromagnetic environment.

Technical Description Concerning Electromagnetic Emission

Table 1: Declaration - electromagnetic emissions

Guidance and manufacturer's declaration - electromagnetic emissions		
The model Endo Radar is intended for use in the electromagnetic environment specified below. The customer or the user of the model Endo Radar should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The model Endo Radar uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.

RF emissions CISPR11	Class B	The model Endo Radar is suitable for used in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions lEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions lEC 61000-3-3	Complies	

Technical Description Concerning Electromagnetic Immunity

Table 2: Guidance & Declaration - electromagnetic immunity

Guidance & Declaration — electromagnetic immunity			
The model Endo Radar is intended for use in the electromagnetic environment specified below. The customer or the user of the model Endo Radar should assure that It is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) lEC 61000-4-2	±8kV contact ±2, ±4, ±8, ±15kV air	±8kV contact ±2, ±4, ±8, ±15kV 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	±2kV for power supply lines ±1kV for Input/ output lines	±2kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge lEC 61000-4-5	±0.5, ±1kV line to line ±0.5, ±1, ±2kV line to earth	±0.5, ±1kV line to line ±0.5, ±1, ±2kV line to earth	Mains power quality should be that of a typical commercial or hospital environment.

Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % UT (>95% dip in UT.) for 0.5 cycle <5 % UT (>95% dip in UT.) for 1 cycle 70% UT (30% dip in UT) for 25 cycles <5% UT (>95 % dip in UT) for 250 cycles	<5 % UT (>95% dip in UT.) for 0.5 cycle <5 % UT (>95% dip in UT.) for 1 cycle 70% UT (30% dip in UT) for 25 cycles <5% UT (>95 % dip in UT) for 250 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the models Endo Radar requires continued operation during power mains interruptions, it is recommended that the models Endo Radar be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field lEC 61000-4-8	30A/m	30A/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 a.c. mains voltage prior to application of the test level.			

Table 3: Guidance & Declaration - electromagnetic immunity concerning Conducted RF & Radiated RF

Guidance & Declaration - Electromagnetic immunity			
The model Endo Radar is intended for use in.the electromagnetic environment specified below. The customer or the user of the models Endo Radar should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance

Conducted RF lEC 61000-4-6 Conducted RF lEC 61000-4-6 Radiated RF lEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 6 Vrms ISM frequency band 3 V/m 80 MHz to 2.7 GHz	3V 6V 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the models Endo Radar, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance d=1.2×P1/2 d=2×P1/2 d=1.2×P1/2 80 MHz to 800 MHz d=2.3×P1/2 800 MHz to 2.7 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,a should be less than the compliance level in each frequency range.b Interference may occur In the vicinity of equipment marked with the following symbol:
NOTE I At 80 MHz end 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 model Endo Radar is used exceeds the applicable RF compliance level above, the model Endo Radar should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the model Endo Radar. b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.			

Table 4: Recommended separation distances between portable and mobile RF communications equipment and the model Endo Radar

Recommended separation distances between portable and mobile RF communications equipment and the model Endo Radar			
The model Endo Radar is intended for use in electromagnetic environment in which radiated RF disturbances is controlled. The customer or the user of the model Endo Radar can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the model Endo Radar as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150kHz to 80MHz d=1.2×P1/2	80MHz to 800MHz d=1.2×P1/2	800MHz to 2,7GHz d=2.3×P1/2
0,01	0.12	0.12	0.23
0,1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) accordable to the transmitter manufacturer. NOTE I 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.			

Scan and Login website
for more information

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