Foshan COXO Medical Instrument Co.,Ltd
Address:BLDG 4,District A,Guangdong New Light Source Industrial Base,
Langsha Luocun,Shishan Town,Naihai District,Foshan City,
Guangdong Province,China
Tel:0086-757-81800058
Fax:0086-757-81800058
E-mail:coxotec@163.com
Http://www.coxotec.com

EC REP
Wellkang Ltd.
Address:Suite B,29 Harley Street,London W1G9QR,
United Kingdom

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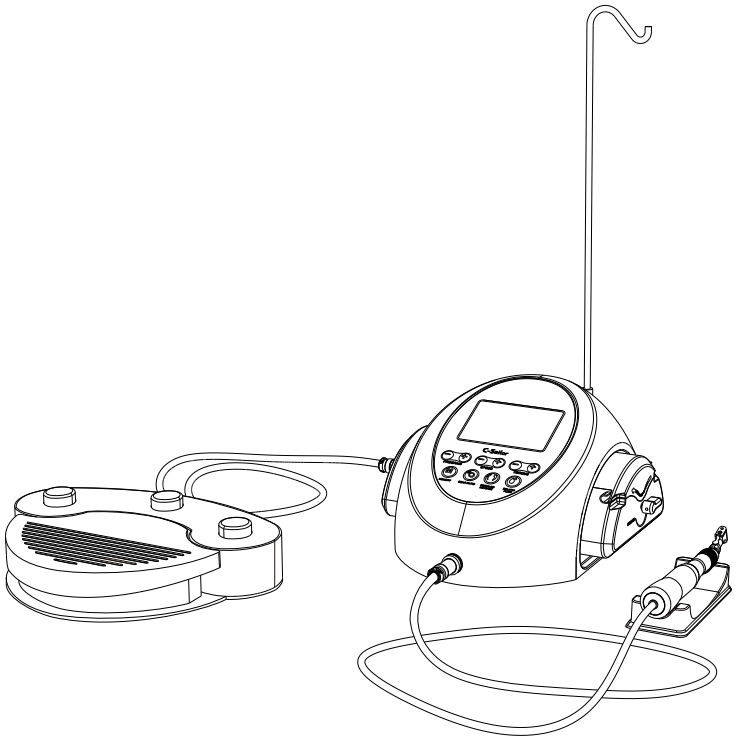
C-Sailor

DENTAL IMPLANT MOTOR SYSTEM

OPERATION MANUAL

Please read this Operation Manual carefully before using, and filing for future reference.



CE 0197

Thank you for purchasing the COXO C-Sailor dental implant motor system.
We recommend that prior to use, you read this document carefully regarding instructions for using, handling method, or maintenance check so that you can carry on using the unit in the future.
In addition, please keep this operation manual in a place where a user can refer to it at any given time.

◆Classification of equipment

- Type of protection against electric shock :
  -Class I equipment
- Degree of protection against electric shock :
  -Type B applied part
- Method of sterilization or disinfection recommended by the manufacture :
  -See 7. Cleaning, disinfection, packing and sterilization
- Degree of protection against ingress of water as detailed in the current edition of IEC 60529 :
  -Foot Control: IPX7 (Protected against the effects of 30 minutes' immersion in water)
- Mode of operation :
  -Intermittent operation(ON 2 min/OFF 10 min)
  -The Implanted is designed for intermittent operating mode with an operating time of 2 minutes and an idle time of 10 minutes. If the operating mode specified is observed no overheating of the system and therefore no injury to the patient, user or third persons arises.
  -Not to position the ME equipment so that it is difficult to operate the disconnection device.

Indications:

- Missing a tooth, multiple teeth, the teeth of all patients.
- Mandibular alveolar absorb all full mouth, wearing the traditional full mouth dentures is difficult, is not good, wear is not strong person.
- Wear traditional dentures fixed differential, non-functional mucosa can not endure.
- For dentures aesthetics, function special requirements.
- Remaining teeth missing teeth around the problem, can not do the traditional dentures.

Contraindications:

- Systemic diseases (cancer, cardiovascular diseases serious diseases, the blood system, the immune system The disease, ...).
- Ongoing and topical treatment of certain systems (anticoagulant therapy, chemotherapy, radiotherapy, ...).
- Poor quantity and quality of bone.

⚠ Cautions for operation

■Read these safety cautions thoroughly before use and operate the product properly.

■These indicators are to allow you to use the product safely, prevent danger and harm to you and others. These are classified by degree of danger, damage and seriousness. All indicators concern safety, be sure to follow them.

Classification	Degree of Danger or Damage and Seriousness
⚠ WARNING	Explains an instruction where personal injury or physical damage may occur.
⚠ CAUTION	Explains an instruction where minor to medium injury or physical damage may occur.
⚠ NOTICE	Explains an instruction that should be observed for safety reasons.

1. Safety precautions prior to use

Read Handpiece's Operation manual carefully before use.

INTENDED TO USE

C-Sailor is intended for use in dental oral surgery and surgical procedures by qualified personnel.

⚠ WARNING

The system may present a possibility of malfunction when used in the presence of an electromagnetic interference wave. Do not install the system in the vicinity of the device which emits magnetic waves. Turn off the power switch of the Control Unit of this system when an ultrasonic oscillation device or an electrode knife is located in the vicinity is used.

⚠ CAUTION

- C-Sailor needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information.
- Portable and mobile RF communications equipment can affect C-Sailor. Do not use RF equipment outskirts for the product.
- The use of accessories, Motors and cables other than those specified, with the exception of Motors and cables sold by the manufacturer of C-Sailor as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the Control Unit.
- C-Sailor should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the Control Unit should be observed to verify normal operation in the configuration in which it will be used.
- When operating this system always consider the safety of the patient.
- Read this Operation Manual before use, and fully understand the functions of each part for operation key.
- Do not attempt to disassemble the Control Unit /Foot Control / Micromotor nor temper with the mechanism.
- Check for vibration, noise and overheating before use and if any abnormalities are found in use, stop using immediately and contact your dealer.
- Use an electrical outlet that is grounded.
- Do not drop, hit, or subject to excessive shock.
- Do not bend the Irrigation Tube while the water pomp is operating. It could cause tube breakage.
- Do not use bent, damaged or sub-standard burs. The Shank could bend or brake.
- Do not exceed the recommended speed.
- After each Operation, be sure to lubricate and sterilize the handpiece as soon as it's cleaned. Blood coagulation can cause corrosion and rusting. However, do not lubricate the Micromotor. Oil could generate excessive heat and cause damage.
- The Control Unit can be cleaned with a moist cloth. Disconnect the power supply before cleaning. The Control Unit and the Foot Control cannot be sterilized by any method.
- When the product is very frequently used, consider the maintenance of a small stock of replaceable parts.
- Do not disconnect the Motor Cord from the motor.
- Do not wipe with or, clean or immerse in, high acid water or sterilizing solutions.
- Follow the table below for the motion time of motor and handpiece. Continuous use over a long time may cause the overheating of the handpiece, which in turn may result in an accident.
- Applied parts for patient and/or operator is Handpiece.

⚠ NOTICE

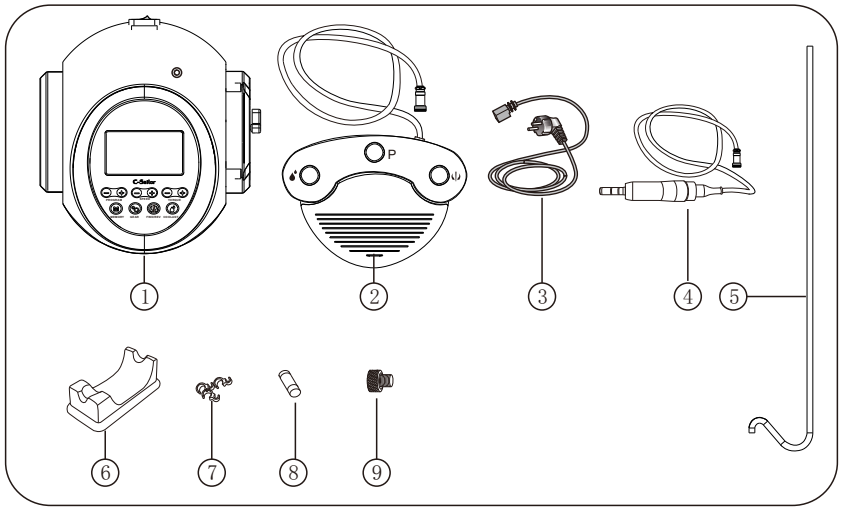
- Turn off the Main Power Switch after each use.
- For service requirements and spare parts contact your dealer.
- The use of COXO genuine pre-sterilized, disposable Irrigation tube Kit is recommended.

	Temperature	Humidity	Atmospheric pressure
Use	Between 0-40˚C (32-104˚F)	Between10-85%RH	Between 700-1060hPa
Store Transportation	Between -10-55˚C(14-131˚F)	Between 10-85%RH	Between 500-1060hPa

** No moisture condensation in the Control Unit.

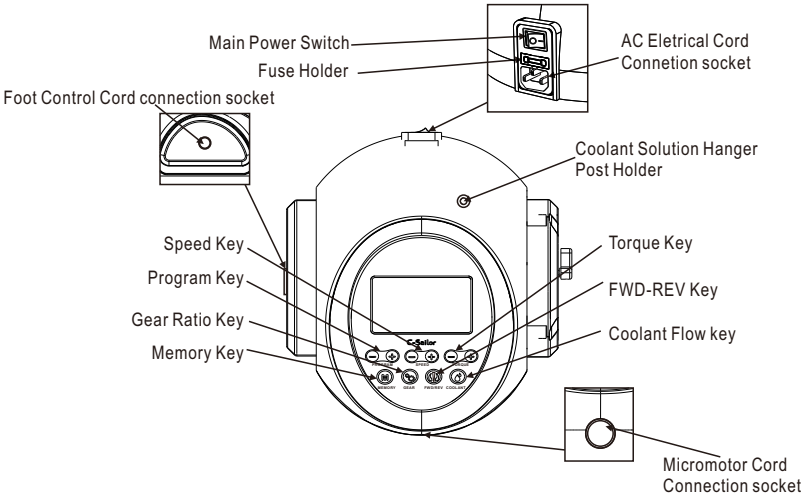
** Using at outside of these limits may cause malfunction.

2. Package Contents



Item No.	Description	Quantity
①	Control Unit	1
②	Foot Control with Cord(2M)	1
③	AC Electrical Cord(1.5M)	1
④	Optic Motor/Non-Optic Motor(with Motor Cord)	1
⑤	Coolant Solution Hanger Post	1
⑥	Handpiece Stand	1
⑦	Tube Holder	8
⑧	Spare Fuse	1
⑨	Prevent steam bolt	1

3.Control Unit with an Irrigation Pump



Description of Operation

◆Keys on the Control Unit

(1) Program Key

Use to Cycle through available programs. Press [+] key to ascend and [-] key to descend program number. You will find all program numbers sequentially by pressing keys.

(2) Speed Key

Use to set the Micromotor speed. Press [+] key to increase, and [-] key to decrease speed. (When the upper and lower speed limits are reached an audible alarm 'beep' is sounded).

(3) Torque Key

Use to set the torque range. Press [+] key to increase and [-] key to decrease torque range. (When the upper and lower torque range limits are reached an audible alarm 'beep' is sounded). The torque range setting should be selected according to the attached handpiece gear ratio.

(4) Gear Ratio Key

Use to set gear ratio of the attached handpiece before use. Repeat press this key until the LCD display indicates the correct gear ratio of the handpiece.

(5) Coolant Flow Key

Use to select 6 levels of coolant solution flow from 0 to 5, repeat press key to cycle through coolant flow levels.

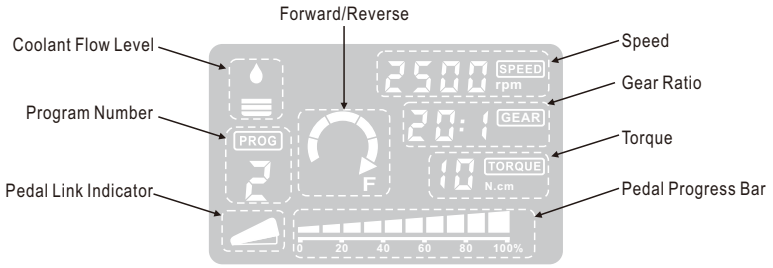
(6) FWD-REV Key

Use to select the direction of rotation. Press this key once to change the rotational direction. (Once in reverse the Control Unit audibly warns with a 'beep')

(7) Memorize Key

Use to memorize the program parameters set by the operator. Press this key once to memorize parameters. When beep sounds, the new program parameters have been memorized.

LCD display on the Control Unit Console



(1) Coolant Flow Level

Displays the selected coolant solution flow level; the selected Flow level is indicated by 1 to 5 levels of illuminated indicators. No illumination indicates when the Coolant Solution Flow is off.

Position	0	1	2	3	4	5
Flowrate	0	50mL	60mL	75mL	85mL	100mL

(2) Program Number

Displays the selected program number.

(3) Gear Ratio

Displays the selected gear ratio of the handpiece.

(4) Forward/Reverse Indicator

Displays the selected direction of the Micromotor.

(5) Speed

Displays the selected speed.

Depressing Foot Control:Rotation speed of the motor displayed on the LCD (Assuming the correct gear ratio is selected)

Without pressing Foot Control : Max Rotation preset setting displayed on the LCD

(6) Torque: Displays the selected torque.

* When using the 1:1 direct drive or Speed increasing handpiece, the torque is not displayed. (This function is appropriate for 4:1 increase speed handpiece or more)

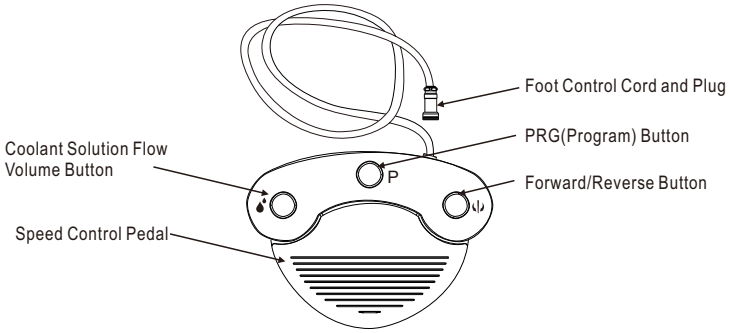
(7) Pedal Link Indicator

Displayed when the foot is connected, it is not displayed when the pedal is not connected.

⚠ CAUTION

The LCD display panel is produced from liquid crystal and should always be treated with care.

4.Foot Control



(1) Coolant Solution Flow Volume Button

Use to select 6 levels of coolant solution flow from 0 to 5; each level may be increased by one step pressing this button. If you press this button in level 5, it returns to level 0.

(2) PRG (Program) Button

Use to select the desired program number. Program numbers will always ascend each time this button is pressed and released.

(3) Speed Control Pedal

Used to start and stop the Micromotor and to control the speed during operation. The Micromotor operational speed is directly proportional to the position of the foot control, up to the preset maximum.

(4) Forward/Reverse button

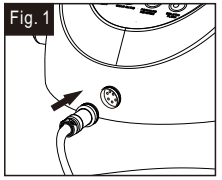
Used to change the rotational direction of the Micromotor. Push once to change the rotational direction.

5. Installation

5-1 Connecting the Motor Cord

Plug the Motor cord into the motor interface of the main unit, fasten the Fixed nut after that. When remove the motor cord, loosen the fixed nut, pull out the plug from the interface.(Fig. 1)

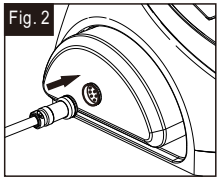
Fig. 1



5-2 Connecting the Foot Control

Face the screw on the Foot Control Cord Plug downward then insert the plug into the Foot Control Cord connector socket on the Control Unit. Secure the plug by fastening the Lock Nut.(Fig. 2)

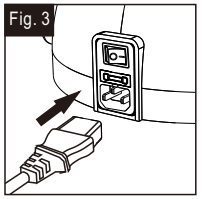
Fig. 2



5-3 Connecting the AC Electrical Cord

Correctly align then insert the AC Electrical Cord into the AC Electrical Cord Connection at the back of the Control Unit.(Fig. 3)

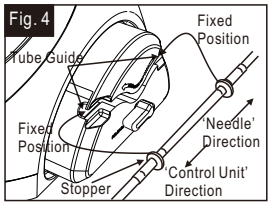
Fig. 3



5-4 Installing the Irrigation Tube

Please install the water supply pipe onto the side of the main unit. Then please send water supply pipe needle side of the clamp ring alignment host back in,it will be another clamp ring alignment water supply pipe guide of the load. (Fig. 4)

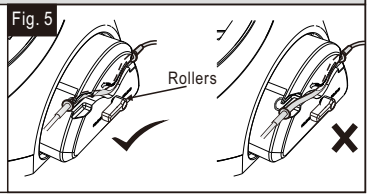
Fig. 4



⚠ CAUTION

Make sure that the tube is securely set on the rollers when closing the Pump Cover. If the tube is not correctly positioned on the Rollers and the cover is closed, the tube could be cut or sheared.(Fig. 5)

Fig. 5



After the tubes are correctly positioned, close the Pump Cover by turning the Pump Cover Lever to the 'CLOSE' position (180 degrees counter-clockwise).(Fig. 6&7)

Fig. 6

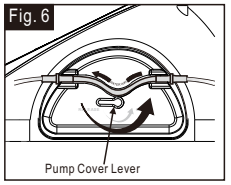
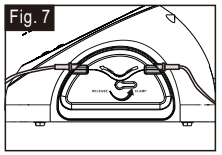


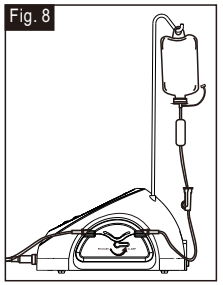
Fig. 7



5-5 Mounting the Coolant Solution Hanger Post

Mount the Coolant Solution Hanger Post onto the Holder on the Control Unit(the support bar maximum can hang 2 kg weight.), the post will only fit into one position.(Fig. 8)

Fig. 8



5-6 Insertion of the irrigation Tube

(1) Close the Tube Clamp, between the Irrigation Tube Needle and the Irrigation Pump.(Fig. 9)

(2) Insert the Irrigation Tube Needle into the Bottle Cap.(Fig. 10)

(3) Open the Tube Cap to supply air into the bottle.

(4) Open the Tube Clamp.

Fig. 9

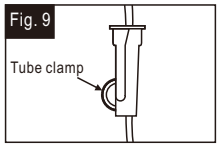
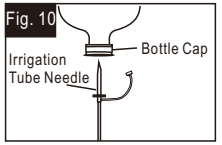


Fig. 10



⚠ CAUTION

Do not operate the Irrigation Pump if the tube is bent or the Tube Clamp is in the closed position. This could cause the tube to burst or slip out of the bottle.

5-7 Compatibility check of Internal Irrigation Nozzle/Drill

Internal irrigation nozzles accompanied with this product; is not necessarily fitted into all the drills on the market. Follow the instructions given below for confirmation prior to use.Failure to do so or to fit the internal irrigation nozzle into drills may cause a leakage of saline solution, which will result in problems such as rust or sudden stop of equipment during use.

Instructions:

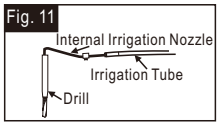
(1) Attach a bottle of saline solution to the Control Unit.

(2) Connect the Internal Irrigation Nozzle into the tip of the irrigation tube.

(3) Insert the Internal Irrigation Nozzle into the drill from the back.(Fig. 11)

(4) Purge at “Maximum” for 5 seconds.

Fig. 11



Points to be checked :

- ◇ Cleanliness of the saline solution coming out from the drill; if solution is colored there could be rust inside of the drill. If so renew the drill.
- ◇ Water Flow; if the flow is low and/or the flow from the drill is asymmetric, renew the drill.
- ◇ No water leakage between Internal Irrigation Nozzle and drill.

  Before use, ensure no water is leaking from the entry point of irrigation nozzle, a broken seal or no seal in the drill.may be the cause. Replace the drill even if its new, saline solution ingress into handpiece will cause malfunction.

⚠ CAUTION
If malfunction such as a leakage of saline solution from the back of Contra Head is detected during use, stop using and perform some troubleshooting.

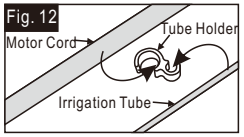
5-8 Irrigation Nozzle Attachment

C6-9/C6-19 has 1 irrigation method available depending on tool and application; External, Internal or both, For installation detail, refer to the handpiece Operation Manual.

5-9 Attaching the Tube Holder

Use the Motor Cord as a strain relief for the 'Irrigation Tube'. It is easier to insert Motor Cord first, then the Irrigation Tube.(Fig. 12)

Fig. 12



6. Operation

6-1 Programming the Micromotor Operation

The Control Unit can memorize 10 programs. Each program includes the following functions which will be automatically performed when the appropriate program number is selected.

- ◇ Gear ratio of contra angle handpieces
- ◇ Speed
- ◇ Direction of rotation
- ◇ Torque upper limit
- ◇ Coolant Solution Flow

Power Switch Symbol Mark	◯	|
FUNCTION	OFF	ON

(1) Turn on the power by pushing the Main Power Switch toward [|]; on power up program #1 is displayed by default.

(2) Select a program number by using either step (a) or step (b):

(a) Press the [Program] Key on the Control Panel until the desired program number is displayed.

(b) Press the [Program] button on the Foot Control until the desired program number is displayed.

(3) Selecting the Gear Ratio of the handpiece relevant to the program; Press the [Gear Ratio] Key to select the gear ratio of the handpiece(Gear Ratio will display on the LCD).

(4) Set the required max operating speed by pressing the [Speed] Key. Each time this Key is pressed display changes to the next speed level. By pressing this Key for more than 1 second brings the speed quickly to the next level until the speed display reaches its upper or lower limit.

- When the speed setting reaches the upper or the lower limit, an audible beep is heard and the speed setting cannot be changed any further.

(5) Set the torque upper limit by pressing the [Torque] Key on the Control Panel. Each time this Key is pressed display changes to the next torque level. By pressing this Key for more than 1 second brings the torque quickly to the next level until the torque display reaches its upper or lower limit.

- When the torque setting reaches the upper or the lower limit, an audible beep is heard and the torque setting cannot be changed any further.

(6) Set the rate of the Coolant Solution Flow volume by pressing the [Coolant Flow] Key. The rate of Coolant Solution Flow volume has 6 Flow rates (0-5) (0 = no coolant Flow).

(7) Memorize setting; after completing steps 2 - 6 press and hold [Memorize] key until beep is heard. The beep confirms that the programming is completed. If you hear a short beep when the [Memorize] Key is first pressed ignore this sound and keep the [Memorize] Key depressed until a long beep is heard.

* Repeat the above steps 2 - 7 to program any one of the 10 available programs.

6-2 Standard Operation

All standard operational functions can be control at the Foot Control.

(1) Turn on the Main Power Switch: The Control Unit is ready to perform the Program.

(2) Select the desired program number: Step on the Foot Control PRG (Program) Button and the program display ascends to the next program number. Pressing the PRG (Program) Button for one second more will descend the to the next program number.

(3) Verify the details of the program on the display.

(4) Operating the Micromotor : Step on the speed control pedal in the middle of the Foot Control the Micromotor will start to run. The Coolant Pump will also run (if programmed). Speed increases as the pedal is depressed. When the Speed Control Pedal is fully depressed the speed reaches the maximum preset value.

(5) Activation of the torque limiter: During use, when the drilling load reaches the preset torque upper limit, the integrated torque limiter automatically activates to prevent over torque. When the torque limiter activates, the motor stops after beeping for 1 second. To reactivate the Micromotor, release the speed control pedal and depress it again.

(6) Stopping the Micromotor: Release the Foot Control Pedal, and the Micromotor will automatically stop.

(7) Reversing the Micromotor rotational direction: To reverse direction of the Micromotor (and bur) simply step on the Foot Control Forward/Reverse button. A warning beep can be heard when the rotational direction is in reverse mode.

7. Cleaning, disinfection, packing and sterilization

7-1 Manual cleaning

- Use the softened water(< 38 °C) and brush to clean the 1# samples.

a. Surface cleaning

- Use the softened water(< 38 °C) and brush to clean the surface of motor and line until visually clean.

b. Crevices and cavities cleaning

- Use the softened water(< 38 °C) and brush to brush E type connector screw, the gap part, the connection gap of the motor rear part, pay particular attention to all crevices and cavities. Repeat several times until visually clean. Then Use the water absorbent cloth to remove any remnant of liquid.

7-2 Manual disinfection

Use KaVo Cavicide disinfectant liquid to disinfect the test samples.

7-3 Packing

Note:

▶The quality and use of the sterilisation packaging must comply with applicable standards and be suitable for the sterilisation procedure!

▶If potentially infectious liquids and particles can contact the products, it is recommended to cover and protect these areas with sterile disposable products.

Seal the handpiece tray and motor cable in a sterilisation pouch.

7-4 Sterilization

- Autoclave sterilization is recommended.
- Autoclave sterilization is required for the first time use and after each patient as noted below.
- Autoclave sterilizatio holding time15 minutes at 121 °C.
- Attach the Autoclave Plug to the Micromotor.(Fig. 13&14)
- Place those in autoclave pouch (not included in the package) and seal it.

The following items can be autoclaved.

- Implant Handpiece
- Micromotor with Motor Cord (Including the Motor Housing)
- Handpiece Stand
- Internal Irrigation Nozzle
- Tube Holder
- Nozzle Holder
- Autoclave Plug
- Calibration Bur

图13

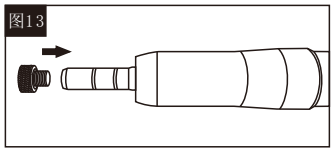
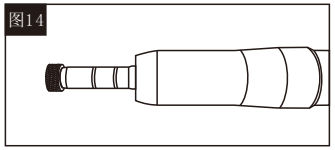


图14



8. Care and Maintenance

8-1 Protection Circuit

An electronic circuit breaker automatically functions to protect the Micromotor and the Control Unit if the Micromotor is ever overloaded. Power supply to the Micromotor will automatically be terminated an Error code will be displayed on the Control Unit.

◆Resetting the Protection Circuit

To reset the Protection Circuit, release and then depress the Speed Control Pedal.

8-2 Malfunction and Remedy

If the device is not working properly, please check the following table before calling our service center.

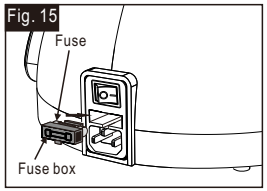
Malfunction	Cause of Malfunction	Remedy
System malfunction	• Memory components malfunction • Memory components damaged	Please contact with the seller
Over current	• Long time use under overload (over current) • Power cord short circuit • Motor coil short circuit	Probably the circuit is bad connected.Please connect the motor line properly. If still no improvement,please contact with the seller.
Over voltage	• Main power cord broken	
Motor sensor malfunction	• Motor sensor malfunction • Motor cord not been connected • Motor line (signal line) malfunction	
	• Water flow in to the motor	Please contact with the dealers.(in high pressure high temperature sterilization,please be sure to install the anti-steam dossil.
The main unit inside overheat	• Due to the long time use under overload, the temperature of the main unit arise. • To use the unit under the high temperature environment (direct sunlight)	Please wait until the temperature is cool down before using.Please place it in the environment that easy to cool down. If still no improvement, please contact with the seller.
Braking device malfunction	• Abnormal voltage appears the start and stop. • Start and stop circuit malfunction	In a short time repeated operation and stop, running, inhibit suddenly accelerated circuit may be start.Please wait for 1~2 seconds before operation. If still no improvement, please contact with the seller.
Motor running malfunction	• Malfunction of the handpiece • Malfunction of the motor	Probably the chuck is opened or not fully closed. If still no improvement, please contact with the seller.
	• When the Torque reaches its limit, the stop process lasts formore than 5 second.	Not malfunction. It is for the safety. It can still be used after connect.
Water supply pump overvoltage	• Water supply pipe not been fully attached to the right place of the water supply pump	Please confirm the state of water supply pipe. If it is normal, but still appear the malfunction signal. please contact with the seller.
Water supply pump over current	• Water supply pump malfunction	please contact with the seller.
Foot control abnormal	• Bad connection	Please confirm connection status
	• Foot control inside malfunction	If the foot control is in normal, but still show the malfunction number, please contact with the seller.

8-3 Fuse Replacement

If the Control Unit does not function, check the fuses (Fuse Box lock located on the rear of the Control Unit). To access the Fuse, use a pointed tool push on the fuse locking latch and the drawer will spring open.(Fig. 15)
Internal fuse replacement:Tear down the host at the bottom of the screw with a screwdriver tool to take out the safety device can replace the internal fuse.

Fuse Ratings	
120V	F3AL 250V
230V	F2AL 250V

Fig. 15



8-4 Maintenance of the Control Unit and Foot Control

If blood or saline solution has stained the Control Unit or Foot Control, remove the AC Electrical Cord; wipe Control Unit or Foot Control with a damp cloth, then with an alcohol-absorbed cloth.

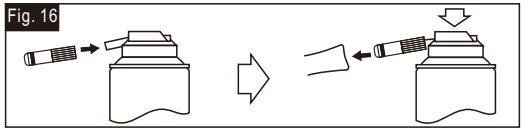
8-5 Maintenance of the Handpiece Attachment

Every time after treatment, please put the head of the handpiece into the clean water and rotate for 4-5 seconds, to clean the blood and physiological saline. If the attachments on the handpiece is too much, use the dry and soft rag to wipe them out. Please do not put the whole handpiece into the water, in case of the water flow into the handpiece from behind.

[after use, do not forget the lubrication before sterilizing under the high temperature and high pressure.]

As shown in Fig. 16, put the nozzle into the handpiece behind, spray for more than 2 seconds.

Fig. 16



⚠ NOTICE

When lubricating, please hold the hadnpiece tight, in case of the handpiece fly off due to the force of the spray air.
In order to make the oil and gas completely mix, please shake the tank for some time.
When lubricating, please be sure to clean up the lubrication oil tank.

If the head of the handpiece attach too much blood and dirt, need to be separately cleaned and refueled. Install the clean nozzle to it, and wash directly from inside(Fig. 17).
If the water supply nozzle is stuck, please use the needle to clean it(Fig. 18).
If there is dirt around the nozzle, please use brush to clean it(Fig. 19).

Fig. 17

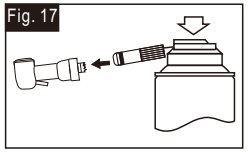


Fig. 18

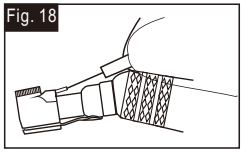
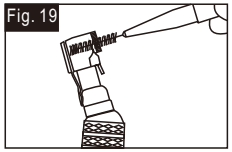


Fig. 19



9. Specifications

9-1 Control Unit

Model	C-Sailor
Power Supply Voltage	AC230V
Frequency	50Hz
Power Consumption	120VA
Max. Pump Output	100mL / min
Dimensions	W285 x D265 x H155mm

9-2 Micromotor

Speed Range	300-50,000r/min
Input Voltage	DC30V
Dimensions	Ø27 x L123mm

9-3 Foot Control

Code length	1.77m

9-4 Handpiece(Purchased separately)

Model	C6-9	C6-19
Max. Rotation Speed	2,500r/min	
Gear Ratio	20:1 Reduction	
Spray Type	External, Internal*	

Fit ISO 3964 20:1 and IEC 80601-2-60 Standard requirement Implant contra angle

Torque: more than 55 N.cm

Do not exceed the rotation speed that bur manufacture recommends. Adjust the rotation speed which bur manufacture recommend, if you use the allowable rotation speed is less than 120,000rmin-1.

* If you use internal irrigation system drills.

9-5 Infusion Tube

User can purchase separately from hospitals ,pharmacies and W&H Dentalwerk Bürmoos GmbH company. (REF 04363600) .

9-6 The Cooling Liquid

Physiological saline(Internal and external cooling) (concentration:0.9%; flow velocity:0~100 ML/min)

10. Warranty

The warranty of main unit and foot pedals are 12 months,motor is 6 months, other accessories are not included in the warranty.

If necessary, we can provide circuit diagram, components list,describes, calibration instructions and so on.

11. Disposing Product

Consult with dealer from whom you purchased it about waste disposal.

12. Symbols

CE 0197 — The EU directive 93/42/EEC was applied in the design and production of this medical device.

IPX7 — Protected against the effects of 30 minutes' immersion in water.

Dispose of this device and its accessories via methods approved for electronic device and in compliance with the Directive 2002/96/CE.


Type B applied part


See Operation Manual


This way up


Used indoor only


Fragile,handle with care


Keep away from rain


Foot pedal connector


Warning

ON(power connection)


OFF(power disconnection)


Alternating Current


Electric fuse

European Union agent


CE mark


Date of manufacture


Manufacturers