张连琼 25.11.10

COXO®

User Manual

Dental Electrical Motors

C-Puma Master

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Introduction

- Thank you for purchasing the device.
  For optimum safety and performance, read this manual thoroughly before using the device and pay close attention to warning and notes.
  Keep this manual in a handy place for quickly and easy reference.

Notice

- The trademarks mentioned in this manual are the property of their legally registered companies.
  The file manufacturers, file system names and the file names referred to in this manual are for identification purposes only and are the property of their respective manufacturer or brands.

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Recommended separation distances between portable and mobile RF communications equipment and the device.

The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device 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		
	150 kHz to 80 MHz $d=1.2\times P^{1/2}$	80 Mhz to 800 MHZ $d=1.2\times P^{1/2}$	80 MHz to 800 Mhz $d=2.3\times P^{1/2}$
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) 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.

1 USER INSTRUCTIONS

1.1 User Guide

Requirement

Read these instructions prior to first time use in order to avoid misuse and prevent damage.

Hazard levels

The warning and safety notes in this document must be observed to prevent personal injury and damage to the device. The warnings are as follow:

WARNING:

In cases which–if not prevented–could lead to death or severe injury.

CAUTION:

If not heeded could lead to minor or moderate injury.

NOTICE:

In cases which–if not prevented–could cause damage to the device.

1.2 Target Reader

This document is intended for dentists, dental clinic workers, and service agents.

1.3 Repair Service

For repairs, please contact the manufacturer or authorized dealers.

1.4 Terms and Conditions of Warranty

Within the scope of the applicable manufacturer delivery and payment conditions,the manufacturer guarantees proper function, absence of defects in the device for a period of 24 months from the date of purchase. The date of purchase should be confirmed by the salesperson.

1.4.1 Disclaimer

Manufacturer will not be responsible for accidents, instrument damage, or bodily injury resulting from:

- Repairs made by personnel not authorized by the manufacturer.
- Any changes, modifications, or alterations of its products.
- The use of products or instrument made by other manufacturers, which are not included as approved by the manufacturer. .
- Maintenance or repairs using parts or components other than those specified by the manufacturer and any alterations from original condition of the device.
- Operating the instrument in ways other than the operating procedures described in this manual or resulting from the safety precautions and warnings in this manual not being observed.
- Workplace conditions and environment or installation conditions which do not conform to those stated in this manual such as improper electrical power supply.
- Fires, earthquakes, floods, lightning, natural disasters, or any other unforeseeable forces.

Guidance and manufacture's declaration – electromagnetic immunity

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

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM ban 3 V/m 80 MHz to 2.7 GHz	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands 3 V/m 80 MHz to 2.7 GHz	Portable and mobile RF communications equipment should be used no closer to any part of the instrument, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2xP^{1/2}$ $d=1.2xP^{1/2}$ 80 MHz to 800 MHz $d=1.2xP^{1/2}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). 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:
Radiated RF IEC 61000-4-3	385MHz-5785MHz Test specifications for ENCLOSUREPORT IMMUNITY to RF wireless communication equipment(Refer to table 9of IEC 60601-1-2:2014)	385MHz- 5785MHz Test specifications for ENCLOSUREPORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014)	

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the instrument is used exceeds the applicable RF compliance level above, the instrument should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the instrument.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Guidance and manufacture's declaration – electromagnetic immunity			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of device should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD)IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV,±8kV,±15 kV air	±8 kV contact ±2 kV, ±4 kV,±8kV, ±15 kV air	Floors should be wood, concrete or ceramic tile. If floor 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 ±1 kV for Input/output lines	±2kV for power supply lines ±1 kV for Input/output lines	Mains power quality should be that of atypical commercial or hospital environment.
Surge IEC 61000-4-5	±0.5 kV & ±1 kV differential mode ±0.5 kV, ±1 kV & ±2 kV common mode	±0.5 kV & ±1 kV differential mode ±0.5 kV, ±1 kV & ± 2 kV common mode	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	100 % U_T (100% dip in U_T.) for 0.5 cycle 100 % U_T (100% dip in U_T.) for 1 cycle 30 % U_T (70% dip in U_T.) for 25/30 cycles 100 % U_T (100% dip in U_T.) for 250/300 cycle	100 % U_T (100% dip in U_T.) for 0.5 cycle 100 % U_T (100% dip in U_T.) for 1 cycle 30 % U_T (70% dip in U_T.) for 25/30 cycles 100 %U_T (100% dip in U_T.) for 250/300 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from a unit eruptible power supply or a battery.
Power frequency(50/60 Hz)magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE:U U_T is the a.c. mains voltage prior to application of the test level.			

1.4.2 In Case of Accident

If an accident occurs, the instrument must not be used until repairs have been completed by a qualified and trained technician authorized by the manufacturer.

1.4.3 User Qualifications

Intended Operator Profile

- Qualification: Legally qualified person such as dentists for endodontic instrument operation (it may differs among countries).
- Education and Knowledge: It is assumed the user is thoroughly familiar with root canal measuring and treatment including the prevention of cross contamination.
- Language Understanding: English (Intended for professional use as described above)
- Experience: Experienced person with operating endodontic instrument.

1.5 Transport and Storage

Transport and Storage Temperature: -10 °C to +55°C
Humidity: ≤93% (without condensation)
Atmospheric pressure: 50 kPa to 106 kPa

1.6 Disposal of Medical Devices



In accordance with the principles, standards, and requirements of the country (region) in which you are located. When disposing of the old electrical equipment ensure that pollution is not produced in the process of waste disposal.

2 SAFETY

The instructions for use are a component of the product and must be read carefully prior to use and be accessible at all times.
The device may only be used in accordance with the intended use; any other type of use is not permitted.

2.1 Infection Hazard

Patients, users, or third parties could be infected by contaminated medical devices.

- Take suitable personal protective measures.
- Follow the instructions for using the components.
- Before the initial startup and after each use, reprocess and sterilize the medical device and accessories accordingly.
- Carry out the cleaning and sterilization as described in the instructions for use.
- It is essential to ensure the effectiveness of the cleaning and sterilisztion in the case of deviation in procedure.
- Prior to disposal, the product and accessories must be appropriately reprocessed or sterilized.

2.2 Explosion Hazard Area

Electrical sparks in the product can lead to explosion or fire.

- Do not use product in explosion hazardous areas.
- Do not operate the product in an oxygen-enriched environment.
- Do not use the product near the vicinity of flammable gases.

2.3 Technical Condition

A damaged device or components could injure patients, users,and third

9 GUIDANCE AND MANUFACTURER'S DECLARATION--EMC:

This device needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, and this device can be affected by portable and mobile RF communications device.

Caution:
Do not use a mobile phone or other devices that emit electromagnetic fields, near the device. This may result in incorrect operation of the device.

This device has been thoroughly tested and inspected to assure proper performance and operation!

This device should not be used adjacent to or stacked with other device and that if adjacent or stacked use is necessary, this device should be observed to verify normal operation in the configuration in which it will be used.

Guidance and manufacture's declaration – electromagnetic emission		
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The device 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 emission CISPR 11	Class B	The device is suitable for use in all establishments, including domestic establishments directly connected to the public low-voltage power supply network with specific requirement.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

	Defective LED.	Replace the LED.
	Not a suitable straight and contra-angle handpiece.	Use a suitable light, straight and contra-angle handpiece.
Insufficient torque.	Transmission ratio set incorrectly.	Set the gear ratio to match the handpiece.
	The handpiece resistance is too large.	Recalibrate.
		Change the handpiece
The motor stops automatically	Anto Mode OFF is not set	Enter setting mode, turn on the Anto Mode OFF
Over-heating.	Overheating by extended use under heavy load.	Allow it to cool down before use.
Too fast or slow.	Transmission ratio set incorrectly.	Set the gear ratio to match the handpiece.
	Need recalibrate.	Recalibrate.
E1	The foot control is pressed before opening the device	Release foot control
E2	The load exceeds the maximum output of the device	The motor stops automatically, need to reduce load
E3	Abnormal motor	Turn off the device and restart
E5	Overheating protection	The motor stops automatically, need to reduce load
E6	Abnormal communication	Resume after communication

The Contra-angle and Motor handpiece are not field-repairable. If problem cannot be solved, please contact local dealer or our company

parties. A damaged power cable or missing protective conductor can lead to electrical shock.

- Only operate devices or components if they are undamaged on the outside.
- Check the power cable before use.
- Connect only to sockets with a protective contact that meet the respective national regulations.
- Check the proper working order and proper condition of product and accessories before each use.
- Have parts with sites of breakage or surface changes checked by the authorized service personnel.
- Safety checks may only be performed by trained service personnel.
- Perform a test run with the handpiece before each use.
- If any of the following defects on the product or accessories occurs, stop using the device and have a service representative carry out repair work:
  - Malfunctions
  - Damage
  - Irregular operating noise
  - Excessive vibration
  - Overheating
  - Dental bur or diamond grinder is not firmly locked in the handpiece
- Power supply and cable/hoses need to be set-up/routed appropriately such that they are not on the floor.

2.4 Ingress of Liquids

Use of the product in moist or electrically conductive environments can lead to electrical shock and injury to patients, users,and third parties.

- Only use the product in dry environments.
- Use the product only in environments that are not electrically conductive.
- Prevent liquid from entering the openings of the product.
- Do not place the product in long or narrow containers.

- If any liquid is detected on the device, disconnect the power cable immediately and do not touch the product.
- Make sure that the surface of the product is absolutely dry before plugging the power cable back in the socket.
- After interventions on and repairs of the device and before re-use, have the service personnel perform safety checks on the device.

2.5 Accessories and Combinations with Other Equipment

Use of unauthorized accessories or unauthorized modifications of the device could lead to injury.

- Only use accessories that have been approved for combination with the product by the manufacturer.
- Only use accessories that are equipped with standardized interfaces.
- Do not make any modifications to the device unless these have been approved by the manufacturer of the product.

2.6 Qualification of Personnel

Application of the product by users without the appropriate medical training could injure the patients, the users,or third parties.

- Make sure that the user has read and understood the instructions for use.
- Only employ the device if the user has the appropriate medical training.
- Observe national and regional regulations.

Improper use of handpieces can cause injuries.

You need to comply with the following guidelines to ensure the safe use of the electrically- driven handpieces:

- Observe national and regional regulations.

Improper use of handpieces can cause injuries.

You need to comply with the following guidelines to ensure the safe use of the electrically- driven handpieces:

- Follow the instructions for use of the respective handpiece.

8 TROUBLESHOOTING

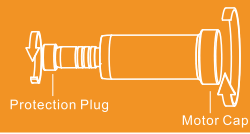
Malfunction	Cause	Remedy
Non-funotional device	The unit is switched off	Switch-on the mains switch on the rear of the unit
	Neither end of the power cable is plugged in	Plug in the power input cable
The motor does not run	Insufficient air pressure	Minimum pressure:0.03-0.10Mpa Maximum pressure:0.20-0.35Mpa
	Motor connection is loose.	Check connection
	Overload.	Check handpiece if it stuck
No spray water or cooling air	No spray water or cooling air pre-selected	Pre-select spray water or cooling air
	Internal parts failure	Contact dealer
Spray water Insufficient	Spray nozzles are crusty or soiled	Clean the spray nozzles with the nozzle needle or re-process the part
The motor makes a grinding noise or does not run smoothly	The motor is not correctly plugged on or screwed on	Check if all the connections and couplings are firmly seated
Torque calibration failed	The motor is not installed in place	Reinstall the motor correctly
	Contra-angle/motor failure	Replace the bending machine/motor
No light on the contra-angle handpiece	The light is not turned on	Turn on the light
	The contra-angle handpiece is improperly attached	Attach contra-angle handpiece until the catch audibly locks

	Maximal sterilization temperature: 137°C.
Storage:	Storage of sterilized instruments in a dry, clean and dust free environment at modest temperatures, refer to label and instructions for use.
Reprocessing validation study information	The following test devices, materials & machines have been used in this valdition study: Detergent: 0.5% neodisher® Mediclean Forte (Dr. Weigert) Washer / Disinfector: Miele PG8581 Program: Vario TD Dental

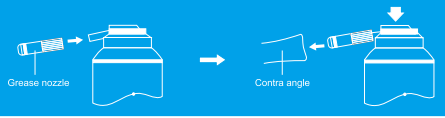
Additional Instructions: None

It is the duty of the user to ensure that the reprocessing processes including resources, materials and personnel are capable to reach the required results. State of the art and often national law requiring these processes and included resources to be validated and maintained properly.

- Screw the Motor Cap to the Motor and the protection plug to the Motor connection.



- Recommends lubrication the product as part of the processing after each use, i.e. after each cleaning, disinfection, and before each sterilization.
- Contra angle lubrication, follow the next step:
  1) Remove the bur.
  2) Plug the product onto the grease nozzle, and press the spray button for 2-3second.



- Check the speed setting each time you turn on the device.
- Comply with the permissible maximal speed and maximal contact pressure of the tools as specified by the tool manufacturer.
- Comply with the servicing instructions for handpieces as specified in the respective instructions for use.
- Never press the push-button during operation of the device.
- Never use the push-button to lift the cheek or tongue.

If the transmission ratio selected on the device differs from the transmission ratio of the dental instrument, the files may rotate too fast and cause injury.

- Make sure that the handpiece you use and the setting of the transmission ratio are consistent.

Improper use of tools, e.g. wrong drill length and files,can cause injuries.

- Follow manufacturer's instructions (mode of operation, speed, torque levels, torsion resistance, etc.), and use the files according to their intended use.

2.7 Electromagnetic Fields

Electromagnetic fields might interfere with the functions of implanted systems (such as pacemakers).

Medical electrical devices are subject to special precautions regarding electromagnetic compatibility and must be installed and operated in accordance with the tables of electromagnetic compatibility. **See also: 9**

Information about electromagnetic compatibility

High-frequency communications devices may interfere with medical electrical devices.

- Ask patients if they have a cardiac pacemaker or other system implanted before you start the treatment.
- Comply with the tables of electromagnetic compatibility during installation and commissioning.
- If the device needs to be used in the immediate vicinity of other equipment, monitor the device or system for malfunctions.

3 DESCRIPTION OF THE PRODUCT

The Dental Electrical Motor is a stand-alone system for operating electrically-driven handpieces. External power supply provides electric power to the unit. The 4-hole tubing connected to the unit supplies chip / cooling air, water and pressure signal. The electrical low-voltage motor is connected onto the specific tubing of the device. The converted pneumatic output signal (electrical energy) from a dental treatment center drives the motor to operate an electrically-driven dental handpiece. The speed of the electric handpiece is controlled by air pressure of the dental treatment center. The control unit is positioned close to a treatment unit at the location preferred by the dentist. The device system consists of a base unit with a motor hose, an electrical motor, an adaptor, and a power cord.

3.1 Intended Use

This device is intended to convert pneumatic output from a dental treatment center to electrical energy to drive the motor handpiece and the LED motor for operation of electrically-driven dental handpieces.

This device is designed for use by a trained professional in the field of general dentistry.

3.2 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 device.

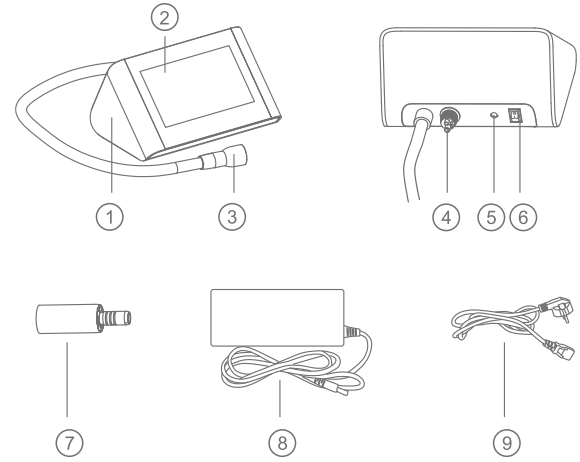
The device should not be used for severely curved root canal preparation.

Do not use the device for implant or any other dentist procedure outside endodontic.

Cleaning:	Put the instuments into the maschine on a tray and start the program • 1 min pre-washing with cold water (<40°C) • emptying • 10 min washing with a mild alkaline cleaner at 55°C • emptying • 1 min rinsing • emptying
Disinfection:	Automated Disinfection: Automated Thermal Disinfection in washer/disinfector under consideration of national requirements in regards to A0-Value (see EN 15883). A disinfection cycle of 5 min disinfection at 93°C has been validated for the device to achieve an A0 value of 3000.
Drying:	Automated Drying: Drying of outside of instrument through drying cycle of washer/disinfector. If needed, additional manual drying can be performed through lint free towel.
Functional Testing, Maintenance:	Visual inspection for cleanliness of the instruments and reassembling. Functional testing according to instructions of use. If necessary, perform reprocessing process again until instrument is visibly clean.
Packaging:	Pack the instruments in an appropriate packaging material for sterilization. The packaging material and system refer to EN ISO 11607.
Sterilization:	Sterilization of instruments by applying a fractionated pre-vacuum steam sterilization process (according to EN 285 / EN 13060 / EN ISO 17665) under consideration of the respective country requirements. Minimal requirements: 3 min at 134 °C. In EU, 5 min at 134 °C is required.

Instructions for cleaning, disinfecting and sterilizing Electrical Motor and Contra-angle	
Device:	Dental electrical motor, part • Motor • 6:1 Contra_angle
Advice:	Reprocessing procedures have only limited implications to a surgical instrument. The limitation of the numbers of reprocessing procedures is therefore determined by the function / wear of the device. There is no limit of maximum allowable reprocessing cycles. The device should no longer be reused in case of signs of material degradation. In case of damage the device should be reprocessed before sending back to the manufacturer for repair.
Reprocessing Instructions	
Preparation at the Point of Use:	Remove gross soiling of the instrument with cold water (<40°C) immediately after use. Don't use a fixating detergent or hot water (>40°C) as this can cause the fixation of residuals which may influence the result of the reprocessing process. Store the instruments in a humid surrounding.
Transportation:	Safe storage and transportation to the reprocessing area to avoid any damage and contamination to the environment.
Preparation for Decontamination:	The devices are to be reprocessed in a suitable reprocessing area.
Pre-Cleaning:	No pre_cleaning is required for these devices.
	Automated Cleaning: Use a washer-disinfector meeting the requirements of the ISO 15883 series.

3.3 Device Overview



Pos. no.	Description
①	Control Unit
②	Touch Screen
③	Motor Hose
④	4(2)-hole Standard Connector
⑤	Power Supply Jack
⑥	Power Switch
⑦	Electrical Motor
⑧	Adaptor
⑨	Power Cord

Adaptor output	29VDC 4A
Control Unit	
Control unit length	161mm
Control unit width	126.5mm
Control unit height	90mm
Operating temperature:	+5°C to +40°C
Operating humidity	20% to 80%
Operating atmospheric pressure	80 kPa to 106 kPa
Mode: intermittent operation	
Operating time	40s
Pause time	10min
Electrical Motor	
Water hardness	8.4 to 12 °dH
PH	7.2 to 7.8
System pressure	2.0 to 5 bar
Spray air	1.0 to 2.5 bar
Spray water	0.8 to 2.0 bar
Cooling water	> 50Ml/min
Cooling air exit at the motor coupling	6-9 NL/min
Speed	2000 - 40,000 min-1 (rpm)
Torque output	2 Ncm
Motor cabling lengths	1.65 m
Degree of Protection against Electric Shock	Type B applied part
Light iluminance	More than 7000Lux
Air pressure:	0~350kPa
water pressure:	50~300kPa
Spray water pressure:	1.0~2.5bar
Spray air pressure:	0.8~2.0bar

	Ensure only minimal cleaning agent enters the cavity that houses the electrical pins. Immediately absorb excess fluid with a dry disposable towel. 3.Wipe the devices with a sterile, clean, lint-free cloth that is well dampened with deionized water for 30 seconds to remove all disinfecting agent. Pay special attention to all seems, especially around the motor house and surrounding crevices. Ensure cloth is damp with deionized water for the entire 30 seconds. Discard used cloth and repeat rinsing with a new, second dampened cloth for 30 seconds. Discard second cloth and rinse with a new, third dampened cloth for a final 30 seconds. 4.Wipe device with a fourth dry, sterile lint-free cloth to remove all fluid. 5.Allow the devices to air dry for at least 5 minutes
Packaging:	No particular requirements.
Sterilization:	Sterilization is not allowed. Do not subject components to Steam autoclaving or liquid chemical sterilant immersion. Component damage will occur.
Drying:	Wipe the devices dry with a sterile, clean, lint-free cloth. Allow the components to fully air dry before storage.
Maintenance, Inspection and Testing:	Visually inspect to ensure that all contamination has been removed. Visually inspect power supply and motor cord for damage. Components that are damaged, worn, or distorted should be discarded and replaced.
Storage:	Store the components at room temperature, away from moisture or excessive humidity.

7 CLEANING, DISINFECTION AND STERILIZATION

Instructions for Cleaning and Disinfecting Control Unit and Motor tube	
Caution:	Do not use automated washer/disinfectors for reprocessing all the parts. Component damage will occur. They have to be manually cleaned.
Cleaning:	1.Scrub with an impregnated wipe or disposable towel soaked with an alcohol-based, tuberculocidal, until it is free of visible residues. 2.Special Note: use care when cleaning the mating surfaces of the motor house and Control Unit. Use only a moist impregnated towel. • For the motor house: Vigorously scrub the area near the motor house with a fresh wipe. Ensure fluid covers motor house and surrounding crevices. • Avoid liquid entering the device to avoid short circuit or failure. 3.Remove cleaning solution residue with a damp cloth. 4.Allow the devices to air dry for at least 5 min.
Disinfection:	1.After cleaning, wipe all device surfaces with a new single-use cloth in combination with an alcohol-based, tuberculocidal, quaternary ammonium solution, 5 minute contact time, use according to disinfectant solution manufacturer`s Instruction for Use. Ensure direct contact of device and disinfectant by pressing the wet wipes on the device after half of the required contact time. 2.Use fresh wipes to disinfect the probe motor house and surrounding crevices area mating seam for the entire contact time. Use care to ensure cleaning agent is applied only to the top of the cavity interior.

3.5 Symbols on Product and Specification Plate

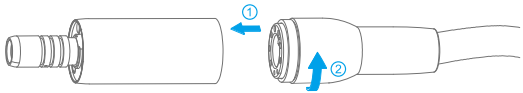
	Warning		Note
	Caution		Manufacturer
	European Union agent		Serial number
	Type B applied part		Keep dry
	CE marked product		Fragile
	Vertical up		Direct current
	Thermo-Disinfector		Autoclave
	Special disposal of waste electrical and electronic equipment (Directive2002/96/EEC)		Refer to instruction manual / booklet
	CE Marking		

4 INSTALLATION

4.1 Connecting the Motor

Connect electrical motor to motor hose and twist.

Screw tight the hose-side union nut proceeding in the direction of the arrow.

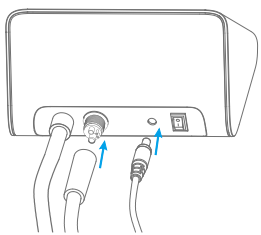


- The correct attachment position is attained automatically.

4.2 Connecting the Control Unit

Connect 4-hole turbine hose of the dental unit to 4-hole standard connector of control unit.

Insert the adaptor plug into the power supply jack of control unit.



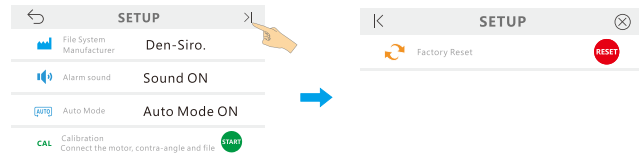
▸ If the turbine hose of the dental unit has a 2-hole or 6-hole connector, replace the hose with a 4-hole hose.

6.2 Factory Reset

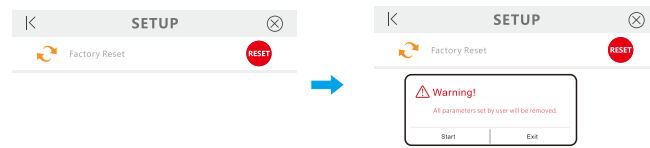
▸ If a Factory reset is performed, all parameters set by the user will be removed.

▸ Factory reset can be performed in PREN mode or ENDO mode.

- Enter SETUUP in either mode;
- Enter FACTORY RESET state by pressing " ⏭ ";



- Press " RESET " to enter the next step, or press "⊗" to exit;
- Press " Start " to confirm to start the factory reset, or press "Exit".



- After the reset is completed, the system automatically exits SETUP state.

3.4 Technical Specifications

Adaptor	
Adaptor input	100V-240V ~ 50/60Hz

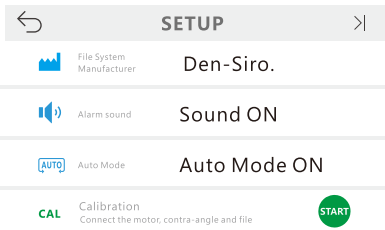
6 CALIBRATION AND FACTORY RESET

6.1 Calibration

Calibration is required to ensure the motor parameters are accurate.

Calibrate the instrument at the following times:
- Whenever the contra angle has been replaced.
- When using a contra angle other than the one that has been calibrated.
- The contra angle after the contra angle has been sterilized or exchanged.
- Calibration is recommended before each treatment.

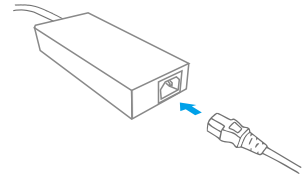
- In ENDO mode, Press " ⚙ " to enter SETUP;
- Connect the Motor, Contra Angle, and File;
- Press " Start ", to begin the calibration process;
- Display " OK ", indicates calibration is complete;
- Display " Fault! ", indicates calibration failure.



⚠ If the calibration fails, please refer to **8. Troubleshooting**. If it still cannot be resolved, please contact your local dealer for assistance.

4.3 Connecting the Power Supply

Use the power cord to connect the adaptor and power supply.



4.4 Connecting Contra Angle and File/Bur

For PREP mode:

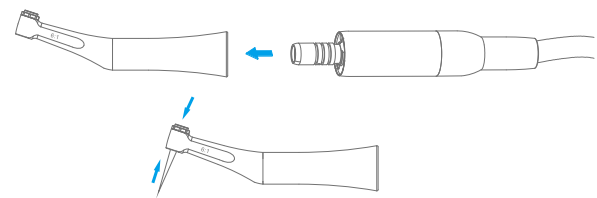
Align the contra angle interface with the motor connector, and slide it in until it clicks securely into place.

All straight and contra-angle handpieces with the motor connection ISO 3964 can be attached.

For Endo mode:

- Align the contra angle interface with the motor connector, and slide it in until it clicks securely into place.
- Hold down the push button on the contra angle and insert the file.

In this mode, only 6:1 contra angle can be used, otherwise it will cause damage to the device.
Contra-angle compatible with rotary and reciprocating files, with a 2.35 mm shaft conforming to ISO 1797-1:2011, Type 1.



5 OPERATION

- Property damage due to incorrect pressures , set the pressures according to the technical specifications.
- Make sure that the compressed air is dry and free of dirt and oil according to EN ISO 7494-2.
- Make sure that the pH of the water is between 7.2 to 7.8.
- Power supply and cable/hoses need to be set- up/routed appropriately such that they are not on the floor.

- Spray air and water from the device for at least 20 seconds before treating a patient.

5.1 Switching the Device on/off

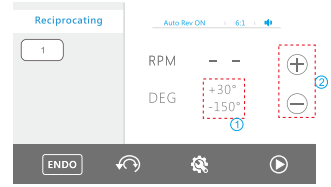
Press the switch to turn on the device, the unit is ready for operation, Press power switch again to turn off.

5.2 Operation Modes

The device has 2 modes:

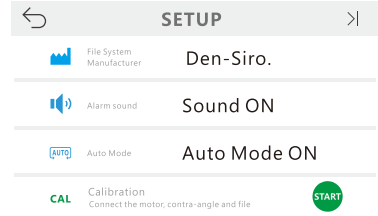
- **PREP** : Dental aesthetic restoration tooth preparation, crown cutting, opening of pulp chamber. Caries removal and polishing.
- **ENDO** : Enlarge and shape the root canal.

Press **Mode button** to toggle between PREP mode or ENDO mode.



5.4.6 SETUP

Press " " to enter the SETUP.



- Press " " to exit the setting page, press " " to enter the next page.

Functions	Options	Description
File System Manufacturer	SOCO,users, etc.	Users can select different manufacturers according to their needs
Alarm sound		Turn on or off the sound
Auto Rev		Turn on or off the Auto Reveres function, refer **5.4.4 Auto Reverse**
CAL Calibration	/	Please refer **6. Calibration and Factory Reset**

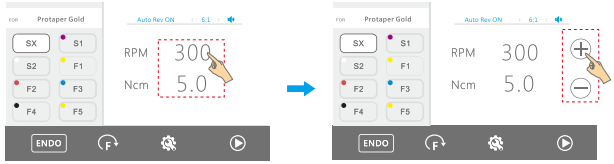
5.4.5 Adjustment

- While the motor handpiece is in motion, speed and torque cannot be changed.
- If using a reciprocating rotary file, speed and torque cannot be changed.

a) Continuous rotary file

User can change the default speed or torque value:

- Press the speed or torque value on the screen, the value flashes;
- Press " ⊕ "/" ⊖ "increase or decrease the value;
- The change will be saved automatically. Press the blank area of the screen to exit the setting status.



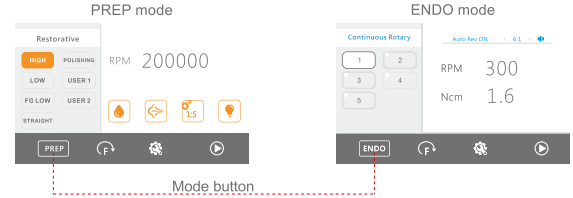
- To return to default settings refer to chapter **6.2 Factory Reset** .
- When the default setting is changed, RPM(Ncm) will become RPM (Ncm) .

RPM 350
Ncm 4.5

b) Reciprocating rotary file

In the user reciprocating system, user can change rotation angle.

- Press the angle value on the screen, the value flashes.
- Press " ⊕ "/ " ⊖ " to choose an available value.
- The change will be saved automatically. Press the blank area of the screen to exit the setting status.



5.3 PREP Mode

- Make sure that the handpiece you use and the setting of the transmission ratio are consistent.

- The connection method in this mode is shown in **chapter 4 of installation**.

5.3.1 Select Program

There are 7 programs in this mode, including two programs that are named: user1, user2.

Users can select different programs by touching the **Program name button** according to their needs.

The default settings of the programs:

Program name	Description	Transmis-sion ratio	Speed	Spray water	Cooling air	LED light
HIGH	High speed	1:5	200000	√	√	√
LOW	Low speed	1:1	4000	√	√	√
FG LOW	Friction-grip (FG) bur low speed	1:5	2000	√	√	√
STRAIGHT	Straight handpiece	1:1	4000	√	√	√
POLISHING	Polishing	6:1	500	×	×	×

▸ User can modify the default settings; see **5.3.4 Function options** and **5.3.5 Change speed**.

5.3.2 Start Working

Via Touch screen

Long press " ⊙ " to start the motor and press again to stop it.

⊙ turns to ⊙ when the motor is working.

Via Foot pedal

Press the Foot pedal of the dental unit to start working and release it to stop.

The foot pedal has two methods to control the motor: Switch and Linear, please refers to **5.3.6 SETUP**.

5.3.3 Rotary Direction

Press Direction button to change the direction of motor rotation.

- (F) Forward, the File rotates clockwise.
- (R) Reverse, the File rotates counterclockwise.

▸ When the motor restarts, it will automatically return to forward rotation.

5.3.4 Function Options

Users can choose different options in spraying water, cooling air, transmission ratio and LED lights.

5.4.3 Rotary Direction

Press **Direction button** to change the direction of motor rotation.

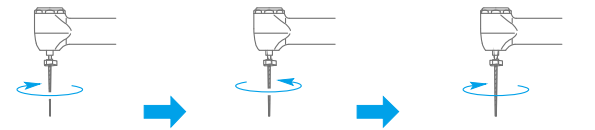
- (F) Forward, the File rotates clockwise.
- (R) Reverse, the File rotates counterclockwise.
- Reciprocating motion, clockwise angle rotates less than the counterclockwise angle.
- Reciprocating motion, clockwise angle rotates more than the counterclockwise angle.

5.4.4 Auto Reveres

▸ In reciprocating motion, the auto reverse function is disabled.

Auto reverses on:

During operation, the load reaches the preset torque limit value, the motor handpiece will automatically rotate in the reverse direction. When the load is removed, the motor handpiece returns to normal forward rotation automatically.



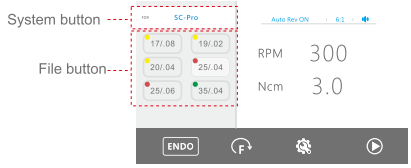
Load within the torque limit value

Load beyond the torque limit value

When the load is reduced, the motor is automatically restored

Auto Reverses Off:

During operation, the load reaches the preset torque limit value; the motor handpiece will stop without reverse rotation.
If you want the file to rotate forward again, press the" ⊙ "button once.



- The default speed or torque value can be modified, and the changed value will be automatically saved. Please refer to **5.4.5 Adjustment**.
- Some files are designed specifically for use in reciprocation. If one of above mentioned reciprocating files has been chosen, the speed value display "— —".

5.4.2 Start Working

Via Touch screen

Long press“ ▶ ” to start the motor and press again to stop it.

▶ turns to ■ when the motor is working.

Via Foot Pedal

Press the foot pedal of the dental unit to start working and release it to stop .

- If the contra angle's file release button is pressed against the teeth opposite the one being treated, the file could come out and injure the patient. Before use, run the instrument outside the oral cavity to make sure it is operating normally.
- Never use excessive force to advance the file down the root canal.
- If you encounter resistance or the auto torque reverse is triggered, back the file up 3 or 4 mm and carefully advance it down the root canal again. Or replace the file with a smaller size. Never use excessive force.
- Do not force the file down the root canal or press it against the root canal wall.

Function	Option	Description
Spray water		Turn on or off the spray water
Cooling air		Turn on or off the cooling air
Transmission ratio	1:1 1:5 4:1 16:1 10:1 20:1	Select contra angle's gear ratio
LED light		Turn on or off the LED light

- Transmission ratio refers to the speed ratio of contra angle.

5.3.5 Change Speed

- Press the speed value on the screen, the value flashes;
- Press “ ⊕ ”/“ ⊖ ” increase or decrease the value;
- The change will be saved automatically. Press the blank area of the screen to exit the setting status.



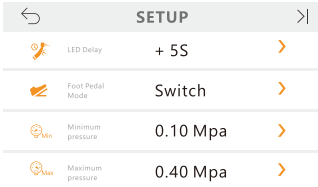
- To return to default settings refer to chapter **6.2 Factory Reset**
- When the default setting is changed, RPM will become RPM.

RPM 180000

5.3.6 SETUP

Press " ⚙ " to enter the SETUP.
Select the required parameters by pressing " › "

> ▸ Press " ⮌ " to exit the setting page, press " ›| " to enter the next page.



Change the setup parameters, see the table below for details.

Functions	Options	Description
LED Delay	0S, +5S, +10S	The time that the LED continues to light after the motor stops.
Foot Pedal Mode	Switch / Linear	**Switch:** The motor starts at full speed when the foot pedal is actuated. **Linear:** The motor speed can be adjusted continuously up to the maximal level using the foot pedal.
Minimum pressure	0.03Mpa-0.10Mpa	Minimum air pressure required for motor start
Maximum pressure	0.20Mpa-0.35Mpa	Air pressure when the motor reaches maximum level

5.4 ENDO Mode

> ▸ In this mode, only 6:1 contra angle can be used!

- Follow the manufacturer's instructions for use of endodontic files.
- Do not use files designed for reciprocating motion in continuous rotary file mode.
- The File system shown on the display must always match the File in use.
- Torque values show on the display are accurate and reliable only with contra angle properly maintained and lubricated.

- The connection method in this mode is shown in chapter **4 Installation**.
- Calibration is recommended when using a new contra angle, the detailed calibration methods,please refer to **6.1 Calibration.**

5.4.1 Select File System and File

The device contains an endodontic file library and preset parameters based on information provided by the file system manufacturer.
The library contains File systems from some manufacturers, including two user systems: **Continuous Rotary** and **Reciprocating**.

> ▸ The manufacturer reserves the right to update the file library.

To select the File system and file, follow the steps below:

- Select endodontic file manufacturer, refer to **5.4.6 SETUP**.
- Select the File system under the manufacturer, by pressing **System button**.
- Select the file under the File system, by pressing **File button**.