



E n d o CUBE

INSTRUCTION MANUAL





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INTRODUCTION

This product is medical device.

Make sure to read this user manual before using.

This user manual is to assure proper installation and use.

Pay attention to read this user manual in order to making the best use of this product and to assure the prolonged lifespan before using.

Specially, pay attention the contents with marks such as  ,  and .


<User>

- Qualified Professional

<Intended purpose>

- Engine that power the implant handpiece in dental implant procedure.
- The E-CUBE is indicated for use by dentists in standard endodontic procedures using rotary endodontic files and rotary endodontic drills.

<Classification of equipment>

- Type of protection against electric shock: Class I equipment
- Degree of protection against electric shock: Type B applied part 
- Classification according to the degree of protection against ingress of water as detailed in the current edition of IEC 60529
 - Control Box: IPX 0
 - Foot Controller: IPX 1
- Not suitable product in the atmosphere that exist flammable anesthetic mixture with air or with oxygen.
- User sterile product (non-sterile product at shipment)
- Classification according to mode of operation : Intermittent operation
- Applied parts: Bur

<Use time>

- Loading time: 3 minutes
- Resting time: 10 minutes



USER GUIDELINES



CAUTION

- Please pay attention to the use considering the patient's safety first of all.
- Check condition of the product before use.
- Stop to use and inspect the product when an abnormal sign such as calescence, vibration or noise occurs before or during operation.
- Please contact manufacturer if cannot find reason of problem, or cannot solve the problem.
- Prepare extra consumables before use for safety because blood or physiological saline might flow into the head of angle handpiece.
- Replace the bur or file after the motor is completely stopped. Otherwise, inside of the angle could be damaged, and it could cause an accident.
- Please sterilize and lubricate the handpiece right after use. Otherwise, the product could be damaged due to coagulation of blood inside the product.
- The control box, motor, foot controller and adaptor are not steam sterilization objects
- Contact manufacturer if incorrect display is on the screen.
- Do not drop or give a strong impact to the product.
- Do not insert oil into BLDC motor. It will damage bearing or cause calescence.
- The product is designed to be used indoor, do not use outdoor.
- Do not use the product in humid or dusty environment.
- Use the regulated products and consumables by manufacturer. Otherwise there might be a risk of an accident or failure.
- Replace the motor cord immediately when it is worn out or damaged to prevent electric shock for user or patient.
- Specification and design of product can be changed to improve quality of product.
- User has responsibility to operate and maintain the product.
- The company did not sterilize the product. Please be sure to sterilize before operation.
(User sterilization)
- Used and finished battery is recommended to be back to supplier. The product use battery which is composed of Nickel Metal Hydride, rechargeable, however, some countries stipulate it to be disposed as special waste.
- US Federal law restricts this device to sale by or on the order of a dentist.



WARNING

- Please watch old person, children, or disabled person near the place that the product is installed. If so, do not let them alone.
- Do not drop or damage the handpiece. In case of malfunction, dropping, or dropping in water, do not use it and contact the manufacturer.
(It may cause vibration of bur or file, overheating, or damage of the bearings.)
- The equipment is automatically stopped when the machine load is higher than Torque value.
- Do not damage or drop the LCD part of the control box.



PROHIBITION

- Do not use damaged or broken power cord, plug, and outlet. It may cause fire and electric shock.
- When unplug the power cord, hold the plug and do not touch with wet hand. Do not use loose power cord, it may cause electric shock and fire.
- Do not damage to power cord (do not bend too hard, do not put heavy objects on it). It may cause electric shock and fire.
- Unauthorized modification and dismantling is prohibited.
- Do not use the solvent such as thinner or benzene for cleaning.
 - ※ Be careful not to drop liquid on control box.
 - ※ Do not wipe the control box (membrane) with wet fabric.
- Do not place the product near heat equipment, and do not put candles or cigarette on it.
- Be sure to use designated bur or file by ISO 1797.
- Follow the instruction manual by manufacturer of part to use bur or file.
- Keep the recommended speed limit by manufacturer of part to use bur or file. If exceed the speed limit, it might cause an accident.
- Do not use the bur or file that was bent, broken and transformed.
- The product must be used by specialist or expert. If not, patient might get burn or damage by improper use.
- Do not use the product to patient with cardiac pacemaker because the product may disturb the performance of cardiac pacemaker.
- If patient is taking antibiotics, patient needs to consult with doctor before operation.
- Keep away from fire or heat when using spray containing flammable material.
- Manufacturer does not have any responsibility for defects or loss of property in cases below.
 1. User did not follow the instruction manual to use the product.
 2. Used the product in the place of unregulated wire condition.
 3. Unauthorized person repaired or assembled the product.
 4. Did not follow the instruction manual to keep the product.
- Only Rechargeable battery(Ni-MH battery) is allowed to be used. Do not use manganese and alkaline battery. If mishandled, that causes leakage or ruptures.
- If the batteries leak, do not allow the liquid to come into contact with your skin, eyes or clothes.



PRODUCT FEATURES & ADVANTAGES

<Endo Mode>

- Max. RPM :

1:1	4:1	10:1	16:1	20:1
13,000 RPM	3,250 RPM	1,300 RPM	800 RPM	650 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)

- Max. Torque :

1:1	4:1	10:1	16:1	20:1
-- N-cm	1.3 N-cm	3.2 N-cm	5.2 N-cm	6.5 N-cm

- Gear Ratio: 1:1, 4:1, 10:1, 16:1, 20:1

<Program Memory Function>

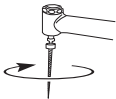
- 9 programmable memories for setting gear ratio, torque, speed, rotating direction and etc.

<Automatic Overload Protection Function>

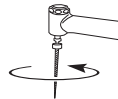
- The function is operated when the torque value exceeds the setting value. It can be choose three modes below.

AUTO REVERSE

If torque value exceeds the setting value, the handpiece rotates in reverse automatically. When a load is removed, the handpiece stops.



Operation within the setting torque value



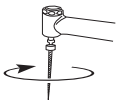
Reverse rotation when exceeds setting torque value



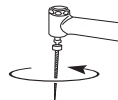
Stop when a load is removed

AUTO REVERSE

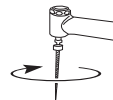
If torque value exceeds the setting value, the handpiece rotates in reverse automatically. When a load is removed, the handpiece rotates in forward.



Operation within the setting torque value



Reverse rotation when exceeds setting torque value



Forward rotation when a load is removed

(EMPTY)

If torque value exceeds the setting value, the handpiece stops.



- When the batteries go down (when the remaining amount of the batteries mark indicates), the actual load may not reach the preset torque limit value. In this case (in the case of operation by batteries), this auto reverse function will not be activated. When high torque is required, use the adaptor or use this product in a condition where the batteries are not significantly consumed (when the mark of the remaining amount of the batteries indicates).

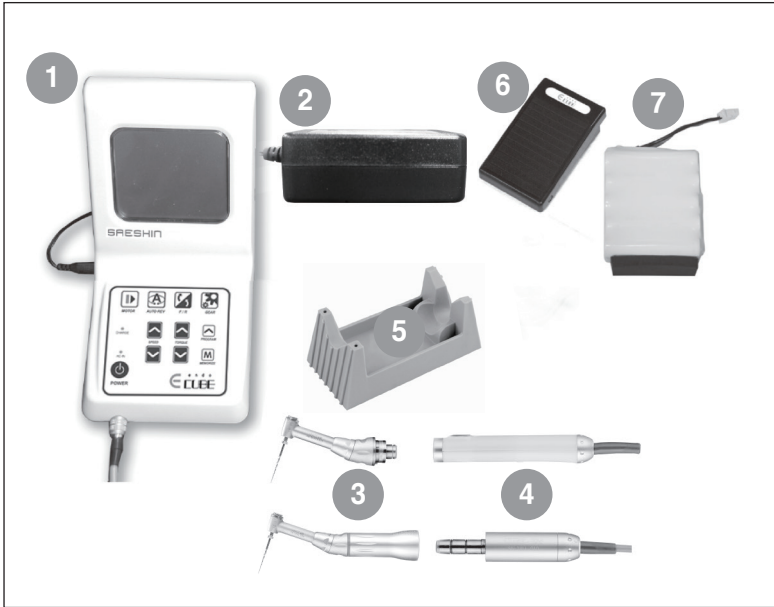
- If a load is continuously applied to the motor, it may automatically stop to prevent overheating. In this case, leave the motor for a while until it cools down. When the display returns to normal, the product can be used.

<Automatic Power OFF Function>

- Power is off with beep sound after 10 minutes without operation. (During the motor operation even without use, power is not off automatically.)

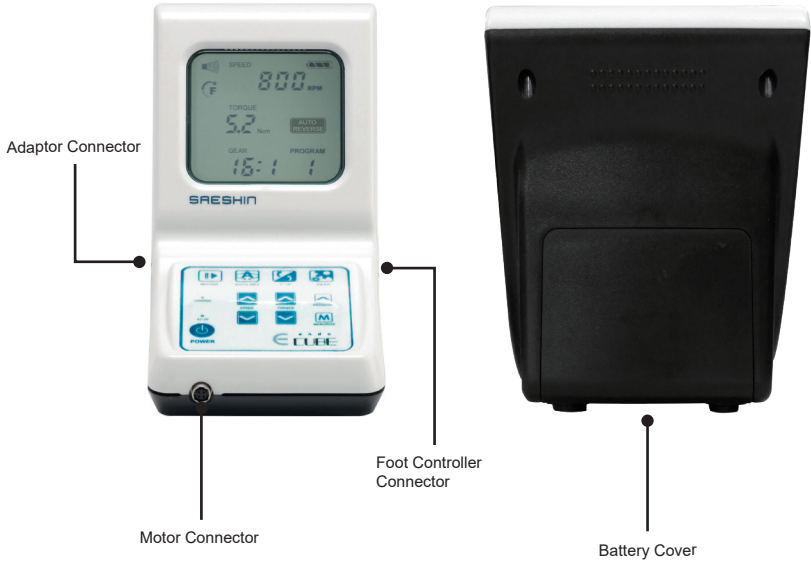
PRODUCT COMPONENTS

* Please check all components are included.



No.	Component
1	Control Box
2	Adaptor
3	Angle Handpiece (Option)
4	Motor Handpiece (Option)
5	Motor Stand
6	Foot Controller
7	Battery (Including in the control box)

● PART NAME OF CONTROL BOX





BUTTONS ON THE OPERATION PANEL



POWER

Power Button

: Push the power button over the 1 second, power is turned on/off.



MOTOR

Motor Button

: Push the motor button, Motor runs or stops.



AUTO REV.

Auto Reverse Button

: Use for setting the automatic reverse mode. Three modes can be selected.



F / R

Operation Direction Button

: Use for selecting the rotary direction. The beep sound is heard during rotation in reverse direction.



GEAR

Gear Ratio Button

: Use for setting the gear ratio. Press and hold the button, can select the desired gear ratio quickly.



CHARGE

Charging LED

: The LED is turned on during charge the battery. The LED is turned off when battery charging completely. (It is not related to power ON/OFF.)



AC-IN

Adaptor LED

: The LED is turned on if adaptor is connected to control box.



SPEED



Speed Button

: Use for setting the speed(RPM). Press and hold the button, can set the desired speed.



TORQUE



Torque Button

: Use for setting torque. Press and hold the button, can set the desired torque.



PROGRAM

Program Button

: Use for selecting the program number. Press and hold the button, can select the program in reverse.

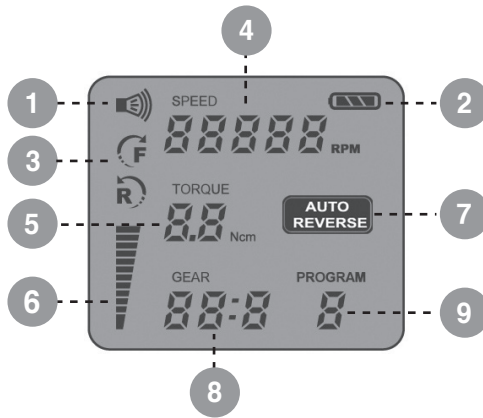


MEMORIZE

Memory Button

: Use for saving the setting condition. Press and hold the button, can save the setting condition to preset program number with beep sound.

LCD WINDOW



1. Beep Sound Display

: It shows the beep sound.

2. Battery Display

: There are three bars which indicate battery power and each bar display about 30-35% of power condition. If there's no battery bars, the battery must be discharged or has very low voltage condition so battery have to be recharged.

3. Rotary Direction Display

: It shows the selected rotary direction.

4. Speed Display

: It shows the preset RPM.

5. Torque Display

: It shows the preset torque.

6. Load Display

: It shows the load condition of motor during operating.

7. Automatic Reverse Direction Display

: It shows the selected automatic reverse direction mode.

8. Gear Ratio Display

: It shows the selected gear ratio.

9. Program Number Display

: It shows the selected program number.



CONNECTION OF EACH PART

1. Motor Connection

: Please insert the pins of motor cord to the holes position of control box carefully.



- To remove the motor, hold the plug ring and pull it out.

2. Adaptor Connection

: Please insert the adaptor plug into the adaptor connector exactly. (When charging the battery.)



- Please use the designated adaptor only. Adaptor-LED shows the connection condition of adaptor, so adaptor-LED is not turned off after complete charging. Please watch the charging-LED in order to confirm the charging condition.
- It takes about 5 hours to complete full recharge, however, it might vary upon surrounding temperature and battery condition. Older Batteries might remarkably shorten both charging and operating time. Under unstable surroundings, such as high temperature or low temperature, Battery might not be properly recharged. Avoid sunlight and use the product at consistent temperature location.

Case that is not charging

- When temperature of battery is too high or too low (below 0°C/32°F or over 40°C/104°F).
- When Battery is not connected to the control box.
- When supplied voltage is not suitable (Refer to 'Error and Remedy')

3. Foot Controller Connection

: Please insert the foot controller plug into the foot controller connector exactly.



4. Angle Handpiece Connection

: Please insert the angle handpiece to motor until 'click' sound after arrange the angle handpiece positioning pin and motor positioning slot.

To separate the angle handpiece and motor, pull out the angle handpiece to its axis side.

5. File Connection

: Please insert the file into the chuck of angle handpiece until stop the file.

To separate the file and angle handpiece, pull out the file after pushing the button of angle handpiece head.





- Turn off the control box when insert or remove the file.
- Pull out the file to confirm locking it after connecting the file.
- Clean the chuck of angle handpiece at all times. The file can lose its balance or chucking power can be weakened if there is rust inside of the chuck.

OPERATION PROCESS

1. Turn on the control box by pressing the power button over the 1 second.
2. Select the program number by pressing the program button.
3. Save the program by pressing the memory button over the 1 second after setting the auto reverse mode, gear ratio, speed(RPM), torque. Ring the beep sound if the program is saving. (Function of each buttons refers to 'BUTTONS ON THE OPERATION PANEL'.)



- Press and hold the each setting button about gear ratio, speed and torque, value is set rapidly.
- Program is selected in reverse by pressing and holding the program button.
- Rotary direction is not saved in program. (Program is set to forward direction.)
- Press and hold the memory button until beep sound when save the program. Otherwise, program cannot be saved.

4. Set the rotary direction by pressing the operation direction button.
5. Motor is operated by pressing the motor button. Motor Button is  of control box and  of CUBE EP. Stop the motor operation by pressing the motor button once more. Motor operation can be controlled by pressing and releasing the foot controller.



- Foot Controller is ON/OFF switch. Intensity is not controlled.

ON/OFF Button



6. Place the handpiece on the motor stand, turn off the control box by pressing the power button over the 1 second after operating.



- Power is off with beep sound after 10 minutes without operation. However power is not off automatically during the motor operation even without use.

<Error and Remedy>

Error Display	Cause and Remedy
- L0 -	<ul style="list-style-type: none"> ◆ Low voltage of battery * Remedy: Charge the battery by connecting the adaptor.



- Wrong error will be displayed if you replace the battery while the adaptor is connected.



MAINTENANCE OF THE PRODUCT

1. Cleaning

■ Angle Handpiece

- ① Rotate the head in a tap water 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 angle handpiece to the motor.
- ③ Remove contaminants on the angle handpiece using a nylon brush after soaking for 20 minutes in Enzymatic Detergent.
- ④ Rinse the angle handpiece using the tap water for 3 minutes to remove Enzymatic Detergent.
- ⑤ Wash the angle handpiece for 10 minutes in the ultrasonic cleaner containing Enzymatic Detergent.
- ⑥ Rinse the angle handpiece for 3 minutes in the ultrasonic cleaner containing purified water repeatedly subjected 3 times. (Change the purified water each time.)
- ⑦ Wipe using dust-absorbent after the product soaked in alcohol(70%) for 30 seconds.

■ Motor

Wipe the surface of motor with alcohol swab or paper towel after removing the dirt.

* Pay attention to not enter the water into the motor.

2. Sterilization

Sterilization Product List

· Angle handpiece

Sterilization Method

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



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



- * Maximum sterilization number is 250 times.
- * Moist steam sterilization only. Otherwise the products might be damaged.
- * Make sure to use the sterilization bag and seal tightly..
- * Make sure to dry the applicable products before sterilization.
- * Sterilizing the angle handpiece with blood or other remains may cause the breakage of the angle handpiece. Therefore, it is necessary to clean the angle handpiece before sterilization
- * Irrigation tube and Y-tube are disposable. Do not re-use
- * Keep dry a connector and socket of the control box.
- * Before using, dry the product completely.

3. Lubrication

Lubrication Product List

- Angle handpiece

Lubrication Method

- Refer to the angle handpiece manual.



- Do not insert the oil into the motor. It damages the bearing or causes fever.

4. Battery Replacement

E-CUBE uses rechargeable battery. Battery is reused about 300 ~ 500 cycles, the span life may be different according to handpieces. Replace the battery when it shows shorter operation and recharging time and weak torque than set up. Be aware of 'Caution' for battery replacement. Manufacturer is not responsible for damage or breakage of the product caused by not following the instructions 'Caution' for changing battery.

Battery Replacement Method

- ① Remove the adaptor after turning off the control box.
- ② Remove the battery after open the battery cover of control box bottom to the marked direction.



- ③ Insert the replaceable battery to right direction.
- ④ Close the battery cover.
- ⑤ Charge the battery in order to use.



- Do not open except the battery cover.
- Use the recommended battery only. Otherwise, there are risks for the product damage, material leakage or explosion.
- Do not replace the battery by wet hands. In this case, there can be a short circuit or water penetration.
- Used and finished battery is recommended to be back to supplier. The product use battery which is composed of Nickel Metal Hydride, rechargeable, however, some countries stipulate it to be disposed as special waste.
- Unplug the adaptor to the control box. Otherwise, it may cause the product damage.

5. Troubleshooting

When trouble is found, check the following before contacting the manufacturer.

If none of these are applicable or the trouble is not remedied even after action has been taken, please contact the manufacturer.

1) Control Box & Adaptor

Problem	Cause	Remedy	
The power is not turned on.	The adaptor is not connected to the control box.	Check the connection.	
	The adaptor plug is not inserted into the adaptor connector exactly, or there is no electricity in the outlet.	Check the connection.	
	The battery is discharged.		Charge the battery.
			Use the adaptor.
	The battery is not inserted.		Charge the battery.
		Use the adaptor.	
The internal fuse is blown out.		Contact the manufacturer.	

Problem	Cause	Remedy
The adaptor-LED is not operated.	The adaptor is not connected to the control box.	Check the connection.
	The adaptor plug is not inserted into the adaptor connector exactly, or there is no electricity in the outlet.	Check the connection.
	The internal fuse is blown out.	Contact the manufacturer.
	The adaptor fuse is blown out.	Contact the manufacturer.
The adaptor is not operated. (The charging-LED is not operated.)	The battery is not inserted.	Insert the battery.
	The temperature of battery is low.	If the temperature of battery is less than 0°C(32°F), the battery is not recharged. Charge the battery in a warm room. (Be careful about moisture condensation.)
	The temperature of battery is high.	It is normal that the batteries become a little bit warm right after charging. If the batteries are hot under normal operating conditions, not right after charging, there may be an abnormality. Contact the manufacturer.
	The error is displayed.	Refer to the <Error and Remedy> in 'OPERATION PROCESS'.

2) Motor

Problem	Cause	Remedy
The handpiece does not rotate.	The motor cord is not connected to the control box.	Check the connection.
	Use the foot controller, without the connection.	Check the connection.
	The motor cord is broken or motor is malfunctioning.	Contact the manufacturer.
	The head of angle handpiece is clogged.	Clean the angle handpiece.
Display the "---" and setting torque alternately at the torque display part. (Case that the function is selected for returning the forward rotation after automatic reverse.)	The head of angle handpiece is clogged.	Clean or replace the angle handpiece.
	The motor cord is broken or motor is malfunctioning.	Contact the manufacturer.



ATTENTION

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

- 1) Check the connection of every cords and correct operation when power-on.
- 2) Check the earth connection is safe.
- 3) Make sure to check the contact part to patient.
- 4) If not use the adaptor, check the charging volume of battery.
- 5) Check the sterile condition of autoclavable parts.

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

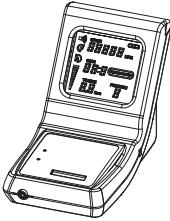
- 1) Check the status of product and patient constantly during the surgery.
- 2) When product or patient has any problem, stop the operation in condition of patient's safety or take proper action.
- 3) Do not let patient to approach the product.

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

- 1) Do not put any physical pressure on the adaptor cord, motor cord and foot controller cord.

● PRODUCT SPECIFICATION

1. Control Box

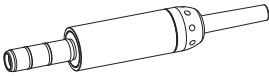


Model Name	E-CUBE
Input	DC 20 V, 1.5 A
Output	DC 6 V (Max)
Charging Time	Approx. 5 hours

2. Motor



Model Name	CUBE EP
Rated Input	DC 6 V (0~6 V)
Max. RPM	13,000rpm



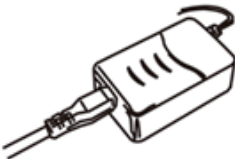
Model Name	CUBE EM
Rated Input	DC 6 V (0~6 V)
Max. RPM	13,000rpm

3. Foot Controller



Model Name	ON/OFF SWITCH
Classification according to the degree of protection against ingress of water (IEC 60529)	IPX 1

4. Adaptor



Input	100-240V~, 47-63Hz, 0.9-0.34A
Output	DC 20 V, 1.5 A (Max)

ELECTROMAGNETIC COMPATIBILITY INFORMATION

In IEC/EN 60601-1-2:2007. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generate, use 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 between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or filed service technician for help.


(1) Electromagnetic Emissions

Emission test	Compliance	Electromagnetic environment - guide
RF emission – CISPR 11 EN 55011	Group 1	E-CUBE uses RF energy for internal operation. Therefore, its radiofrequency emissions are very low and are not likely to cause any interference in nearby equipment.
RF emission – CISPR 11 EN 55011	Class A	E-CUBE is suitable to 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 emission – IEC 61000-3-2 EN 61000-3-2	Class A	
Voltage fluctuations Flicker emission – IEC 61000-3-3 EN 61000-3-3	Compliance	

(2) Electromagnetic Immunity

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2 EN 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV 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	Mains 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	Mains 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	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 6 cycles 70% UT (30% dip in UT) for 30 cycles <5% UT (>95% dip in UT) for 5s	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 6 cycles 70% UT (30% dip in UT) for 30 cycles <5% UT (>95% dip in UT) for 5s	Mains power quality should be that of a typical commercial or hospital environment. If the user requires continued operation during power mains interruptions, it is recommended that the E-CUBE got power from an uninterruptible power supply or battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8 EN 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

(3) ELECTROMAGNETIC IMMUNITY / RADIOFREQUENCY MOBILE EQUIPMENT

Emission test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6 EN 61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the E-CUBE including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3 EN 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m	<p>Recommended separation distance $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$ 80MHz to 800MHz $d = 2.3 \sqrt{P}$ 800MHz to 2.5GHz</p> <p>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 (m).</p> <p>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).</p> <p>Interference may occur near equipment marked with the symbol below: </p>

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. 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.

Cables and accessories	Maximum length	Shield	Complies with	
Micro motor with motor cord	1.2M	Unshielded	RF emissions, CISPR11	Class A / Group 1
			Harmonic emissions	IEC 61000-3-2 EN 61000-3-2
Foot controller with cord	1.2M	Unshielded	Voltage fluctuations / flicker emissions	IEC 61000-3-3 EN 61000-3-3
AC power cord	1.5M	Unshielded	Electrostatic discharge (ESD)	IEC 61000-4-2 EN 610000-4-2
			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	



WARRANTY

SAESHIN guarantees out product for 1 year from invoice date, and product warranty means that SAESHIN has responsibility of 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 rotator. To check the warranty requires the operating condition, environment information, serial number of the product and stamped invoice. The warranty will be performed as repairs or exchanges by manufacturer's judgement and analysis of product.

Exception of warranty

User's misuse or improper use and treatment

Use the product with incorrect input voltage (AC voltage)

Drop the device during setting, moving, using

Use the not recommended consumables or accessories

Malfunction after repairing the product at the not recommended repair shop

Normal wear of the consumables such as ball bearing, gear, chuck, spindle case assy, rotator etc.

Faulty by Act of God



























Foreign Language Manual Support

This manual is basically offered in Korean and English. But, if other countries need manual with their own language, we can offer the manual with relevant language.

- 1) The translated draft manual will be supplied by manufacturer on demand.
- 2) We will send the translated draft manual with English version to the import company to check it.
- 3) After we get the feedback from the import company, we will offer the completed manual.

Operating 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

SYMBOL

	Power Button		Motor Button
	Auto Reverse Button		Operation Direction Button
	Gear Ratio Button		Charging-LED
	Adaptor-LED		Speed Button
	Torque Button		Program Button
	Memory Button		Consult Instruction for Use
	Manufacturer		General Caution Sign
	EC Representative		General Warning Sign
	Serial Number		General Prohibition Sign
	Autoclave		Foot Controller
	Type B		CE Marking
	This product should not be mixed with other commercial waste for disposal.		Fuse
	Non sterile		Alternating Current



MEMO



MEMO



SAESHIN

This product is the medical device.



CE
1639



Made in Korea

SAESHIN

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