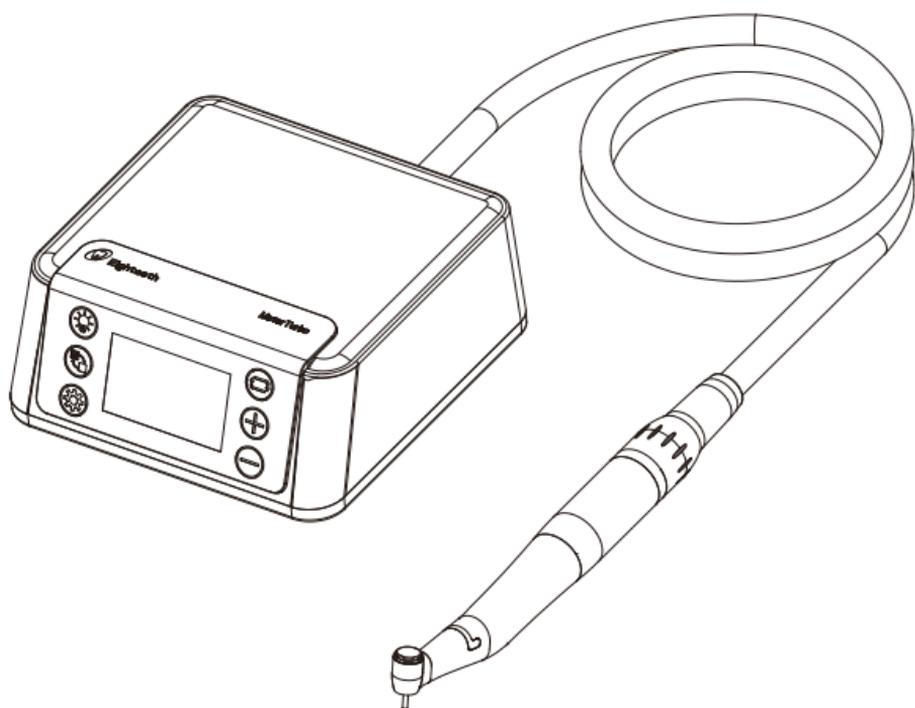


MotorTurbo



Dental Low-voltage Electrical Motor USER MANUAL

Changzhou Sifary Medical Technology Co., Ltd.

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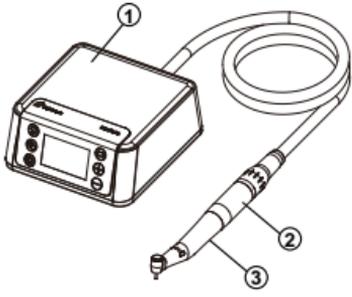
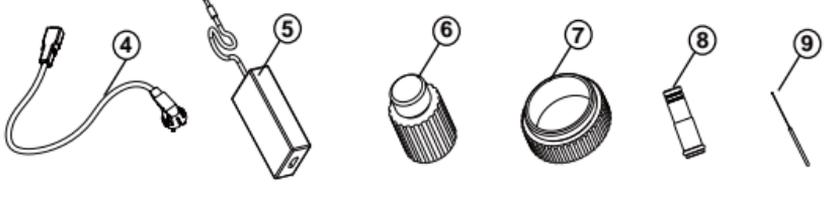
Size:87mm X 180mm

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1.Scope of MotorTurbo

1.1 Parts identification

	<ul style="list-style-type: none"> ① Host ② Motor ③ Dental Contra-angle Handpiece ④ Power cable ⑤ Power adapter ⑥ Motor disinfection front plug ⑦ Motor disinfection back plug ⑧ Spray nozzle ⑨ Needle
	

1.2 Components

<p>Host (1pc)</p>  <p>6451034</p>	<p>Motor (1pc)</p>  <p>6413002</p>	<p>Power Adapter (1pc)</p>  <p>6416002</p>
<p>Power cable (1pc)</p>  <p>6415012</p>	<p>O-ring (3pcs)</p>  <p>6422007</p>	<p>Dental Contra-angle Handpiece (1pc)</p>  <p>6436001</p>

1.3 Accessories

<p>Motor disinfection front plug (1pc)</p>  <p>6401132</p>	<p>Motor disinfection back plug (1pc)</p>  <p>6401133</p>	<p>Spray Nozzle (1pc)</p>  <p>6451044</p>
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Needle (1pc)  6441024		
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1.4 Essential performance

MotorTurbo has no essential performance.

2. Symbols used

	General warning sign
	Caution
	Serial number
	Catalogue number
	Manufacturer
	Country of manufacture
	Batch code
	Authorized representative in the European Community
	Medical device
	CE marking
	Type B applied part
	Direct current
	Dispose of in accordance with the WEEE directive
	Keep dry
	Sterilizable in a steam sterilizer (autoclave) at the temperature specified
	Washer-disinfector for thermal disinfection
	Temperature limitation
	Relative humidity limitation
	Atmospheric pressure limitation
	Manufacturer's LOGO
	Consult instructions for use

3. Before use

3.1 Intended purpose

The MotorTurbo Dental Low-voltage Electrical Motor is used to provide driving force for dental handpieces in general dental surgery.

This device must only be used in hospital environments, clinics or dental offices by qualified dental personnel and not used in the oxygen-rich environment.

3.2 Contraindications

The MotorTurbo is contraindicated in cases where patient/user carry medical implants such as pace makers or cochlear implants etc.

Do not use the device for implants or other non-endodontic dental procedures.

Safety and effectiveness have not been established in pregnant women and children.



Read the following warnings before use:

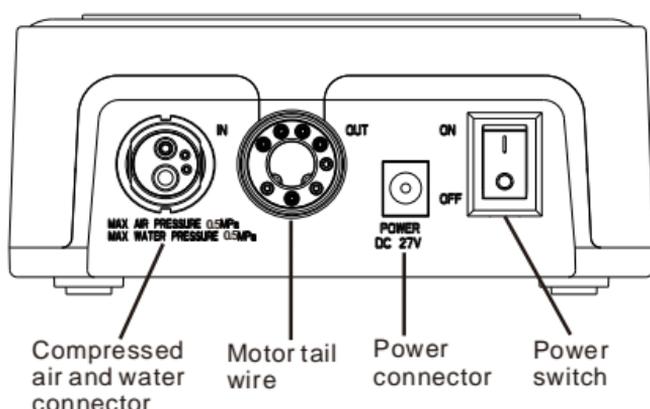
- The device must not be placed in humid surroundings or anywhere where it can come into contact with any type of liquids.
- Do not expose the device to direct or indirect heat sources. The device must be operated and stored in a safe environment.
- Do not use the equipment in the presence of free oxygen, anesthetic gas or combustible materials. The equipment must be operated, used and stored in a safe environment.
- The device requires special precautions with regard to electromagnetic compatibility (EMC) and must be installed and operated in strict compliance with the EMC information. In particular, do not use the device in the vicinity of fluorescent lamps, radio transmitters, remote controls and do not use this system near the active Surgical Equipment and the RF shielded room of an ME SYSTEM for magnetic resonance imaging, where the intensity of EM DISTURBANCES is high. Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the MotorTurbo, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
- Please do not use or store this equipment at high temperature. Please pay attention to the use and storage conditions.
- Never open or repair the device yourself, otherwise, void the warranty.
- If irregularities occur in the device during treatment, switch it off. Contact the agency.

- Please use the original power adapter.
- Connect to the power supply network with protective grounding.
- Do not dismount the motor or contra angle during operation, otherwise the contra angle and motor will be damaged.
- Turn off the power switch after each use.
- Heavy hit, such as falling, will cause damage to the dental low-voltage electric motor.
- Do not use accessories from other companies, otherwise the product may be damaged. Our company will not be responsible for any problems with the use of accessories not of our company.
- Please pre-operate the product outside the patient's mouth before use. Should any abnormal situation occurs, such as looseness, vibration, noise or heating, please stop using the handpiece immediately and contact your authorized dealer.
- The product should be maintained by the professional and cannot be repaired on site.
- The product should be stored in a dry, clean environment away from harmful chemicals and gases such as acids and alkalis. Avoid pressure, collisions, rain and snow during transportation.
- Entry of debris into the chunk, via the bur shank, could cause bur rotation slip and also prevent the bur from being securely located in the chunk.
- Make sure that the handpiece completely stops when inserting or removing the bur. Depressing the Push button while the handpiece is in operation may cause overheating, serious technical damage and possible premature handpiece failure. During operation, avoid any actions that may cause the Push button to be depressed while the handpiece is in operation.
- Make sure the bur is firmly loaded before use.
- Make sure the spray water and gas (cooling gas) of the handpiece are normal. Or the handpiece head surface temperature will exceed 41°C. Insufficient spray water and gas can cause the medical device to overheat and damage the handpiece.
- If the temperature of handpiece rises obviously, please stop using.
- If the handpiece is damaged or seriously abraded, it will cause cutting efficiency, abnormal rotation, excessive vibration, irregular running noise and overheating. The operator should perform regular function and maintenance check, and replace the handpiece according to clinical use.
- Press the Push button to release the internal chunk while removing the bur. Don't remove the bur by force if the internal chunk is not fully released, otherwise, it will damage the handpiece.
- The clamping shaft length should not be too short, otherwise it will cause uneven bearing load and accelerate bearing abrasion.

- Do not use non Sifary accessories to avoid damage to the handpiece or other hazards.
- Please wear gloves during operation

4. Assemble and disassemble the MotorTurbo

4.1 Host connection



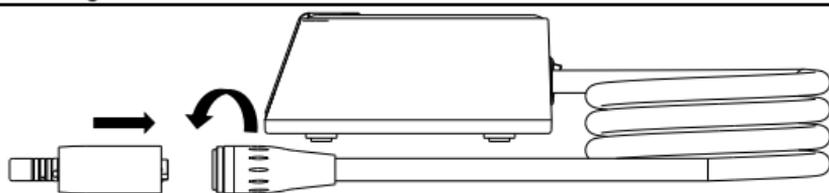
Open the package, please make sure the product contains all accessories listed on the packing list, and place the host on a stable surface.

Connect the compressed air and water connector to the handpiece four-hole connector (in accordance with ISO 9168) of the dental treatment unit, and tighten the nut.

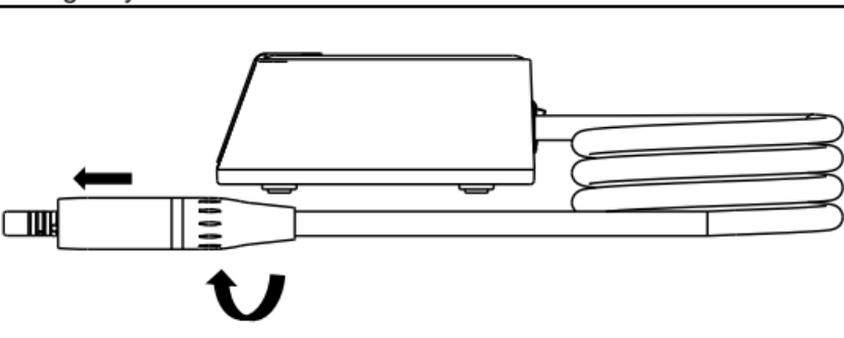
Connect the power adapter to the power connector, and connect the power cable to power adapter, then connect the power cable plug into a power source that meets the requirements (refer to 11. Technical data).

4.2 Motor connection and disconnection

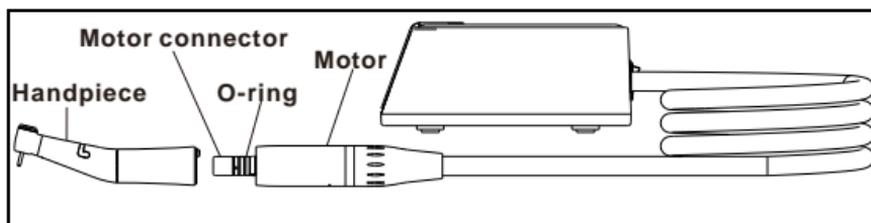
Motor connection: align the motor tail wire nut with the motor, and then tighten the motor tail wire nut.



Motor disconnection: Unscrew and separate the motor tail line nut, and gently disassemble the motor.



4.3 Handpiece connection and disconnection



Align the dental handpiece positioning block and the motor groove, insert the motor connector directly into the handpiece, and when you hear a "click" sound, the connection is completed.

When disconnect the handpiece, parallel pull the dental handpiece from the motor.

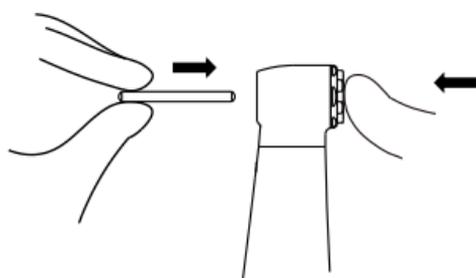


- Before inserting the handpiece, make sure that the O-ring on the motor connector is lubricated. If it's not lubricated, spray slight amount of dental handpiece lubricant to ensure that the O-ring is lubricated.
- If the O-ring is severely worn or damaged, please replace it with a new one to prevent water and air leakage.
- When assemble the O-ring, first assemble the outer O-ring, and then assemble the inner O-ring in sequence.
- After connecting the handpiece to the motor, gently pull the handpiece to ensure that it is firmly connected.
- Do not use the device on patients who are allergic to Nickel.

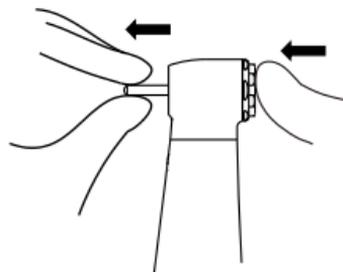
4.4 Insertion and removal of the bur

Insertion: Insert the bur until it is correctly seated in place. Depress the Push button and insert the bur into the chunk until the bur "notch" mechanism engages. Release the button. Make sure the bur is secure by gently pulling and pushing the bur without depressing the Push button.

Refer to the figure below:



Removal: Depress the Push button and remove the bur after the internal chunk is fully released. Refer to the figure below.



5. Use interface

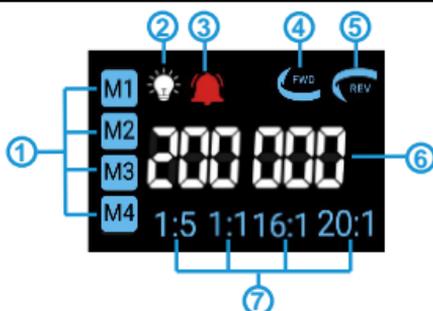
5.1 Host operation panel



There are 6 touch buttons on the host operation panel , their functions and uses are as follows:

- ① **LED button:** Short press to switch the motor LED luminance.
- ② **Working mode button:** Short press to switch working mode (M1-M4).
- ③ **Handpiece transmission ratio button:** Long press for 2 to 3 seconds to set the handpiece transmission ratio in each working mode.
- ④ **Rotation direction button:** Short press to switch the motor rotation direction: clockwise/counterclockwise (a continuous and slow "Beep, Beep" sound will appear when the motor rotates counterclockwise)
- ⑤ **Speed increase button:** Increase the motor output speed: single short press for a single increase, or long press for rapid increase.
- ⑥ **Speed decrease button:** Decrease the motor output speed: single short press for a single decrease, or long press for rapid decrease.

5.2 Screen display



The picture shows the host screen display interface, the meaning

of each symbol is as follows:

- ① **Working mode:** There are four working modes for users to choose (M1, M2, M3, and M4). Users can set four general working modes according to their habits. The speed, handpiece transmission ratio, rotation direction and LED status of each working mode can be set independently, and the working mode can be automatically saved after each setting. It will enter the working mode of the last shutdown when it is turned on again.
- ② **LED status:** There are three statuses: off, semi-light, and high-light. The status of the LED light will be displayed as high-light by default each time it is turned on.
- ③ **Fault light:** When the fault light is on, it indicates that the device is malfunctioning. When this happens, check the status of the device. The fault light is off under normal conditions.
- ④ **FWD:** The motor is rotating clockwise in the current working mode.
- ⑤ **REV:** The motor is rotating counterclockwise in the current working mode.
- ⑥ **Dental handpiece output speed(RPM):** Indicates the current output speed of the dental handpiece. The range of rotation speed differs for dental handpiece with different transmission ratios.
- ⑦ **Handpiece transmission ratio:** Indicates the gear transmission ratio of the current dental handpiece. There are four kinds of transmission ratios (1:5, 1:1, 16:1, 20:1), please select the corresponding parameters according to the handpiece transmission ratio (make sure that the handpiece transmission ratio is consistent with the set handpiece transmission ratio), otherwise, the dental handpiece may be damaged.

5.3 Terms and definition

FWD	Forward (Clockwise rotation)
REV	Reverse (Counterclockwise rotation)
RPM	Revolutions Per minute
Working mode	Such as M1-M4
Handpiece transmission ratio	The gear transmission ratio of the handpiece, such as: 1:5 for increasing

	speed, 1:1 for constant speed, 16:1 for deceleration, and 20:1 for deceleration.
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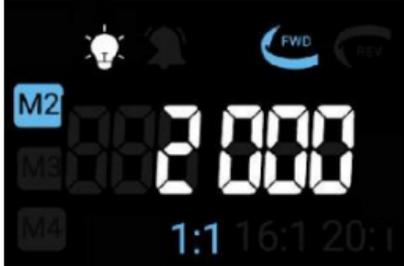
6. Setting

6.1 Set mode parameter

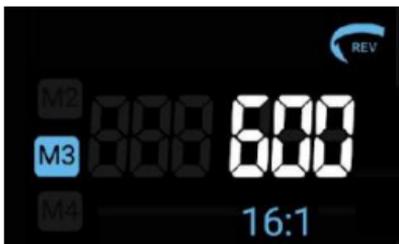
M1 mode parameter setting (connected to a handpiece with a transmission ratio of 1:5)

	Set the working mode to M1	
	Set the transmission ratio to 1:5	
	Set rotation direction to FWD	
	Set LED light status to high-light	
	Set rotation speed to 200000RPM (Rotation range is 10000RPM - 200000RPM , and step value is 5000RPM)	 

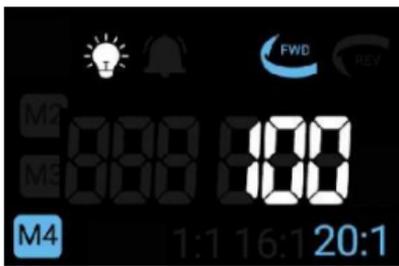
M2 mode parameter setting (connected to a handpiece with a transmission ratio of 1:1)

	Set the working mode to M2	
	Set the transmission ratio to 1:1	
	Set rotation direction to FWD	
	Set LED light status to high-light	
	Set rotation speed to 2000RPM (Rotation range is 2000RPM - 40000RPM, and step value is 1000RPM)	 

M3 mode parameter setting (connected to a handpiece with a transmission ratio of 16:1)

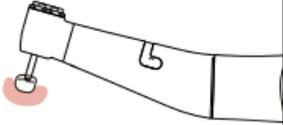
	Set the working mode to M3	
	Set the transmission ratio to 16:1	
	Set rotation direction to REV	
	Set LED light status to OFF	
	Set rotation 600RPM (Rotation range is 100RPM - 2500RPM, and step value is 100RPM)	 

M4 mode parameter setting (connected to a handpiece with a transmission ratio of 20:1)

	Set the working mode to M4	
	Set the transmission ratio to 20:1	
	Set rotation direction to FWD	
	Set LED light status to high-light	
	Set rotation to 100RPM (Rotation range is 100RPM - 2000RPM, and step value is 100RPM)	 

Note: The above setting is only an example of parameter setting of each working mode. Users can set the transmission ratio, rotation direction, LED status, speed under each working mode according to their own needs. The steps are the same as above.

7.Operation



1. Install the product correctly according to the product installation steps;
2. Turn on the power switch on the back of the host and enter the standby state;
3. Set the spray air and cooling air input pressure, and the recommended pressure is 0.25-0.3MPa.
4. Set the spray water input pressure, and the recommended pressure is 0.15-0.25MPa.
5. Under the standby state, select a working mode and set the parameters, start the dental low-voltage electric motor by stepping on the foot switch of the dental treatment unit.



- Before using the device for the first time, make sure that foot switch of dental treatment unit is calibrated.
- Before using it for treatment, please try it outside the oral cavity to make sure that there is no malfunction of the device.
- Before starting the equipment, please confirm that the transmission ratio of the handpiece is the same as the transmission ratio of the selected working mode, otherwise the handpiece may be damaged.
- Check the handpiece to make sure it sprays normally. If the spray is abnormal, stop using it.
- Before starting the device, check whether the motor tail wire is flatten, make sure the water and air tube is not blocked.
- Before using the device for a treatment, please be sure that the cooling air is normal, or the motor surface temperature will exceed 41°C, which may cause the reduction of motor efficiency, or even hurt the operator.
- If the handpiece or motor temperature rises obviously, please stop using and contact your distributor.
- Do not press the button of the back cover of the handpiece during treatment, otherwise the equipment will be damaged, and even cause bur flying, which may hurt the patient.



- When the operation completed, please release the foot switch of dental treatment unit first; then cut off the power; next disassemble the handpiece and motor; finally remove the power adapter and the handpiece four-hole connector of the dental treatment unit from the host.

8.Cleaning, disinfection and sterilization

8.1 Foreword

For hygiene and sanitary safety purpose, the components (Motor, Motor disinfection front plug and Motor disinfection back plug) must be cleaned, disinfected and sterilized before each usage to prevent any contamination. This concerns the first use as well as the subsequent uses. Comply with your national guidelines, standards and requirements for cleaning, disinfection and sterilization.

Reprocessing procedures have only limited implications to this dental device. The limitation of the numbers of reprocessing procedures is therefore determined by the function / wear of the device. From the processing side there is no maximum number of allowable reprocessing. The Motor, Motor disinfection front plug, Motor disinfection back plug and Dental Contra-angle Handpiece are verified to be able to withstand 250 times 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.

8.2 General recommendations

- The user is responsible for the sterility of the product before the first use and each further usage as well as for the usage of damaged or dirty instruments, where applicable after sterility.
- Clean the products within two hours after each use.
- For your own safety, please wear personal protective equipment (gloves, safety glasses, etc.).
- The water quality must meet the requirements of EN 13060.
- Thoroughly clean and wash the components before autoclaving.
- Do not lubricate the motor.
- Do not use bleach or chloride disinfectant materials.

8.3 Autoclavable components

Autoclavable Components		
Motor 	Motor disinfection front plug 	Motor disinfection back plug 

Dental Contra-angle Handpiece



- Only the components above can be autoclaved.
- Before first use and after each use, sterilize the above components.

Reprocessing instructions

Preparation at the point of use: Disconnect the motor from the host. Refer to "Chapter 4.2 - Motor connection and disconnection" of this manual for disassembly instructions. Remove gross contaminations from the motor surface and Dental Contra-angle Handpiece with a cloth, which dipped in cold water (0-40°C) immediately after use. Don't use a fixating detergent or hot water (40-100°C) as this can cause the fixation of residuals which may influence the result of the reprocessing process.



- Do not submerge the motor and Dental Contra-angle Handpiece or wipe it with any of the following functional water (acidic electrolyzed water, strong alkaline solution, or ozone water), medical agents (glutaral, etc.), or any other special types of water or commercial cleaning liquids. Such liquids may result in metal corrosion and adhesion of the residual medical agents to the components.
- Do not rinse the motor with water, to prevent water from entering the motor.

Transportation:

Safe storage and transportation to the reprocessing area to avoid any damage and contaminate on to the environment.

Pre-Cleaning:

Wipe the motor surface with cloth dipped in clean water.

Do a manual pre-cleaning, until the components are visually clean.

Do a manual pre-cleaning, until the handpiece is visually clean.

Clean the surfaces with a soft bristle brush. And clean the chuck with a fine soft bristle brush.

Cleaning for motor and :

To prevent water from entering the motor, manual cleaning is recommended. If the water enters the motor, it may cause abnormal noise or vibration, will reduce lifetime of the motor.

Wipe the motor surface more than 5 times, with a soft cloth which is dipped in clean water.

Then wipe the motor surface more than 5 times, with a soft cloth which is dipped in Ethanol (70-80 vol% Ethanol) .at least 2 minutes each time.



- Do not rinse the motor with water, to prevent water from entering the motor.
- Do not submerge motor with any liquid.

Cleaning for Dental Contra-angle Handpiece:

Regarding cleaning/disinfection, rinsing and drying, it is to distinguish between manual and automated reprocessing methods. Preference is to be given to automated reprocessing methods, especially due to the better standardizing potential and industrial safety.

Automated cleaning:

Carefully put the components into the washer-disinfector on a tray and set the parameters as follows, then start the program:

4 min pre-washing with cold water (0-40°C);

emptying

5 min washing with a mild alkaline cleaner (pH value between 7.5 and 8.5) at 55°C±2°C;

emptying

3 min neutralising with warm water (40-60°C);

emptying

5 min intermediate rinsing with warm water (40-60°C);

Emptying

The automated cleaning processes have been validated by using 0.5% neodisher MediClean forte (Dr. Weigert).

Note: The automated cleaning processes have been validated by using 0.5% neodisher MediClean forte (Dr. Weigert) and Rapid-A520 Washer-disinfector from Shandong Xinhua Medical Device Co., Ltd.



- Use only approved wash-disinfectors according to EN ISO 15883, maintain and calibrate it regularly.
- Follow instructions and observe concentrations given by the manufacturer (refer to general recommendations).

Avoid any contact between the Dental Contra-angle Handpiece and any instrument, kit, support or container.

Disinfection for motor:

Wipe the surface of the motor (including the motor disinfection front and back plug) for 3 times, with a soft cloth which is dipped in Ethanol (70-80 vol% Ethanol), at least 2 minutes each time.

Automated disinfection for Dental Contra-angle Handpiece:

Automated Thermal Disinfection in washer/disinfector under consideration of national requirements with regard to A0 value (refer to EN ISO 15883).

A disinfection cycle of 5mins disinfection at $93\pm 2^{\circ}\text{C}$ has been validated for the device to achieve an A0 value of 3000. After manual cleaning, the instruments should be automated disinfected or sterilized immediately. A manual disinfection is not recommended.

Drying for motor:

Manual Drying:

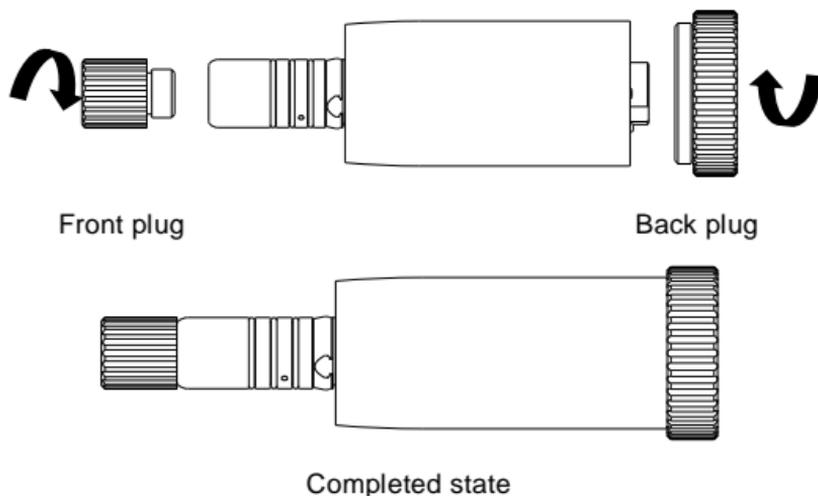
Manual drying can be performed through lint free towel. Insufflate cavities of instruments by using sterile compressed air.

Automated drying for Dental Contra-angle Handpiece:

Drying of outside of instrument through drying cycle of washer/disinfector. If needed, additional manual drying can be performed through lint free towel. Insufflate cavities of instruments by using sterile compressed air.

Disinfection plug installation:

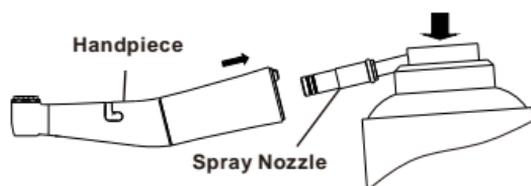
To prevent the steam from entering the motor, please screw the Motor disinfection front and Motor disinfection back plug to both ends of the Motor before sterilization. Refer to the figures below:



- Be sure to screw the plugs to the Motor before sterilization, or it will reduce the life of motor.

Lubricating for Dental Contra-angle Handpiece:

Insert the spray nozzle in rear of the handpiece, and apply the handpiece professional lubricant for lubricating and maintenance. Press the lubricant button (for 2-3 seconds) until the lubricant expels from the handpiece head. Press repeatedly until no black lubricant expels from the handpiece head. Refer to the figure below:



- Before packaging and autoclaving, the handpiece must be lubricated according to manufacturer's instruction.
- Do not lubricate the motor

Packaging:

The devices that require sterilization can be packaged together in one pouch, but it is necessary to ensure that the packaging pouch is large enough and will not be damaged due to excessive volume.



- Check the validity period of pouch given by the manufacturer to determine the shelf life.
- Use pouches which resist to a temperature up to 141°C and in accordance with EN ISO 11607.
- Do not lubricate the motor.
- Make sure that the disinfection plugs are screwed before packaging.

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.

Minimum requirements: 5 min at 134±2°C

Drying time: at least 8min

Flash sterilization is not allowed on lumen instruments!



- Use only approved autoclave devices according to EN 13060 or EN 285.
- Use a validated sterilization procedure according to EN 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, physicochemical integrators, digital records of cycles parameters).
- Wait for cooling before touching.

Storage:

Store the sterilized instruments in a dry, clean and dust free environment at modest temperatures, refer to label and User Manual.

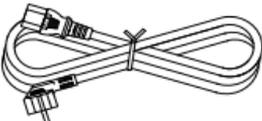
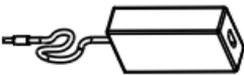


- Sterility cannot be guaranteed if packaging is open, damaged or wet.
- Check the packaging and the Motor before use (packaging integrity, no humidity and validity period).



The instructions provided above have been validated by the manufacturer of the medical device as being capable of preparing a medical device for use. It remains the responsibility of the processor to ensure that the processing, as actually performed using equipment, materials and personnel in the processing facility, achieves the desired result. This requires verification and/or validation and routine monitoring of the process. Likewise, any deviation by the processor from the instructions provided should be properly evaluated for effectiveness and potential adverse consequences.

8.4 Disinfection components

Disinfection components		
<p>Host</p> 	<p>Power cable</p> 	<p>Adapter</p> 
<p>Wipe all the surfaces with a cloth lightly moistened with Ethanol for Disinfection (Ethanol 70 to 80 vol%) at least 2min, repeat for 5 times.</p>		
<p></p> <ul style="list-style-type: none">● Do not use disinfectants other than ethanol for disinfection (Ethanol 70 to 80 vol%).● Do not use excessive ethanol to prevent ethanol from seeping into the parts and damaging the internal parts.● Disinfect before and after each use.		

9. Error warnings

	<p>When the input air source pressure is more than 0.6MPa, the fault light will be on. At this time, the host will not work while operating the control foot switch. Adjust the input pressure to the range of 0.25-0.5MPa. If the fault light is still on, please contact your local dealer.</p>
	<p>When the motor drive fails, the fault light will be on, please contact your local dealer for repairing, do not disassemble the machine to repair it yourself.</p>

10.Troubleshooting

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
Cannot power on	Wrong power adapter is used	Please use the original power adapter
	The power adapter is not plugged into the socket	Please check the connection
	The socket is not energized	Please check the connection
The motor does not rotate	The compressed air pressure is too low or the air source is not open	Check whether the air source is open and adjust the air pressure between 0.25MPa -0.5MPa
	Handpiece stuck	Pull out the handpiece and check whether the motor rotates. If it can rotate normally, please clean or repair the handpiece
	Problem on the control foot switch of dental treatment unit	Check whether the control foot switch can control the water and air source of the dental treatment unit
The bur cannot be clamped or the bur cannot be inserted	The bur does not meet the standard	Apply the bur that meets the standard
	Rust or residual stains on the chuck	Lubricate and clean the inner hole

Poor spray or spray on the machine head	The three-hole nozzle of the handpiece is blocked by impurities	Clean and dredge the three-hole nozzle with a needle
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- Unauthorized modification of the MotorTurbo may cause hazards:
- The motor can't reverse.
- Water or air leakage from motor.
- The host can't control the motor.
- Circuit board damage

11. Technical data

Manufacturer	Changzhou Sifary Medical Technology Co., Ltd.
Model	MotorTurbo
Power adapter input	AC 100 ~ 240V, 50/60Hz, ± 1 Hz 1.5A
Power adapter output	27V $\overline{\text{---}}$ 2.5A
Power adapter fuse	 T3.15AL 250V
Main unit input	27V $\overline{\text{---}}$ 2.5A
Cooling air (Q)	5NL/min \leq Q \leq 40NL/min (0.25MPa-0.5MPa)
Motor Spray air supply	\geq 1.5NL/min (0.25MPa)
Motor Spray water flow	\geq 50mL/min (0.25MPa)
Air pressure range	0.25MPa-0.5MPa
Water pressure range	0.15MPa-0.5MPa
Handpiece spray water flow	\geq 50mL/min (200kPa)
Handpiece spray air flow	\geq 1.5NL/min (200kPa)
Speed range	2000-40000RPM, $\pm 10\%$
Torque	>1 N·cm
Handpiece connector type	Comply with ISO 3964:2016 Dentistry-Coupling dimensions for handpiece connectors
Shank type and size	Comply with ISO 1797:2017 requirements for type 3 shank, diameter $\phi 1.6_{-0.01}^0$ mm
Chuck type	Push-button chuck
Gear ratio	1:5
Light	White LED
Type of protection against electrical shock	Class I
MDR: Annex VIII	Class IIa
Applied part (Motor)	B
Operation mode	Intermittent operation, ON 1 minute / OFF 5 minutes
Ingress Protection	IPX0

Operation conditions	Use: in enclosed spaces Ambient temperature: 5°C ~ 40 °C Relative humidity: <80% Operating altitude < 3000m above sea level
Transport and storage conditions	Ambient temperature: -20 °C ~ +55 °C Relative humidity: 20% ~ 80 % Atmospheric pressure: 70kPa ~ 106kPa

12. EMC tables

Guidance and manufacturer's declaration - electromagnetic emissions		
The MotorTurbo is intended for use in the electromagnetic environment specified below. The customer or the user of the MotorTurbo should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment guidance
RF emissions CISPR 11	Group 1	The MotorTurbo 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 CISPR 11	Class B	The MotorTurbo is suitable for use 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 IEC61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
The MotorTurbo is intended for use in the electromagnetic environment specified below. The customer or the user of the MotorTurbo 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, +/- 8 kV, +/- 15 kV air	+/- 8 kV contact +/- 2 kV, +/- 4 kV, +/- 8 kV, +/- 15 kV 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 transients/bursts IEC 61000-4-4	± 2 kV 100kHz repetition frequency	± 2 kV 100kHz repetition frequency	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	Line to line: ± 0.5 kV, ± 1 kV	Line to line: ± 0.5 kV, ± 1 kV	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips IEC 61000-4-11	0% UT; 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0% UT; 1 cycle and 70% UT; 25/30 cycles sine phase at 0°	0% UT; 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0% UT; 1 cycle and 70% UT; 25/30 cycles sine phase at 0°	Mains power quality should be that of a typical commercial or hospital environment. If the user of devices require continued operation during power mains interruptions, it is recommended that devices be powered from an uninterruptible power supply or a battery
Voltage interruptions IEC 61000-4-11	0% UT; 250/300 cycle	0% UT; 250/300 cycle	

Rated Power frequency magnetic field IEC 61000-4-8	30 A/m 50Hz or 60Hz	30 A/m 50Hz or 60Hz	Power frequency magnetic field should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: UT: rated voltage(s); E.g. 25/30 cycles means 25 cycles at 50Hz or 30 cycles at 60Hz			

Guidance and manufacturer's declaration – electromagnetic immunity

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

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted disturbances induced by RF fields IEC 61000-4-6	3 V 0.15 MHz – 80 MHz, 6 V in ISM bands between 0.15 MHz and 80 MHz, 80 % AM at 1 kHz	3 V 0.15 MHz – 80 MHz, 6 V in ISM bands between 0.15 MHz and 80 MHz, 80 % AM at 1 kHz	Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the MotorTurbo, including cables specified by the manufacturer.
Radiated RF EM fields IEC 61000-4-3	3 V/m, 80 MHz – 2,7 GHz, 80 % AM at 1 kHz	3 V/m, 80 MHz – 2,7 GHz, 80 % AM at 1 kHz	

Proximity fields from RF wireless communications equipment

Nowadays, many RF wireless equipment have being used in various healthcare locations where medical equipment and/or

systems are used. When they are used in close proximity to medical equipment and/or systems, the medical equipment and/or systems' basic safety and essential performance may be affected. The **MotorTurbo** has been tested with the immunity test level in the below table and meet the related requirements of IEC 60601-1-2:2020. The customer and/or user should help keep a minimum distance 30cm between RF wireless communications equipment and the **MotorTurbo**.

Test frequency (MHz)	Band (MHz)	Service	Immunity test level (V/m)
			Professional healthcare facility environment
385	380-390	TETRA 400	Pulse modulation 18Hz, 27V/m
450	430-470	GMRS 460 FRS 460	FM, ± 5 kHz deviation, 1kHz sine, 28V/m
710	704-787	LTE Band 13, 17	Pulse modulation 217Hz, 9V/m
745			
780			
810	800-960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18Hz, 28V/m
870			
930			
1720	1700 - 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation 217Hz, 28V/m
1845			
1970			
2450	2400 - 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217Hz, 28V/m
5240		WLAN 802.11 a/n	Pulse modulation 217Hz, 9V/m
5500			

5785	5100 - 5800		
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Guidance and manufacturer's declaration –Proximity magnetic fields

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

Proximity magnetic fields	IEC 61000-4-39 test level	Compliance levels	Electromagnetic environment-guidance
Proximity magnetic fields	134.2kHz Pulse modulation 2.1 kHz	65A/m	Power frequency magnetic field should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Proximity magnetic fields	13.56MHz Pulse modulation 50 kHz	7.5A/m	

Cable information:

Cable Name	Cable Length (m)	Shielded or Not	Remark
Adapter output Cable	1	Not	/
Power cable	1.8	Not	/
Motor tail cable	2	Not	/



- Use of accessories and cables other than those specified or provided by the manufacturer of **MotorTurbo** could result in increased electromagnetic emissions or decreased electromagnetic immunity of **MotorTurbo** and result in improper operation.
- Use of **MotorTurbo** adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, **MotorTurbo** and the other equipment should be observed to verify that they are operating normally.

13.Warranty

1. **MotorTurbo** is warranted against manufacturing errors and defects in materials, and the warranty period is 12 months starting from the day of delivery to the customer. The warranty period of Dental Contra-angle Handpiece is 6 months starting from the day of delivery to the customer
2. **MotorTurbo** should be repaired by the equipment technology department of Changzhou Sifary Medical Technology Co., Ltd. or maintenance service partners authorized by Changzhou Sifary Medical Technology Co., Ltd. Do not provide circuit diagram, bill of material, legends, calibration rules, and other maintenance materials to other organizations.
3. Should the quality assurance complaint be reasonable, Changzhou Sifary Medical Technology Co., Ltd. or maintenance service partner authorized by Changzhou Sifary Medical Technology Co., Ltd. shall provide repairing service as soon as possible.
4. Should the damage be proved to be caused by the user's negligence in daily maintenance, warranty is then voided.
5. Changzhou Sifary Medical Technology Co., Ltd. reserves the right to analyze and determine the cause of any problems.

14.Statement

Shelf Life

The shelf life of **MotorTurbo** series products is 5 years.
To ensure continued safe use of **MotorTurbo**. It is recommended that the equipment (motor and host) be checked and repaired at the dealer once a year.

Maintenance

MANUFACTURER will provide circuit diagrams, component part lists, descriptions, calibration instructions to assist to SERVICE PERSONNEL in parts repair.

Disposal

The package should be recycled. Metal parts of the device are disposed as scrap metal. Synthetic materials, electrical components, and printed circuit boards are disposed as electrical scrap. Please deal with them according to the local environmental protection laws and regulation.

Rights

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 CHANGZHOU SIFARY MEDICAL TECHNOLOGY CO., LTD. The industrial design, inner structure, etc, have claimed for several patents by SIFARY, any copy or fake product must take legal responsibilities.



Any serious incident should be reported to manufacturer and competent authority



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