



The image shows a white and blue Manta Cordless Endodontic Handpiece standing upright in its white charging dock. The handpiece has a digital display showing '450' and '40', and buttons labeled 'S' and 'P'. The dock also has a 'WHITE' logo.

manta[™]

Cordless Endodontic Handpiece

INSTRUCTION MANUAL

This product is a cordless handpiece for root canal treatment. This motor is only for use in hospital environment, clinic or dental office by a qualified dental personnel. Before using read this Manual carefully before use for operation instructions, care and maintenance. Keep this operation Manual handy for future reference.

※ The company may switch the specification or design without advanced notification.

Table of contents

INTRODUCTION

USER GUIDELINES

PRODUCT FEATURES & ADVANTAGE

PRODUCT COMPONENTS

PART NAME OF PRODUCT

BUTTONS ON THE OPERATION PANEL

LCD WINDOW

CONNECTION OF EACH PART

OPERATION PROCESS

MAINTENANCE OF THE PRODUCT

ATTENTION

PRODUCT SPECIFICATION

ELECTROMAGNETIC COMPATIBILITY INFORMATION

WARRANTY

SYMBOL



INTRODUCTION

This product is a **medical device**.

Make sure to read this manual before operation.

This manual is to insure the proper installation and use.

Carefully read this manual in order to best use this product and make sure its lifespan is prolonged.

Please special pay attention to indicators marks such as , , .

<User>

- For Qualified Professional ONLY

<Intended use>

- ACL(B)-41EP are for use by dentists for standard endodontic procedures when using rotary files and rotary endodontic drills(Gates-Glidden)

<Classification of Equipment>

- Type of protection against electric shock: Class II equipment
- Degree of protection against electric shock: Type BF applied part 
- Classified according to the degree of protection against ingress of water as specified in the current edition of IEC 60529.
 - Motor handpiece: IPX0
 - Charger: IPX0
- Not suitable to be used in an atmosphere that has a flammable anesthetic mixture with air or with oxygen.
- User sterilized product (non-sterile product at shipment)
- Classification according to mode of operation: Non-continuous operation
- Applied parts: bur, file.

<Use Time>

- Loading Time: max. 3 minutes
- Resting Time: min. 10 minutes

<Operation & Storage Condition>

Operation Condition	Temperature (°C)	10~30
	Relative Humidity (%)	10~80
	Atmospheric Pressure (hPa)	700~1,060
Transport and Storage Condition	Temperature (°C)	-20~60
	Relative Humidity (%)	10~90
	Atmospheric Pressure (hPa)	500~1,060



USER GUIDELINES



CAUTION

- Please consider the safety of patient first and use the proper care during product operation.
- Only Professional person licensed for dental surgery can be allowed to use the product.
- Do not use motor with a file which is bent, damaged, deformed and/or not in accordance to ISO standard, otherwise, it might cause injury.
- Do not place or keep the battery in a high temperature environment such as a place exposed to direct sunlight, inside a car, etc.
- Please check, vibration, noise and temperature of the product before using and test by simply rotating a file. Stop using the product if any abnormal condition is detected and contact a representative from the company.
- Keep bur or file clean, otherwise dust might create a poor chucking power and it may cause vibrations during operation.
- Before changing the file or bur, turn off the power.
- When inserting the motor handpiece into the battery charger, always position the handpiece correctly. Forcibly pushing it into the charger in an incorrect direction may cause damage.
- Place the motor handpiece into the charger after cleaning any liquid or dust off. If the charging terminal is dirty, it may not charge the unit properly.
- User is responsible for the operation, maintenance and inspection of the unit.
- Any Application of the unit is restricted to this manual and any not-recommended application by the manufacturer should be avoided.
- Keep the speed of the bur/file as recommended by the bur/file manufacturer. Excessive speed can cause an accident.
- Contact the company when display shows an incorrect message, it could cause an accident.
- Only recommended product and consumable parts by manufacturer can be used with the product, otherwise, it may cause an accident.
- Manufacturer may change specification and design of this product at any time in order to improve the quality.
- Before use, please check if the control unit has set the gear ratio properly to match with the gear ratio for the contra angle.
- If motor operating speed runs too fast or stops during operation, contact the company.
- Take care not to drop or damage the motor or contra angle handpiece. Do not operate the product if product is not running properly after dropping on the floor or in contact with water. In that case, bur vibration, excessive heat or damage to the ball bearings may occur.



Warning

- The motor handpiece designed is Ni-MH battery (rechargeable). A Ni-Cd battery is possible to use but the charging time and usage period can be shortened due to the charging current being different.
- The product is recommended to be charged before use.
- This product has not been sterilized when released by the manufacturer.
Please sterilize before using (sterilization by user).



Prohibited

- Only Rechargeable battery (Ni-MH battery) is allowed to be used. Do not use manganese or alkaline battery. If mishandled, that can cause leakage or damage to the battery.
- Do not touch the AC power plug with wet hands. That can cause electrical shock.
- Do not drop any kind of liquid or water on the handpiece motor or charger. A short circuit may cause fire, electric shock or corrosion to the product.
- Unauthorized modification and dismantling is prohibited.
- Be sure to use designated bur by ISO 1797.
- Do not drop the motor handpiece or charger. Install on flat ground and safe place.
- If the battery leaks, do not allow the battery liquid to come into contact with your skin, eyes or clothes.
- If the battery leaks from the handpiece motor or a change of color in the exterior of the handpiece motor, stop using and contact the company.
- If the product is not in use for a long period of time, disconnect the battery.
- Please use the correct designated battery and charger for the product.
- System damage could occur if the product is used near a electromagnetic interference.
- Do not use the product near any flammable product or nitrous oxide.
- The product has a circuit which can protect against file damage. However, the file can be damaged by using extreme torque.
- Do not touch signal input, signal output or other connectors and the patient simultaneously.
- External equipment intended for connection to signal input, signal output or other connectors shall comply with relevant IEC Standard. (e.g., IEC60950 for IT equipment and IEC60601-1 or IEC60601-1-1 series for medical electrical equipment) If in doubt, contact the company.



PRODUCT FEATURES & ADVANTAGES

<Feature>

- Simple interface design for easy control
- Freedom of mobility during operation by wireless handpiece
- Ergonomic and compact body

* rpm:

Gear Ratio	20:1
rpm	100 ~ 600 rpm



- The free-running speed of the handpiece shall be in accordance with the manufacturer's instructions at a tolerance of $\pm 10\%$ as specified. (Refer to ISO 14457)

* Torque:

Gear Ratio	20:1
Torque	1 ~ 4 N·cm

* Gear Ratio: 20:1

<Program function>

- 1~5 programs are available to set
- 5 memory programs of (gear ratio, torque, rpm, auto reverse) are available to set.

<Setting torque limit function>

- During the procedure, if the actual load exceeds the set torque value, the motor will rotate in reverse rotate automatically.
- At this time when exceeding the existing set torque value, E1 will appear and the rotation will stop automatically.

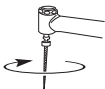
<Auto reverse mode>

- Users can choose auto-mode according to the operation condition.
 - If the load reaches the torque limit value, it starts in reverse with a "beep" sound.
- At this time, the auto reverse modes are available.

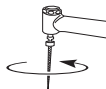


Auto stop

: Motor moves in a reverse movement. After removing the load, handpiece stops.
To operate in a forward movement, press On/Off button again.



* Operation within the setting torque value
Forward



* Reverse rotation when exceeds setting torque value
Reverse

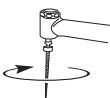


* Stop when a load is removed
Stop

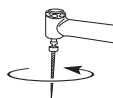


2. Auto reversing

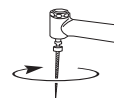
: If the load is removed after auto reverse rotation, it returns to the normal rotation again.



* Operation within the Setting torque value
Forward



* Reverse rotation when exceeds set torque value
Reverse



* Forward rotation when a Load is removed
Forward



- The battery is drained (when replace with no remaining amount of the battery mark is indicated), the actual load may not reach the setting torque limit value. In this case (in the case of operation by battery), the auto reverse function will not be activated. When high torque is required, use the adaptor.
- If a load is continuously applied to the motor, it may automatically stop to prevent overheating. In this case, turn the unit off until it cools down.

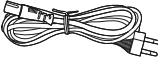
<Auto-OFF function>

- Power is off with a "beep" sound after 4 minutes when unit is not being used.



PRODUCT COMPONENTS

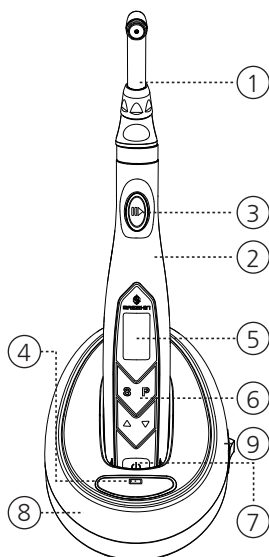
* Please check that all components are included.

①		③	
②		④	

No	Component	No	Component
1	Handpiece	3	Charger
2	Motor	4	Power cord



PART NAME OF PRODUCT



- (1) Handpiece
- (2) Motor
- (3) Motor ON/OFF Button
- (4) Charging LED
- (5) LCD Operation Panel
- (6) Operation Button
- (7) Power button
- (8) Charger
- (9) Charger ON/OFF Switch

BUTTON ON THE OPERATION PANEL



Power Button

- : Push the power button until the power is on and the LCD panel lights.
- Push the power button until power is turned off for 1-2 seconds.



Select-S Button

- This button is to select the setting for the gear ratio, torque, auto reverse.



Program-P and Memory Button

- : Select a program from 1 to 5 and use this button to save the memory.



UP/Down Button

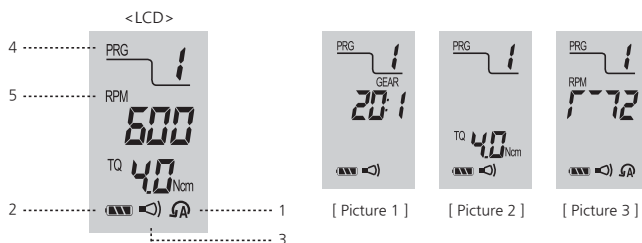
- : To set needed rpm, gear ratio, auto reverse use the Up/Down button.
- ※ The setting range of rpm and torque are different from gear ratio.



Motor ON/OFF Button

- : Push the button, then motor runs and stops.

LCD WINDOW



1. Auto reverse mode display

- : Shows the currently selected auto reverse mode. (no display on the screen or )

2. Battery display

- : Shows 3 steps for charging level.

3. Beep display

- : Beep sound function each operating condition.

4. Program display

- : Shows the program number currently selected. 1~5 are displayed and 5 can be saved.
- If the unit power is turned-off and on again, it will always return to the last program used.

5. RPM display

- : The current set rotational speed is displayed.

6. Gear ratio selection screen

- : The current set gear ratio is displayed. Used for changing gear ratio.

7. Torque selection screen

- : The current set torque value is displayed. Used for changing torque value. (Unit N.cm)

8. Auto reverse mode selection screen

- : The current set auto reverse mode is displayed. Used for changing auto reverse mode.

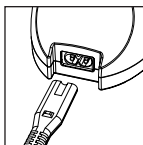


- Be careful that the LCD on the handpiece motor could get damaged from a severe impact or by dropping it.

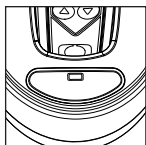
● CONNECTION OF EACH PART

1. Connection of charger

- ① Connect the power cord to the power cord connection socket on the back of the charger. (Picture 1)
- ② Insert the power cord and plug it in.
- ③ Insert the handpiece motor into the charger with the unit facing forward. (Picture 2)



(Picture 1)



(Picture 2)

2. Connection of handpiece

Handpiece can be connected to motor at any position.

Align handpiece positioning pins with the positioning slots of motor and

insert the head until a "click" sound is heard and pull it out axially when removing.

When removing, hold the motor and pull the handpiece out.

Handpiece



- Check if the handpiece connected properly to the motor.

3. Connecting and disconnecting a file

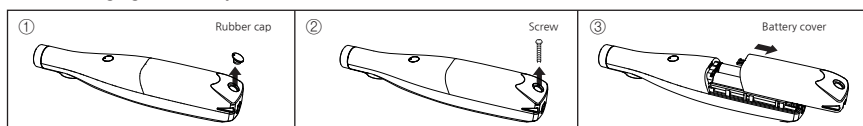
- ① Connection : Slide the file inwards by matching the home position until the handpiece clicks.
- ② Disconnection : Press the button on the head to pull out the file.

Handpiece



- Turn off the power when inserting or removing a file.
- Try pulling out the file to confirm it is locked in.
- Keep the chuck of handpiece single space only clean at all times. The file can become unbalanced or the chucking power can become weakened if debris gets inside the chuck.

4. Changing the Battery



- ① Remove the rubber cap from the motor.
- ② Use a Phillip's screwdriver to loosen the screw.
- ③ Open the battery cover to remove the battery. Check the positive and negative poles of the product and install new batteries properly. Reassemble the cover and screw on the cover.



- Use batteries of the correct rating of: (DC 1.2V, 750mAh / 2 pcs)
- When replacing the battery, make sure to check the direction of the + poles and - poles.



OPERATION PROCESS

1. Turn on the power by pressing the Power button ().
2. Press the Program button () to find the appropriate program for your file.
3. If no program has been set, set as below.
 - ※ The program can be set from 1 to 5 and the user can set up to the desired value.
4. Press the Up/Down buttons () to set the rotation speed to use.
5. Press the Select-S button () to set the gear ratio, torque and auto reverse mode to use.

Each mode uses the Up/Down buttons () to set the desired value.
6. After setting, press and hold the Program button () for 2 seconds to memorize the program with a beep sound.
7. Press the Motor ON/OFF button () to operate.
8. When the procedure is complete, press the Motor ON/OFF button () to stop motor from operating
press the Power button () to turn it off.



- * If you do not press the program button for 2 seconds and you do not hear a beep, the program will not be saved. In this case, the initially stored value is retained.
- * When the power is turned off after operating the handpiece, the last setting used is saved. Therefore, make sure to confirm the setting value you want to use.
- * The power will turn off automatically after 4 minutes without the ON/OFF button in operation. (Auto power off function)
However, if the motor is running regardless of it being used, the power will not be turned off automatically.

■ Battery charge

1. Connect the power cord to the power cord connection socket on the back of the charger.
2. Insert the power cord and plug in.
3. Turn the power switch ON. At this time, the power lamp is turned on with beep sound.
4. Plug the motor into the charger with it facing forward.

The charging lamp lights up and charging starts.
5. Orange light is on during charging and green light is on when fully charged.
 - ※ Orange light blinks in case of short circuit or battery failure. In this case, charge new battery after replacing it.

If the same issue occurs after the battery is replaced, consult the company.

		
Charging	Fully charged	Battery failure/short circuit



- Never use the charger for any other purpose than to charge the motor.
- If the battery is left in the motor for a long time and then charged, the battery may not charge properly.



- The full charge time is about 2,5 hours, but it may be different depending on battery usage, new or old batteries, and general operating environment (temperature and humidity) conditions. Older batteries may have a shorter charging life.
- While charging, the battery part may get slightly heated, but this is not a malfunction.
- Charging completion time may vary depending on the remaining battery charge.
- Charge the handpiece during the motor resting time.

■ Error and remedy

Error code	Cause & Remedy
	Cause: Torque is overloaded from the setting values during the procedure. Remedy: Press the Motor ON/OFF button to release the error. Contact the company if this remedy does not activated the unit.

■ Problem and remedy

* When trouble is found, check the following before contacting the company. If none of these are applicable or the trouble is not remedied even after action has been taken, please contact the company.

Problem	Cause	Remedy
The power of motor handpiece does not turned on	Battery is dead.	Charge the battery.
	Battery has not been inserted.	Insert the battery.
The temperature of handpiece motor is hot	The temperature of battery is hot.	It is normal for the battery to get warm right after charging. If the battery gets hot during normal operating conditions, there may be an abnormality. Contact the company.
The charger does not work. (The charge lamp does not light.)	The plug of the charger is not inserted into the outlet, or there is no electricity from the outlet.	Check the connections.
	Internal fuse has burnt.	Contact the company.
The motor handpiece does not rotate.	Head of contra angle is stuck.	Clean the head or change it.
	Bonding of motor gear got detached.	Contact the company.



MAINTENANCE OF THE PRODUCT

1. Cleaning

■ Handpiece

- ① Rotate the head in tap water for about 10 seconds with maximum speed to remove the remains (blood, physiologic saline solution, etc.) and rinse.
 - ※ Do not put tap water in the motor.
- ② Disconnect the handpiece from the motor.
- ③ Remove contaminants on the handpiece using a nylon brush after soaking for 20 minutes in Enzymatic Detergent.
- ④ Rinse the handpiece using tap water for 3 minutes to remove Enzymatic Detergent.
- ⑤ Wash the handpiece for 10 minutes in an ultrasonic cleaner containing Enzymatic Detergent.
- ⑥ Rinse the handpiece for 3 minutes in an ultrasonic cleaner containing purified water and repeat 3 times. (Change the purified water each time.)
- ⑦ Use a dust-absorbent Wipe after the product has soaked in alcohol (70%) for 30 seconds.



- Do not use solubilizers like a thinner or benzene for cleaning.

■ Motor & Charger

Wipe the surface of the motor and charger with an alcohol swab or paper towel after removing debris.

- ※ Pay attention to not allow water to enter into the motor and charger.

2. Sterilization

Sterilization product list

● Handpiece

Sterilization method

- ① Dry the applicable products completely after cleaning.
- ② Put the product in a sterile bag and seal tightly.
- ③ Put the sterile bag in the sterilizer for 4 minutes with on 132°C, and let it dry for 30 minutes.



Sterilization	Temperature	Time	Dry time
Moist heat sterilization	132°C	4 minutes	30 minutes



- This product is designed to withstand the sterilization process a minimal of 250 times.
- Its recommended to use moist heat sterilization (autoclave), other sterile methods do not sterilize effectively.
- Make sure to use a sterilization bag and seal tightly.
- Make sure to dry the applicable products before sterilization.
- If sterilization is performed with blood or etc. remaining inside, it may harm the product.
Be sure to clean and lubricate the handpiece before sterilization.
- Before using, dry the product completely.
- Do not sterilize the motor as it is not designed for sterilization.

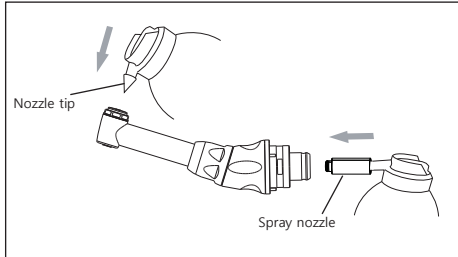
3. Lubrication

Lubrication product list

- Handpiece

Lubrication method

- ① Insert the nozzle to handpiece motor assembly part (the end part of handpiece) and spray lubricant for 2~3 seconds.
- ② Insert the nozzle tip to the head part and spray lubricant for 2~3 seconds.



* Nozzle tip and spray nozzle for handpiece is not provided.



- * For continuous operation, please put the oil in every hour.
- * When lubricating, please hold the handpiece angle firmly because it can shoot out by the spray pressure.
- * Do not insert the oil into the motor. It may cause it to fail.
- * When cleaning handpiece, do not use solvent systems such as benzene or thinner, and do not wash plastic products (charger, motor) with aldehyde.
- * Place the handpiece in a suitable place or tilt it to allow oil to escape.
After the oil is completely dry, connect to the motor.
- * Be sure to remove any residual oil before fitting the lubricated handpiece to the motor.
- * Lubrication spray is not included as a component.
- * Caution: Lubrication spray presents a combustible hazard.
- * Use FDA approved lubricant. (K052700 equivalent lubricant.)



ATTENTION

1. Please read the notice below before operating the product.

- 1) Make sure that the motor is fully charged.
- 2) Make sure to check any part in contact with patient.
- 3) Check the sterile condition of any autoclavable parts.

2. Please read the notice below during the product use.

- 1) Constantly check the status of the product and patient during surgery.
- 2) When product or patient has any problem, stop the operation for the patient's safety and take the proper action.
- 3) Do not let patient approach or touch the product.

3. Please read the notice below after operating the product.

- 1) Charge the motor by plugging it into the charger.

4. When the products are not being used for a long period of time, please be advised to the following.

- 1) Remove the battery in the motor.
- 2) Turn off the charger power and unplug the cord. Check the cord regularly and replace it when it is damaged.
- 3) Clean and sterilize.
- 4) Keep the products in the recommended condition.



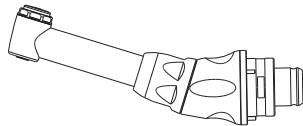
PRODUCT SPECIFICATION

1. Motor



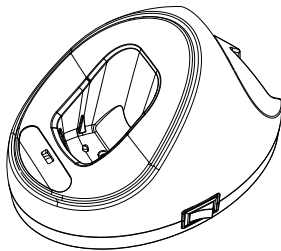
Model name	TRAUS MCE10XX
Input	DC 4.5V
Output	DC 2.4V
Battery charging time	Approx. 2.5 hours
Battery discharging time	Approx. 9 hours (No load)

2. Handpiece



Model name	ACL(B)-41EP
Gear ratio	20:1
Bur replacement type	Button type
Bur dimension	CA Bur (Ø 2.35)

3. Charger



Model name	TRAUS XEW10
Input	AC100-240V, 50/60HZ, 0.1A
Output	DC 4.5V
Power consumption	7.5VA



ELECTROMAGNETIC COMPATIBILITY INFORMATION

In IEC/EN 60601-1-2 4th edition. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation space between the equipment.
- Connect the equipment into an outlet on a circuit different from which the other device(s) are connected.
- Consult the manufacturer.

Electromagnetic Emissions		
The MANTA ENDO unit is intended for use in an electromagnetic environment specified below. The user of the MANTA ENDO unit should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment - guide
RF emission - CISPR 11 EN 55011	Group 1	MANTA ENDO unit uses RF energy for internal operation. Therefore, its radiofrequency emissions are very low and are not likely to cause any interference with nearby equipment.
RF emission - CISPR 11 EN 55011	Class A	MANTA ENDO unit covers devices for usage in all establishments other than domestic and that are not directly connected to a low voltage power supply network, which supplies domestic environment. This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take the appropriate measures.
Harmonic emission - IEC 61000-3-2 EN 61000-3-2	Class A	
Voltage fluctuations Flicker emission - IEC 61000-3-3 EN 61000-3-3	Compliance	

Electromagnetic Immunity

The MANTA ENDO unit is intended for use in an electromagnetic environment specified below.
The customer or the user of the MANTA ENDO unit should assure that is used in such an environment.

Emission test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2 EN 61000-4-2	±8kV contact ±15kV air	±8kV contact ±15kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transients IEC 61000-4-4 EN 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Main power quality should be that of a typical commercial or hospital environment.
Surges IEC 61000-4-5 EN 61000-4-5	±1kV differential mode ±2kV common mode	±1kV differential mode ±2kV common mode	Main power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations IEC 61000-4-11 EN 61000-4-11	0 % UT for 0.5 cycle at 8 Φ angles 0% UT for 1 cycle 70 % UT for 25/30 cycles 0 % UT for 250/300 cycle	0 % UT for 0.5 cycle at 8 Φ angles 0% UT for 1 cycle 70 % UT for 25/30 cycles 0 % UT for 250/300 cycle	Main power quality should be of a typical commercial or hospital environment. If the user requires continued operation during power outage interruptions, it is recommended that the MANTA ENDO unit gets power from an uninterruptible power supply or battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8 EN 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a commercial or hospital environment.

NOTE: UT is the AC main voltage prior to application of the test level.

Electromagnetic Immunity			
The MANTA ENDO unit is intended for use in an electromagnetic environment specified below. The user of the MANTA ENDO unit should assure that is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6 EN 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms In ISM bands from 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz 6 Vrms In ISM bands from 150 kHz to 80 MHz	Portable and mobile RF communications equipment should be used no closer to any part of the MANTA ENDO unit including cables, than the recommended separation distance space calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3 EN 61000-4-3	3 V/m 80 MHz to 2.7 GHz	3 V/m 80 MHz to 2.7 GHz	Recommended separation space distance $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P} \text{ 80MHz to 800MHz}$ $d = 2.3 \sqrt{P} \text{ 800MHz to 2.7GHz}$ Where 'P' is the maximum output power rating of the transmitter in watt (W) according to the transmitter manufacturer 'd' is the recommended separation distance space (m). The electromagnetic field strength of fixed radiofrequency emitters, which is determined by an electromagnetic environment measurement (a), must be less than the compliance level in each frequency range (b). Interference may occur near equipment marked with the symbol below: 
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These specifications may not be applicable in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and persons.			
(a): The electromagnetic field strength of fixed radiofrequency emitters, such as base stations for mobile telephones (cellular / cordless), mobile radio, AM/FM radio broadcasts and TV broadcasts cannot be determined exactly by theory alone. To assess the electromagnetic environment due to fixed radiofrequency emitters, an electromagnetic environment measurement must be made. If the measured radiofrequency field strength in the immediate environment where the product is used exceeds the compliance level specified above, the performance of the product must be tested to verify whether it conforms to the specification. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the product. (b): In the 150 kHz to 80 MHz frequency range, the electromagnetic field strengths must be less than 3V/m.			

Recommended separation distances between portable and mobile RF communications equipment and the MANTA ENDO unit

The MANTA ENDO unit is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The user of the MANTA ENDO unit can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MANTA ENDO as recommended below, according to the maximum output power of the communications equipment

Rated maximum output Power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz ~ 80 MHz $d = 1.2 \sqrt{P}$	80 MHz ~ 800 MHz $d = 1.2 \sqrt{P}$	800 MHz ~ 2.7 GHz $d = 2.3 \sqrt{P}$
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 higher frequency range applies.

Note 2: These specifications may not be applicable in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and persons.

Cables and accessories	Maximum length	Shield	Complies with	
AC power cord	1.8 M	Unshielded	RF emissions, CISPR11	Class A / Group 1
			Harmonic emissions	IEC 61000-3-2 EN 61000-3-2
			Voltage fluctuations / flicker emissions	IEC 61000-3-3 EN 61000-3-3
			Electrostatic discharge (ESD)	IEC 61000-4-2 EN 61000-4-2
			Electrical fast transient / burst	IEC 61000-4-4 EN 61000-4-4
			Surge	IEC 61000-4-5 EN 61000-4-5
			Voltage dips, short interruptions and voltage variations on power supply input lines	IEC 61000-4-11 EN 61000-4-11
			Power frequency (50/60Hz) magnetic field	IEC 61000-4-8 EN 61000-4-8
			Conducted RF	IEC 61000-4-6 EN 61000-4-6
			Radiated RF	IEC 61000-4-3 EN 61000-4-3

Description for BASIC SAFETY and ESSENTIAL PERFORMANCE

The MANTA ENDO unit is intended for use in an electromagnetic environment specified above.

The following essential performance for the MANTA ENDO should be running in such an environment.

- 1) The measured RPM by tachometer shall be within 600 rpm $\pm$ 10 %

WARRANTY

SS White guarantees the product for 1 year from invoice date, and product warranty means that SS White has responsibility for defective material or operation failure. The product warranty does not cover user's misuse, wrong installation, inappropriate maintenance and repair, and normal wear of consumables such as bearings, spindle, gear, and motor. To check the warranty of the product SS White requires the operating condition, environment, serial number of the product and stamped invoice. The warranty will be performed as a repair or exchange according to the manufacturer's judgement and analysis of product.

Warranty Exception

User's misuse or improper use and treatment
 Use the product with incorrect input voltage (AC voltage)
 Drop the device during setting, moving or using
 Use not recommended consumables or accessories
 Malfunction after repairing the product by not using SS White's repair service
 Normal wear of the consumables such as ball bearing, gear, chuck, spindle case assembly, motor, etc.
 Fault by Act of God

Foreign language manual support

This manual is offered in Korean and English. If other languages are needed, please contact SS White for a different version of the manual.

SYMBOL

	Power button		Up/Down Button
	Select-S button		Motor On/Off button
	Program-P/Memory button		Consult instruction for use
	Manufacturer		General mandatory action sign
	EU Representative		General warning sign
	Serial Number		General prohibition sign
	Autoclave		CE Marking
	Type BF		Class II equipment
	This product should not be mixed with other commercial wastes for disposal.		Non sterile



This product is medical device.



SAESHIN
SAESHIN PRECISION CO., LTD.
52, Secheon-ro 1-gil, Dasa-eup,
Dalseong-gun, Daegu, Korea
Tel. 82-53-587-2341 / Fax. 82-53-580-0999

www.saeshin.com / traus@saeshin.com



MERIDIUS MEDICAL EUROPE LIMITED

Unit 3D, North Point House North point
Business Park New Mallow Road CORK,
T23AT2P, Ireland
+353 212066448

Made in KOREA

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