ZERONE Electrosurgical Unit

CE
2460

ZEUS VISION

OPERATION MANUAL

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ZERONE CO., LTD.

(E)

ZEUS VISION Operating manual

ZERONE CO., LTD

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1. Introduction

1.1 Prior Notice

● How to Contact Us

- Contact us on the following telephone numbers and address in order to receive our service and products.

For Supplying Products and Ordering Supplies	ZERONE Co., Ltd. (Shinil IT UTO Bldg., Dangjeong-dong) 8F, LS-ro 13, Gunpo-si, Gyeonggi-do, 15843, Republic of Korea Tel : + 82 31 427 2772 Fax : + 82 31 427 2332
For Repair Service	Tel : + 82 31 427 2772
Technical Assistance	For technical inquiries, contact us with the following telephone number. Tel : + 82 31 427 2772
Homepage	URL : http://www.01zeus.com
EUR REPRESENTATIVE EC REP	CMC Medical Devices & Drugs S.L. C/ Horacio Lengo Nº 18, CP 29006, Málaga, Spain Tel/Fax : + 34-661-416-622

※ If any faults or malfunctions, contact us, providing the model and serial number of the damaged product.

● Warranty Period

- This product was made under the strict quality control system and inspections.
- The warranty period is one year.
- Compensation standard for repairs and replacement complies for “Guidelines for Consumer Protection” quoted by the Korean Economic Planning Board.
- If the product fails to operate during this period, our service center will provide free repair service to you.
- The manufacturer or agency does not take responsibility for any breakages or damages if malfunctions are caused by customer's improper use or careless treatment.

● Warning, Caution, Notice

This manual adopts several terms to draw your attention to what must be informed of or aware of. Please read carefully and be fully aware of them before you start operating the equipment.

Warning 

Serious physical injury. death or property damage might occur to patients if this not observed.

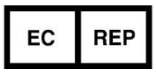
Caution 

Slight physical injury (not causing death) might occur if this is not observed.

Notice 

Something important. not dangerous that might occur when users install. use and maintain the equipment.

● Signs

No	Symbol	Description
1		Type CF Applied Part
2		RF Isolated : Count electrode isolated to an earth for high frequency
3		Refer to the manual
4		Non-ionizing Radiation : This equipment intentionally supplies non-ionizing RF energy for physiological effect.
5		High Voltage Warning
6		Caution
7		Potential Equalization conductor
8		Protective Earth
9		EU Representatives information
10		Manufacturer information
11		Made date
12		Serial number
13		Electronics Disposal Information
14		Do not re-use
15		Keep dry
16		Keep away from sunlight

● Cautions

- Do not use/store this equipment under the following environments.

	Wet hands or humid areas.		Direct rays.
	Out of these temperature and humidity ranges: T:10℃ ~ 40℃, H: 20%~ 95%.		Near to electronic heaters.
	Areas with high humidity or ill ventilation.		Excessive shock or vibration.
	Areas contaminated chemical materials or leaked gas.		Dust or metals that could be stuck.
	Taking to pieces. in this case, this company would not take any responsibility		Plugging the installation uncompleted. In this case, the equipment can be damaged.

2. Installation Notice

This operating manual describes the function and handling of the Radio Frequency Surgery Equipment ZEUS VISION. The manual serves as an instruction reference and should be read thoroughly before operating the equipment. Only then can the correct handling of the equipment be assured. In case of incorrect handling no liability will be taken on by the manufacturer

2.1 Before Application

Warning ⚠

If any malfunction or breakage. do not use it for patients and instead contact with medical equipment technicians or suppliers.

● About Accessories

Warning ⚠

Check the followings before using this product.

① Electric Shock
Don't connect wet accessories to the surgical unit; precisely connect all accessories to adapters; don't expose metal materials to the air.

② Check the linkage condition between all accessories and Electrosurgical Unit before using them. If the connection is bad, it can cause unintentional operation effects like spark or accessory malfunction.

③ Don't wrap up the accessory code or Patient Return Plate in metal materials.
This can generate shock and fire, inflicting an injury on patients or operators.

④ Before using accessories, always check if reusable accessories and codes are not broken, cracked, scratched, etc. If this is not done, patients or operators can be injured or struck by electricity.

⑤ Connect accessories to the appropriate sockets because bad connection can cause dangerous situations. Unused accessories (active electrode) must not be placed on the patient body.

⑥ ZERPNE Co., Ltd. Supplied accessories have appropriate for rating for ZEUS VISION. CE marked or UL approved components with more than Monopolar: 3000Vpp, Bipolar: 1000Vpp Rated voltage rating can be used as accessories. If the rating of the accessory is lower than the max output of the applicable mode,
set up the output as much as the rating of the applicable accessory.
Safety hazard may occur if products with lower quality are utilized.

⑦ Connect Bipolar accessories to corresponding Bipolar sockets.

Caution ⚠

Check the followings before using this product.

① Don't throw away disposable accessories in a certain area where problems may occur. Keep in mind the environmental problem at any time and place.

② Use the “Disposable” accessories once. Don't use/sterilize them again.
When reusing, it may cause the equipment malfunction or unintended operation effect to injure doctors or patients.

③ Before operation, check all the accessories to see if they are sterilized. After operation, sterilize all reusable accessories and then store them.
Make sure the effective date is valid for the “Disposable” accessories prior to their use.

④ When disposing of this electrosurgical unit, or any of its components (such as fuses), follow all applicable national and local laws and guidelines.

⑤ This electrosurgical unit should be recycled separately from household waste.
When this product reaches its end of life, follow the local laws and regulations of Disposal. The improper disposal of waste electronic equipment from consumer may be subject to fines.

⑥ For more information on repair, please refer to the service manual.

● Patient Return Plate

Warning ⚠

Check the followings before using this product.

It is recommended that Patient Return Plate be applied to REM system of ZERONE Co., Ltd. Monitors the size of contact area between a patient and the pad. If the size is inappropriate, it automatically blocks the high-frequency current to minimize the danger of burning incidents.

① Do not apply Patient Return Plate to Bipolar-only operation.
Otherwise, the effects of Electrosurgical Unit cannot be limited to the organization between Bipolar electrodes.

② Don't cut Patient Return Plate in half, which can make a patient burned.

● Electrical Safety

Caution ⚠

Check the followings before using this product.

① Warning : To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth

② Use the power code provided by the equipment supplier or a other test-completed product that has equal quality.

③ Don't use a extended code that has no ground connection.

④ Connection for potential equalization : Connection pins for potential equalization cable between RF equipment and potential equalization bar in or room. The yellow-green potential equalization cable supplied by the manufacturer must be used.

Warning ⚠

Check the followings before using this product.

① Don't place any equipment on Electrosurgical Unit, which can prevent this unit from being cooled.

② Don't reduce the volume of display indication sound, which provides alarms to the operator during an operation of the surgical unit.

③ When using Smoke Evacuator connecting Electrosurgical Unit, keep them apart each other, and set up the output sound at the maximum level so that the output sound and the alarm indication sound can be heard well.

④ Electrosurgical Unit should be kept apart, as much as possible, from other electronic equipment because the use of the unit can have negative effects on other medical units that are using other electricity.

⑤ Check the linkage condition of equipment ground.

⑥ Impressed voltage (AC120V/AC230V) should be used in accordance with the rating. Before providing power, check an operation voltage and power frequency marked in the label on the back of the product. Inappropriate power could cause output fluctuation and a direct fault in the product. To prevent over-standard voltage fluctuation, it is recommended that Automatic Voltage Regulator (AVR) be used.

3. Application Notice

Electrosurgical Unit is supposed to generate high voltage and current for its application. To avoid exposing a patient, an operator and the third parties into a dangerous situation, operation should be carefully conducted, and safety rules should be strictly kept.

● About Patients

Warning ⚠

Check the followings before using this product.

① Eliminate or isolate all the patient's metal materials and handle them with special interests.

② A patient must be isolated from grounded metal materials. Be careful to see if they are contacted to the patient. The isolation status must be maintained even if a patient who is going through an operation is moved into other positions.

③ Do avoid skin-to-skin contact, including fingers touching legs.
Place dry gauze on patient's skin where possibilities of skin-to-skin contact is high, to avoid any skin burn.

④ Unused accessories should be stored in untouchable, electricity-isolated and conspicuous areas. Hot accessories just used can lead to a fire. Do not place them near to the inflammable materials.

⑤ Check if the output level of Electrosurgical Unit was arranged to the appropriate level for an operation. It is recommended that the output power be lowered as soon as possible, so that a user can expect possible problems generated from inappropriate location or connection of Patient Return Plate during ordinary output, and then slowly increase the output power.

⑥ Minimize the possibility of burning incidents by using Active Electrode for the time only required for wanted operation effects. In particular, apply this method to operations for such patients as infants, newborns and, those who are in small auxiliary institutes.

⑦ Avoid the use of inflammable anesthetics like N_2O and O_2. Electrosurgical Unit using high frequency can generate a flame at an always-operating electrode by contacting the anesthetics. Therefore, the materials should be completely evaporated for cleanliness and sterilization before using the unit. Naturally generated gases accumulated in intestines, the deep navel or vagina in human body can be also inflammable so that these liquefied gases must be eliminated before using the unit. After sterilizing the body with the dangerous anesthetics, it is necessary to ventilate them since the gases are likely to explode.

⑧ Neuromuscular can be stimulated. The stimulus can occur when low frequency current is generated from the supplier of low-frequency current or electrical arc located between the electrode and patient's organization. A spasm or muscular clamp is likely to be generated while arc is created during Cutting or Coagulation (contact/ spray) is somewhat rectifying high-frequency current.

⑨ Extreme caution must be taken for patients with pacemaker or implantable electrode. Performance of devices may be temporarily affected which may cause ventricular fibrillation. In case of any doubts concerning safety of patient contact qualified and concerned pacemaker manufacturer or Cardiology department.

⑩ Do not use Active Electrode near to Electrocardiograph electrode. ESU electrode must be kept apart at least 150mm from ECG electrode. It is necessary to use Monitoring Electrode with protective resistors to survive high frequency.
Do not use a needle-typed electrode.

⑪ Most sweated parts of human body (armpit, knee, skin-to-skin parts) can be burned when Patient Return Plate or other materials contacts with those parts, therefore, some dried and absorbable towels should be used to dry them.

⑫ Lower output or performance of electrical surgical device despite correct surgical setting may be caused due to incorrectly applied patient plate or bad connection. In this case, before setting a higher output, you must check the connection status.

⑬ Make sure that the parts that make up the active electrode of the papillotomy do not Touch other metallic instruments, particularly not the edge of the endoscope (papillotomy exits from the endoscope's working channel).
Localized burns to the patient or physician may result from electrical currents carried through conductive objects. Electrical current may be generated in conductive objects by direct contact with the active electrode, or by the active accessory(electrode or cable) being in close proximity to toe conductive object.

⑭ The output from electrodes may change during use.

⑮ A failure of the Electrosurgical Unit could result in an unintended increase of output power.

Caution ⚠

Check the followings before using this product.

① The patient leads should be positioned in such a way that contact with the patient or other leads is avoided. Temporarily unused electrodes should be stored in a location that is isolated from the patient.

② For surgical procedures where the HF current could flow through parts of the body having a relatively small cross sectional area, the use of BIPOLAR techniques may be desirable in order to avoid unwanted tissue damage

● About Patient Return Plate

Warning ⚠

Check the followings before using this product.

① Plat Electrode should be near to an operation part of human body and adhere closely to the patient's body. Periodically check if the electrode firmly contacts to the body when moving the patient or performing a long operation.

② Contact Plate Electrode closely to the place whose direction is the opposite from the heart based on the operated part.

③ If Patient Plate is not closely adherent to the patient body, he/she can get a burn sine high frequency current flows between Dispersive Electrode and the skin.
When using Patient Plate, you should bind it by something like band, after putting gel ('Use a gel for medical.') all over the patient skin on which Patient Plate will be adhered in order it to be adhered to the patient skin completely.

Caution ⚠

Check the followings before using this product.

① Don't use Plate Electrode on implant, metal material, protruding bones and scars. Clean skin required for operation and eliminate the oil and hair on it.

② Make a short cut of the current path between Active Electrode and Dispersive.

4. Follow-Up Ways for Storage and Maintenance

- When removing a series of codes, don't unplug them at a time.
- Don't screw, bind or stack the cables.
- After performing an operation, sterilize all accessories and then store them.
- Turn off the power after using equipment and remove the power plug and store it when leaving the office or not using for a long time.

① About Cleaning

- Clean the main unit and foot switch with soft fabric which is wet with warm water or alcohol at least once a month. If you use the material is designated cleaning, you have to ask chemical manufacturer regarding effect of microbe.
  Clean its external appearance with non-ignitable, non-explosive materials.
  Don't use corrosive, easily-grinding materials that can damage it such as lacquer, thinner, ethylene and oxidizing agents, etc. Don't let the liquid into equipment.

- You should use 70% isopropyl alcohol or ethyl alcohol when you clean accessories.

② About Sterilization

- The accessory listed below must be used after sterilization.

Accessory	Sterilization
	Auto Clave
Reusable Bipolar Forceps	- Gravity Displacement (121℃(250°F)) : 30minutes - Drying time : 20 minutes
Reusable Electrodes Tips	
Reusable Monopolar Handle	- Gravity Displacement (121℃(250°F)) : 20minutes - Drying time : 20 minutes

Warning ⚠

Check the followings before using this product.

① During sterilization, don't increase temperature and pressure more than the standard, which can cause damage to the accessories.

② Don't sterilize disposable accessories.

5. Configuration

5.1 Feature

① This equipment consists of 7 inch of TFT LCD and 5 functional keys which are placed in the front part.

② With the adoption of touch screen, it is easy to select menu, operation functions and RF output.

③ Menu and operation functions can be selected by Menu Button, Esc Button, Enter Button, Up Button and Down Button.

④ The ON/OFF function of Touch Screen is provided.

⑤ 2 Twin button handles provides convenience during surgery.

⑥ Auto Start Bipolar is operated just with the touch of Forceps.

⑦ The use of microprocessor ensures the linear property and stability of output.

⑧ The input power frequency 50Hz / 60Hz is automatically detected.

⑨ 99 storages are available by using user storage function.

⑩ As the operation sounds of each use mode (Cutting, Coagulation, Bipolar Cutting and Coagulation) are different, the use of each operation can be distinguished just with sound.

⑪ For the operation of button and touch screen, operation sound are made.

⑫ The loudness of alarm in use mode can be controlled.

5.2 Safety Function

① A fuse built in a power circuit prevent an over current from flowing through the equipment.

② When the plate attached to the patient is separated from the equipment, the red alarm light begins flickering. Pressing the button of Twin Button Handle or the pedal of Cutting and Coagulation of Double Foot Switch will stop the alarm sound and the equipment.

③ REM (Return Electrode Monitoring) monitors the size of contacting area between a patient and the pad. If the size is inappropriate, it automatically blocks the high-frequency current to minimize the danger of burning incidents.

④ To protect a patient, the case is fully grounded so that a leakage current can flow into the earth.

5.3 Indication for use

Electrosurgical unit is a device to perform a medical operation like Cut and Coagulation in the biological tissue using high-frequency current

● Operator Profile

Considerations		Requirement description
Education	Minimum	A physician or medical personnel under the supervision of a physician
	Maximum	N/A
Language understanding	Minimum	Languages specified in the instruction for use
	Maximum	N/A
Experience	Minimum	A person who received sufficient training in electrosurgical procedures
	Maximum	N/A
Permissible impairments	N/A	

● Intended Patient Population

Considerations	Requirement description
Age	No limitation
Weight	Check a marking in kg indicating the maximum a patient weight on end use packaging for Disposable Patient Return Plate
Healthy	Except for patients who get an implantable pacemakers or implantable defibrillators transplant.
Nationality	No limitation
PATIENT state	A patient is not user : not relevant, unless patient is agitated

5.4 Configuration and Accessories

● Configuration

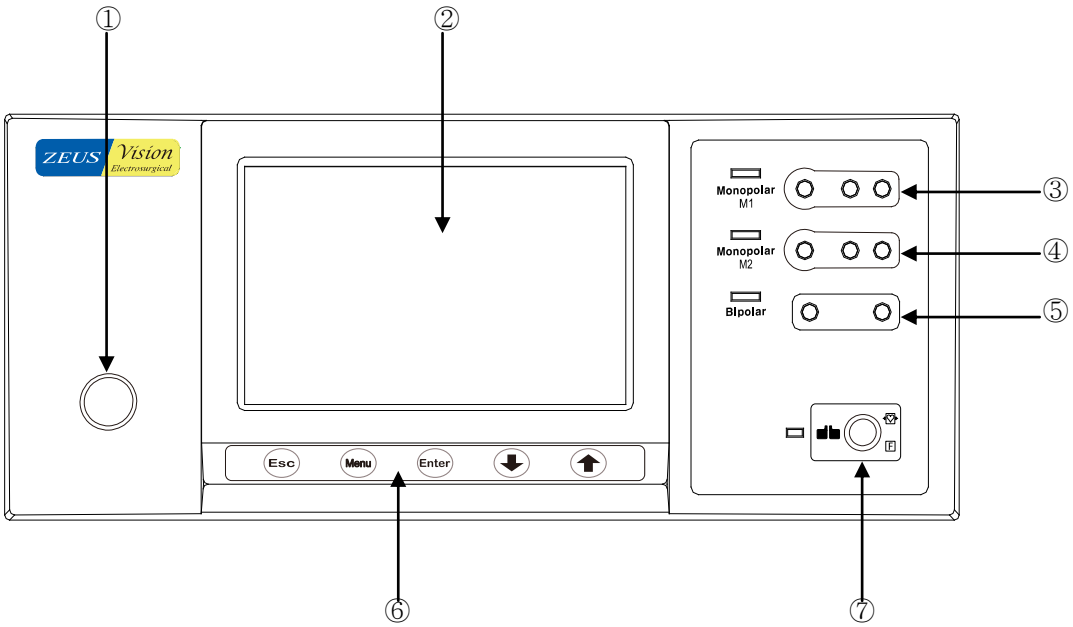
① Electrosurgical Unit 1EA
② Double Foot Switch 1EA
③ Single Foot Switch 1EA
④ Disposable Twin Button Handle 1EA
⑤ Reusable Monopolar Handle 1EA
⑥ Reusable Patient Return Plate Cable 1EA
⑦ Bipolar Cable 1EA
⑧ Disposable Patient Return Plate 5EA
⑨ Monopolar Connecting Cable 1EA
⑩ Power Cord 1EA
⑪ Bipolar Forceps 1EA
⑫ Knife Electrode 2.4*70mm 1EA
⑬ Needle Electrode2.4*70mm 1EA
⑭ Needle Electrode (Angled) 2.4*70mm 1EA
⑮ Ball Electrode 5mm 1EA
⑯ Ground Cable 1EA

● Accessories (Optional Products)

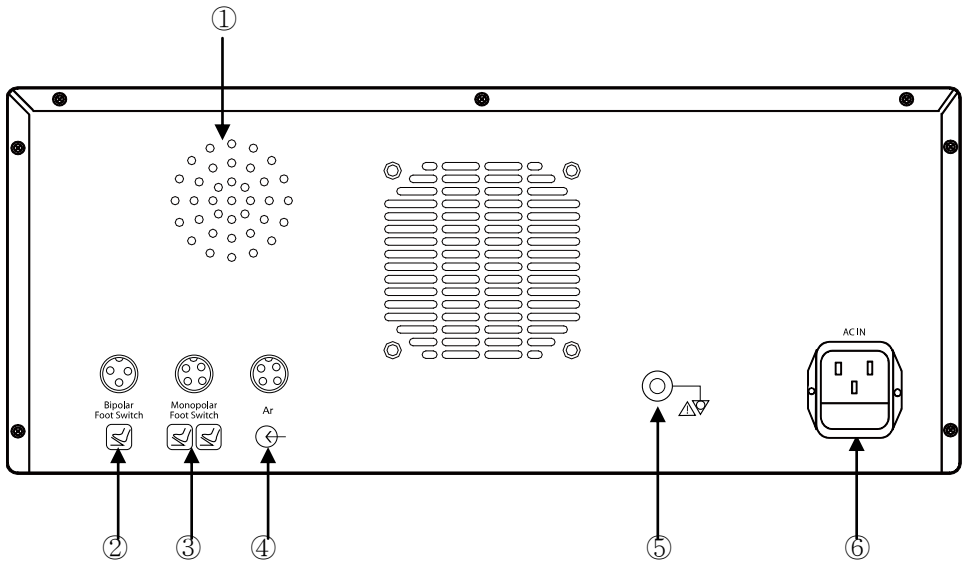
① Loop Electrode 6mm
② Reusable Silicone Patient Plate

5.5 Name and Function of Each Part

● Front Side



● Back Side



● Front Side

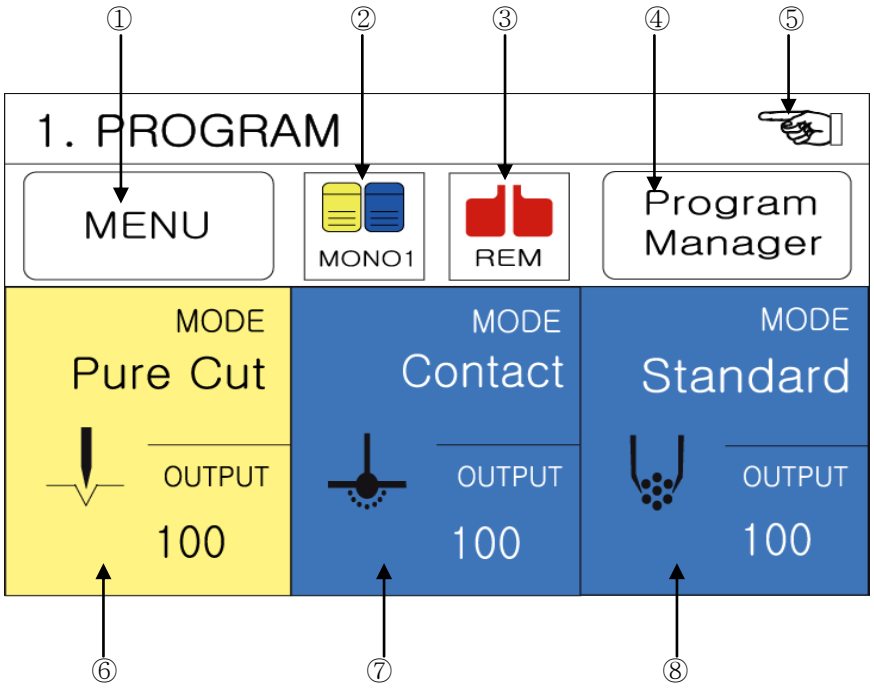
① Power ON / OFF Switch
② LCD Display
Screen to display the use of LCD Touch Screen and the operation states of equipment.
③ Cutting and Coagulation electrodes connection port 1 -Applied part
Connection ports for Twin Button Handle and Monopolar (M1) Handle
④ Cutting and Coagulation electrodes connection port 2 -Applied part
Connection ports for Twin Button Handle and Monopolar (M2) Handle
⑤ Bipolar forceps connection part -Applied part
Connection ports for bipolar forceps
⑥ Setting of Control Keys
ⓐ ESC Button: to move to the previous menu.
ⓑ Menu Button: to select menus like Brightness, System Vol. Key Vol. etc.
ⓒ Enter Button: to confirm and perform the selected menu.
ⓓ Decrease Selection Button: to lower output and to move menu
ⓔ Increase Selection Button: to increase output and to move menu

⑦ Connection to Patient Plate-Applied part
By monitoring the electric connection states of Patient Plate electrode and the main boy and the attachment status to the patient, it issues alarm sounds and displays LED in red if the status are not normal.

● Back Side

① Speaker
The speaker generating alarms during the operation of electrosurgical unit.
② Bipolar Coagulation foot switch connection part
Single foot connection port in the operation of bipolar coagulation foot switch mode.
③ Cutting and Coagulation foot switch connection part
Double foot switch connection port in the operation of Cutting and Coagulation in using monopolar handle.
④ Foot Switch Signal Cable connection part
Foot switch signal cable connection part of the 4 pin connector.
⑤ Ground connection part
Earth ground connection port in using grounding cable.
⑥ Main power connection part
Connection of main power code.

● LCD Display



① Menu
This part displays the function to select and control Brightness, Key Vol., and System Vol.

② Monopolar Output Selector Mode
When using double foot, they are output to Mono1 and Mono2.

③ REM
When using Patient Return Cable, disconnection is displayed in red and connection is displayed in green.

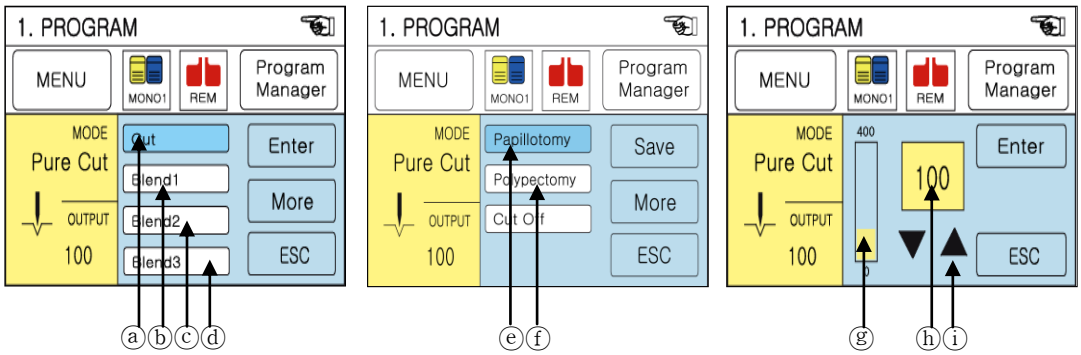
④ Program Management
It displays storage function (Load, Save, Save as., Delete).

⑤ Touch Hold Function
It displays Touch ON/OFF of touch use.

Notice ⚠

To select Touch OFF, use the control keys to select and set functions.

⑥ Cut Mode



ⓐ Pure Cut Mode

Select this mode to cut in the lowest level of hemostasis.

ⓑ Coagulation Blend1 Mode

Select this mode to cut in the minimum hemostasis.

ⓒ Coagulation Blend2 Mode

Select this mode to cut in the middle level of hesmostasis.

ⓓ Coagulation Blend3 Mode

Select this mode to cut in the maximum level of hesmostasis.

ⓔ Papillatomy Mode

Select this mode if you need to incise with mixed effect using cut and coagulation.

ⓕ Polypectomy Mode

Select this mode if you need to remove without bleeding repeating cut and coagulation.

ⓖ Decrease and Increase of Output

Touch the output bar mark on the LCD screen to lower and increase the output.

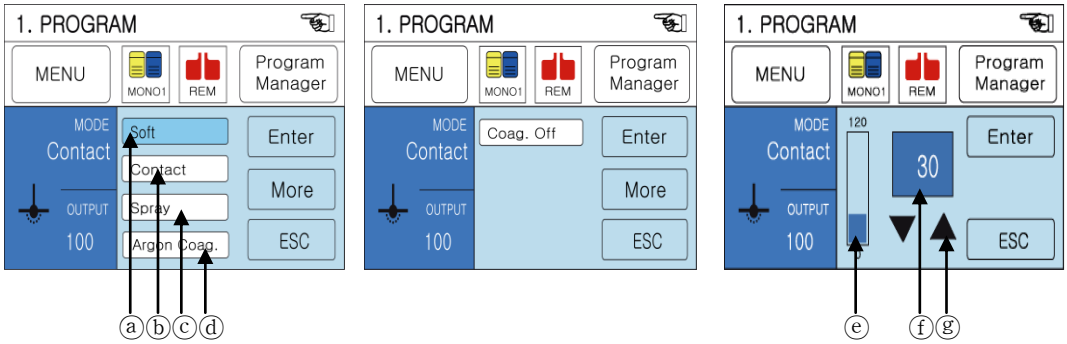
ⓗ Output Display

It displays output in the unit of wattage.

ⓘ Decrease and Increase of Output

Use the decrease mark(▼) and increase mark(▲) on the LCD screen to lower and increase output. One time touch makes decrease and increase of output by 1 W. One time press on the decrease mark(▼) and increase mark(▲) of the control key makes decrease and increase of output by 1W. Press it for more than 5 seconds, the output (W) increase and decrease rapidly.

⑦ Coagulation mode



ⓐ Soft Mode

Select this mode if you need coagulation on a soft and narrow area.

ⓑ Contact Mode

Contact directly and select this mode if you need general coagulation.

ⓒ Spray Mode

Select this mode if you need coagulation on wide area quickly.

ⓓ Argon Coagulation Mode

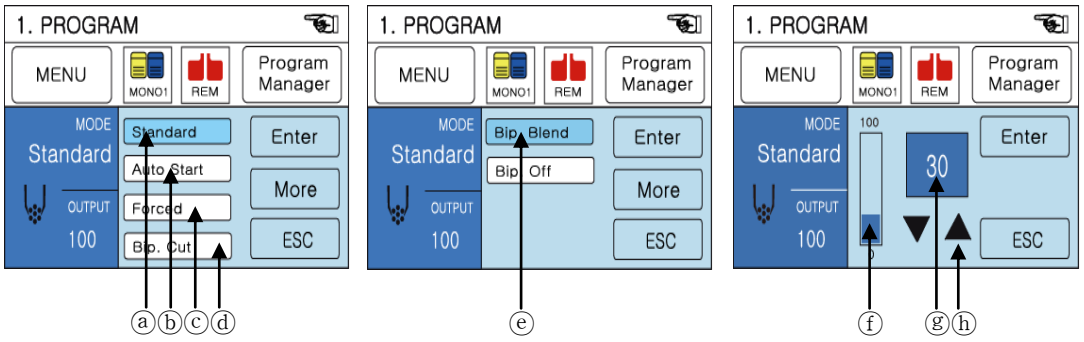
Select this mode if you need to coagulate using argon gas.

ⓔ Decrease and Increase of Output
Touch the output bar mark on the LCD screen to lower and increase the output.

ⓕ Output Display
It displays output in the unit of wattage.

ⓖ Decrease and Increase of Output
Use the decrease mark(▼) and increase mark(▲) on the LCD screen to lower and increase output. One time touch makes decrease and increase of output by 1 W. One time press on the decrease mark(▼) and increase mark(▲) of the control key makes decrease and increase of output by 1W. Press it for more than 5 seconds, the output (W) increase and decrease rapidly.

⑧ Bipolar mode



ⓐ Standard Mode

You can use the Single Foot Switch to do bipolar coagulation using the general Forceps.

ⓑ Auto Start Mode

By using Forceps, bipolar hemostasis can be operated without using Foot Switch.

ⓒ Forced Mode

You can use the Single Foot Switch to select stronger and quicker bipolar coagulation than standard mode.

ⓓ Bipolar Cut Mode

By using Single Foot Switch, bipolar cut can be operated in low hemostasis.

ⓔ Bipolar Blend Mode

By using Single Foot Switch, bipolar blend cut can be operated in minimum hemostasis.

ⓕ Decrease and Increase of Output

Touch the output bar mark on the LCD screen to lower and increase the output.

ⓖ Output Display

It displays output in the unit of wattage.

ⓗ Decrease and Increase of Output

Use the decrease mark(▼) and increase mark(▲) on the LCD screen to lower and increase output. One time touch makes decrease and increase of output by 1 W. One time press on the decrease mark(▼) and increase mark(▲) of the control key makes decrease and increase of output by 1W. Press it for more than 5 seconds, the output (W) increase and decrease rapidly.

● Accessories

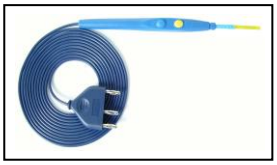
① Double Foot Switch

Connect it to 4pin connector on the back side of the product.
The yellow pedal is for Cutting and the blue one
is for Coagulation.
4pin plug, Cable 4m

② Single Foot Switch

Connect it to 3pin connector on the back side of the product during an operation of Bipolar function.
3pin plug, Cable 4m

③ Disposable Twin Button Handle

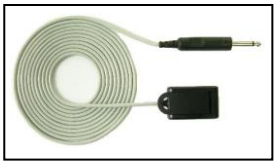


Connect it to the terminal of connection 1,2 for Cutting and Coagulation Electrode. The yellow key operation is for Cutting and the blue is for Coagulation.
3pin Plug, Cable 3m, Rated Voltage (Umax):3000Vpp
Expiration date of Disposable Twin Button Handle: Check the packaging for Disposable Twin Button Handle

④ Reusable Monopolar Handle

Connect it to the terminal of connection 1, 2 for Cutting and Coagulation Electrode. The yellow pedal is for Cutting and the blue is for Coagulation.
Cable 3m, Rated Voltage (Umax):3000Vpp

⑤ Reusable Patient Return Plate Cable



Connect it to the connection part of Patient Plate.
Connect Patient Return Plate to Clamp.
Cable 3m, Rated Voltage (Umax):3000Vpp

⑥ Bipolar Cable

Use it to link the connection for Bipolar Forceps with Bipolar Forceps.
2pin Plug, Cable 3m, Rated Voltage(Umax):1000Vpp

⑦ Disposable Patient Return Plate

Connect it to the clamp of Patient Return Plate Cable.
180 * 120mm
Expiration date of Disposable Patient Return Plate: Check the packaging for Disposable Patient Return Plate

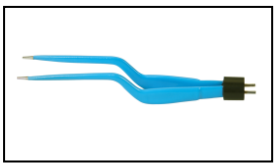
⑧ Power Cord

Connect it to Main Power connection on the back side of the product.
Cable 1.8m

⑨ Monopolar Connecting Cable 3Ø

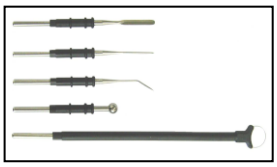
Connect it to the terminal of connection1, 2 for Cutting and Coagulation Electrode.
Cable 4m, Rated Voltage (Umax):3000Vpp

⑩ Bipolar Forceps



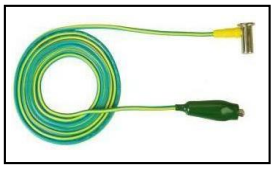
Connect it to the connection terminal of Bipolar Cable.
Use it during Bipolar Coagulation.
Bayonet Forceps, 17.8cm, Tip 1mm
Rated Voltage (Umax):1000Vpp

⑪ Electrodes



Use it during Cutting and Coagulation
Knife Electrode 2.4 * 70mm
Needle Electrode 2.4 * 70mm
Needle Electrode (Angled) 2.4 * 70mm
Ball Electrode 5mm
Loop Electrode 6mm

⑫ Ground Cable



Connect the cable to compensate for potential
Cable 2m

● Accessories (Optional Products)

①Reusable Silicone Patient Plate

Connect it to the connection part of Patient Plate.
240*150mm, Cable 3m
Rated Voltage (Umax):3000Vpp

5.6 Using Method and Procedure

● Monopolar

① After confirming power and voltage (AC120V/AC230V), connect a ground power cable to the power connection part on the back side of Electrosurgical Unit. If there is no ground at Main Power, link an earth ground to the ground connection on the back side of the product.

② Turn on the power switch.
Check if the initial LCD screen is displayed and if the REM alarm lamp is flicking.

③ Connect the Patient Return Plate Cable to the Patient Plate connection port of the surgery unit.

- Double Patient Return Plate
  Connect the Double Patient Return Plate to the Patient Return Plate Cable Clamp connection port.
  Attach pad to the patient's body. Alarm lamp stops and it is ready to use.

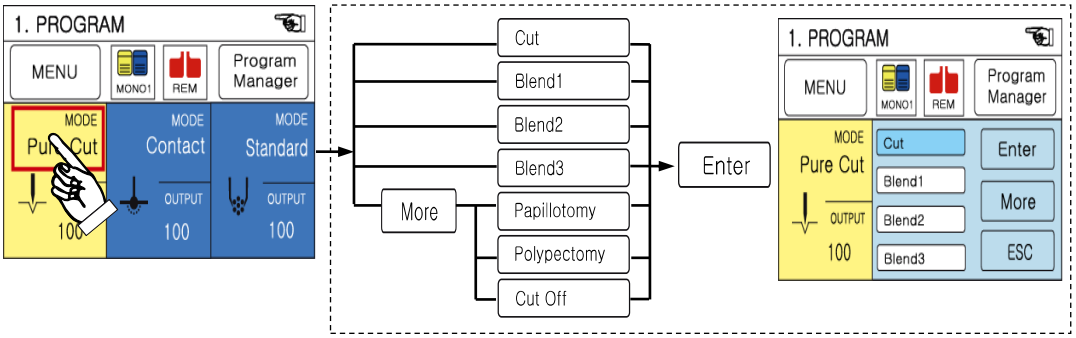
- Single Patient Plate
  Connect the Single Patient Plate to the Patient Return Plate Cable Clamp connection port.
  Alarm lamp stops and it is ready to use. Attach pad to the patient's body.

Notice ⚠

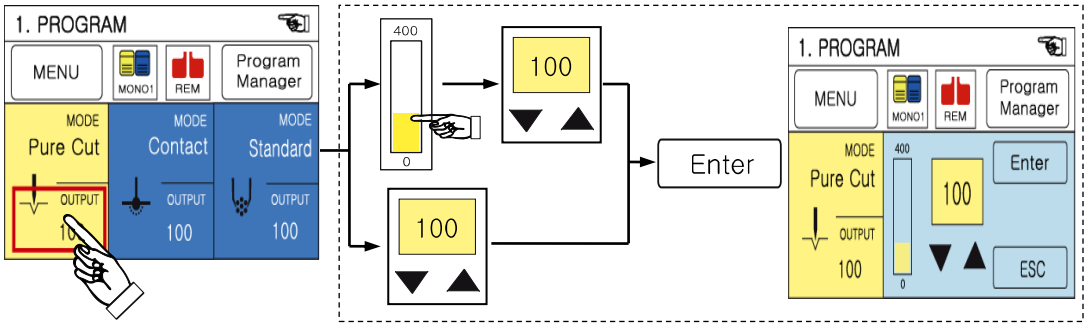
It is recommended to set each mode and output before surgery and to use the equipment with touch off.

④ Select cut mode (Cut, Blend1, Blend2, Blend3, Papillotomy, Polypectomy) and select desired output (W) by using the decrease mark (▼) and increase mark (▲).
Papillotomy and Polypectomy can control the interval of cut and coagulation.

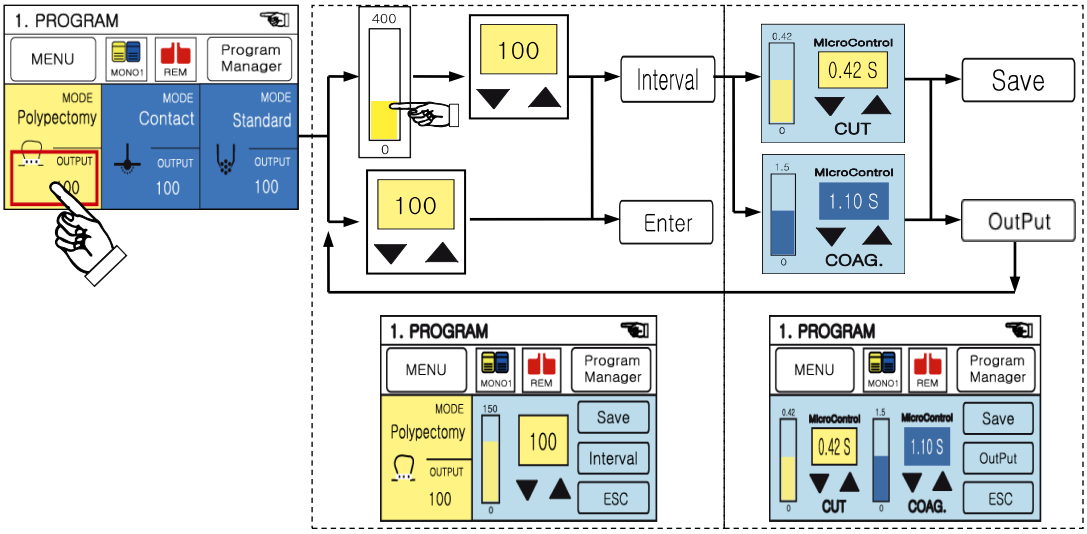
ⓐ Select cut mode



ⓑ Select cut mode(Cut, Blend1, Blend2, Blend3) output(W)

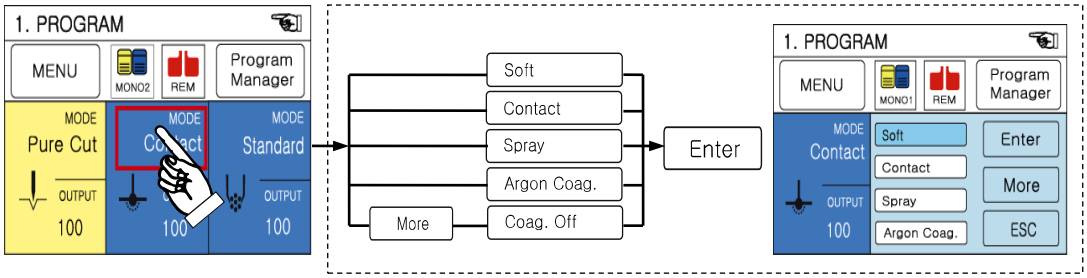


ⓒ Select cut mode(Papillotomy, Polypectomy) output(W)

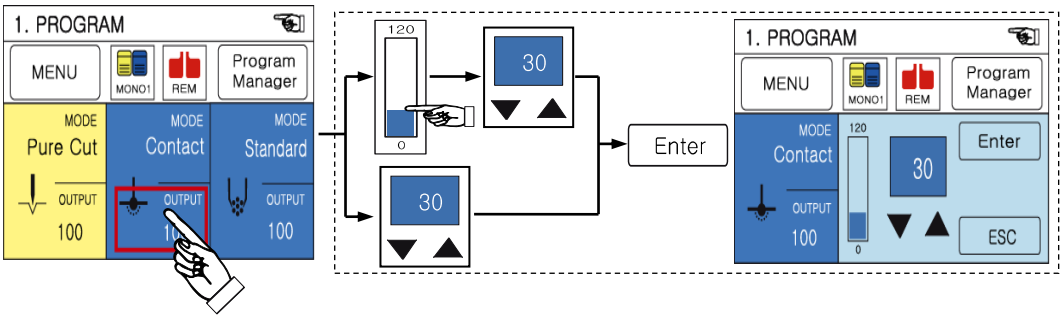


⑤ Select coagulation mode (Contact, Spray, Soft, Argon Coag.)select desired output (W) by using the decrease mark (▼) and increase mark (▲).

ⓐ Select coagulation mode

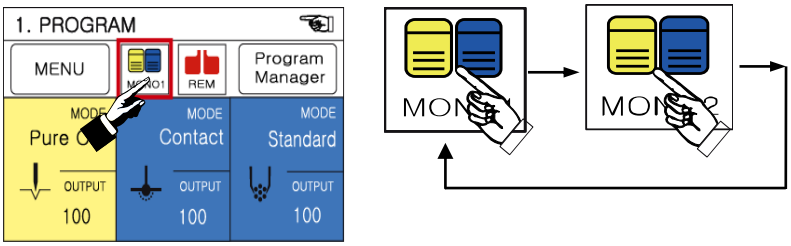


ⓑ Select coagulation mode output(W)



⑥ In case of using Twin Button Handle, connect it to the Monopolar (M1, M2) ports.

⑦ In case of using double foot switch, connect the double foot switch connector to The connection part of Monopolar Foot Switch of the back side. If set Monopolar Output Selector as Mono 1, the output comes out to the Monopolar (M1) port when pressing the double foot switch.



Notice

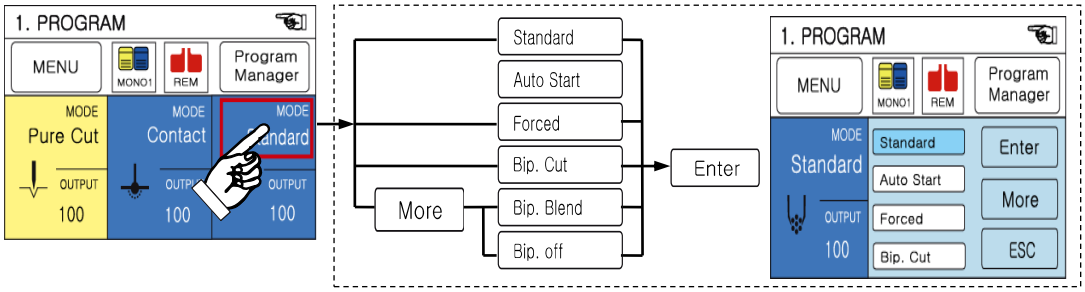
In ZEUS Vision, 2 Twin Button Handle (3-Pin) or 2 Monopolar Handle (1-Pin) accessories can be mounted. Those 2 can be connected during use but the output does not come out from both at the same time. The output comes out from the output port selected in advance. It is recommended not to connect the unused accessories.

⑧ Press the switch of Twin Button Handle or the double foot switch for use.

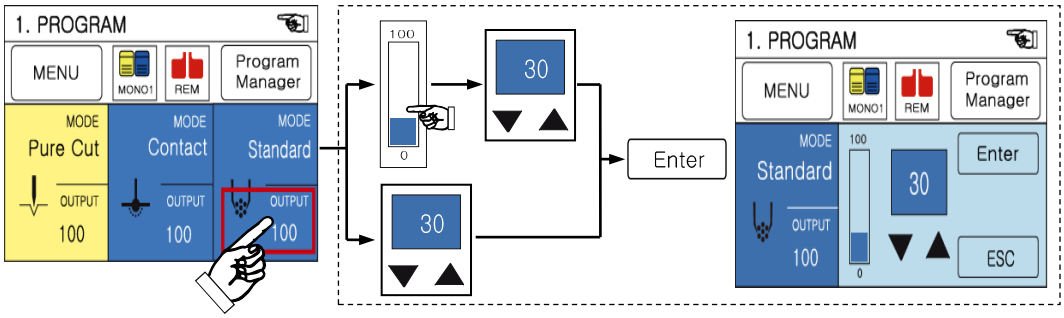
● Bipolar

① Foot Mode
- Connect single foot switch for Bipolar to the Bipolar Foot Switch connection port on the backside.
- Select bipolar coagulation and cut mode (Standard, Forced, Bipolar Cut, Bipolar Blend) and select the desired output (W) by using the decrease mark(▼) and increase mark(▲).

ⓐ Select bipolar coagulation mode



ⓑ Select bipolar coagulation mode output(W)

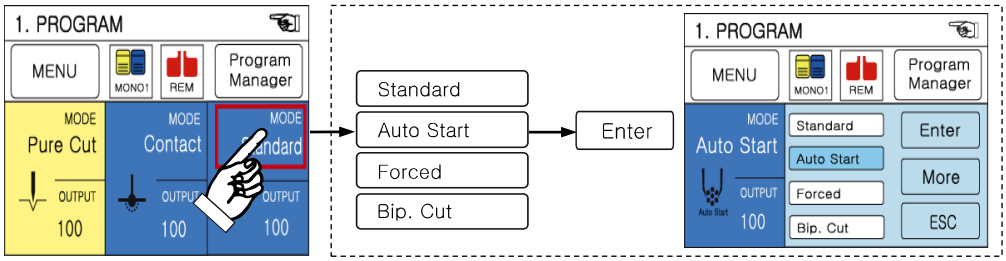


- Connect the Bipolar Cable to the bipolar forceps connection part. Press single foot switch for use.

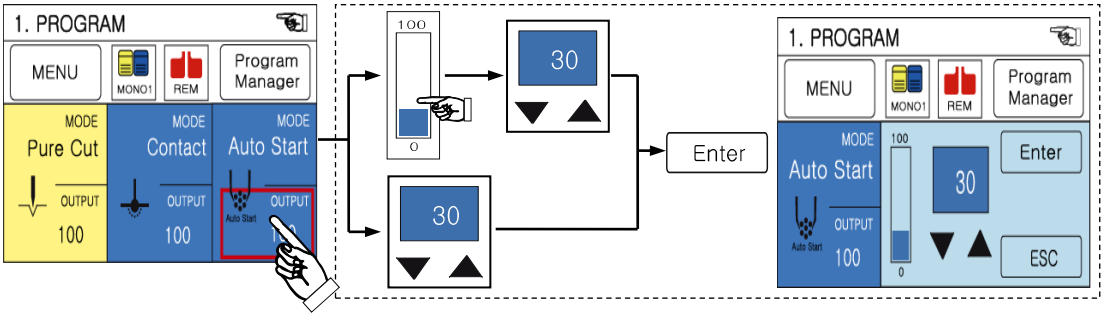
② Auto Start

- Select Auto Start mode.
- Select the desired output (W) by using the decrease mark(▼) and increase mark(▲).

ⓐ Select Auto Start mode



ⓑ Select Auto Start mode output(W)



- Connect the Bipolar Cable to the bipolar forceps connection part.

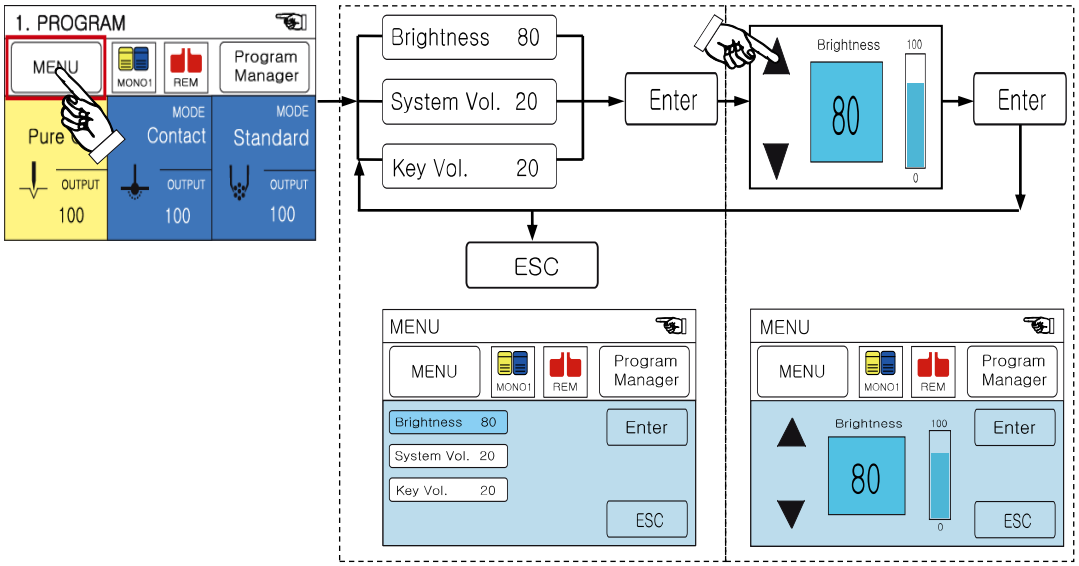
Caution

In case of using forceps, do not activate the surgery unit until it is put into contact with the patients. Be cautious of short of the both end tips which may be a direct cause of equipment failure.

● Menu & Program Management

① Select Menu and set the functions below.

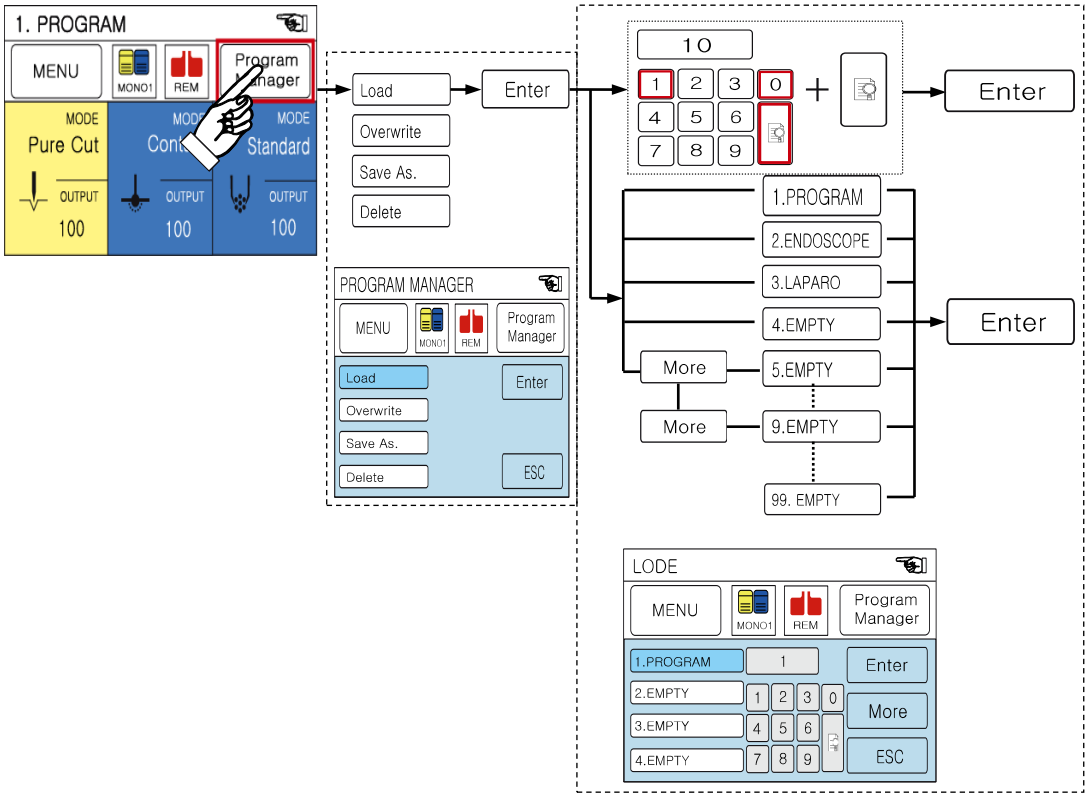
- Brightness: to set the brightness of screen
- System Vol: to set the volume of system operation
- Key Vol: to set the volume of touch and key button operation



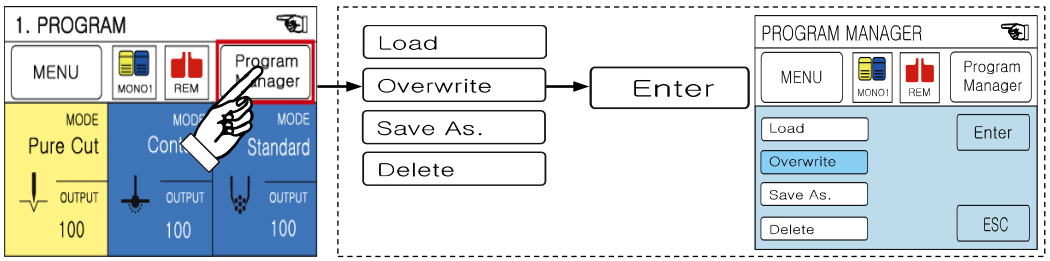
② Program Management

- Load: to select the stored data for use.
- Overwrite: to store the modes and the output (W) data.
- Save as: to save the changed mode and output (W) data in other name during using the stored data.
- Delete: to delete the stored data.

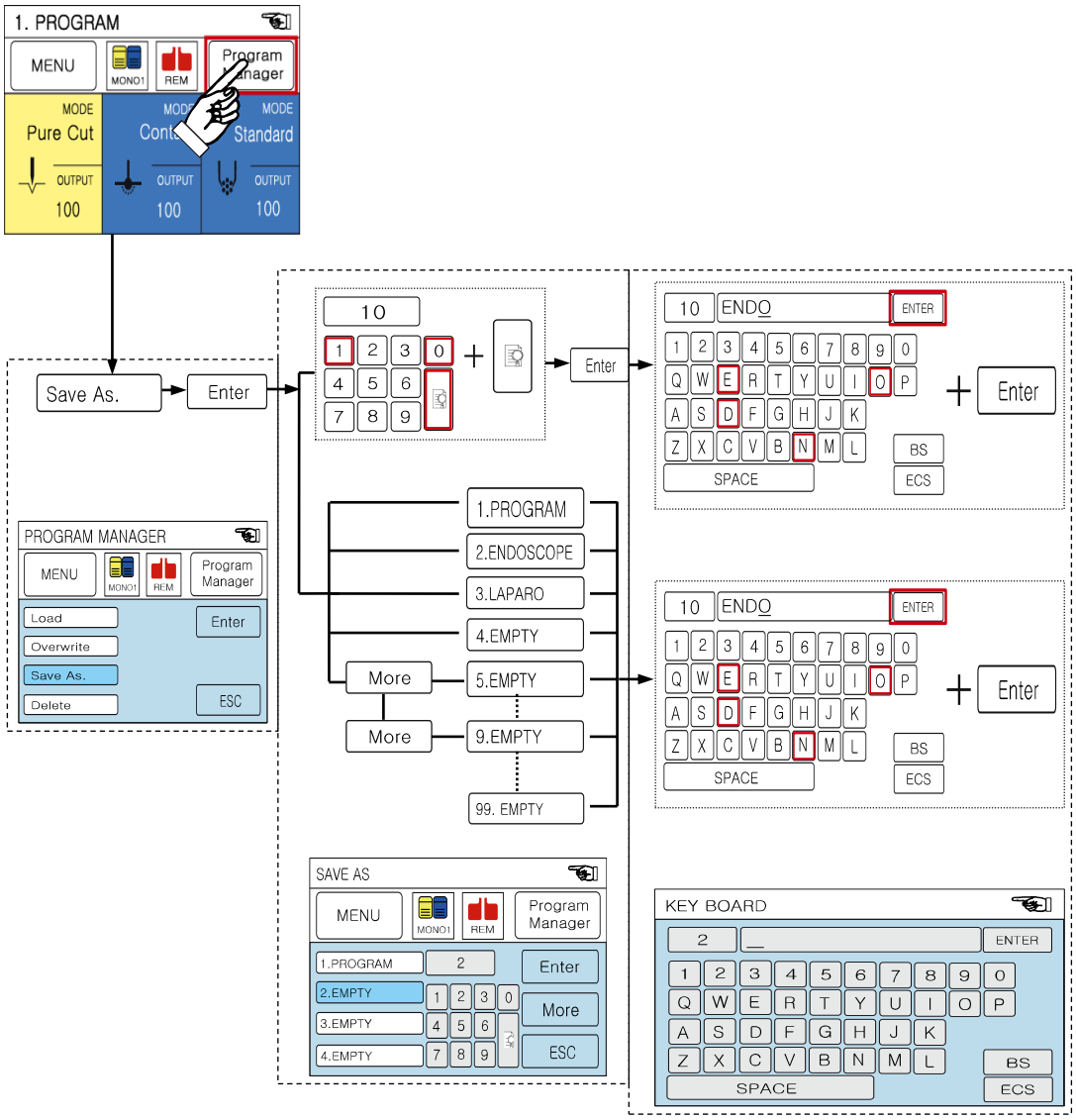
ⓐ Load



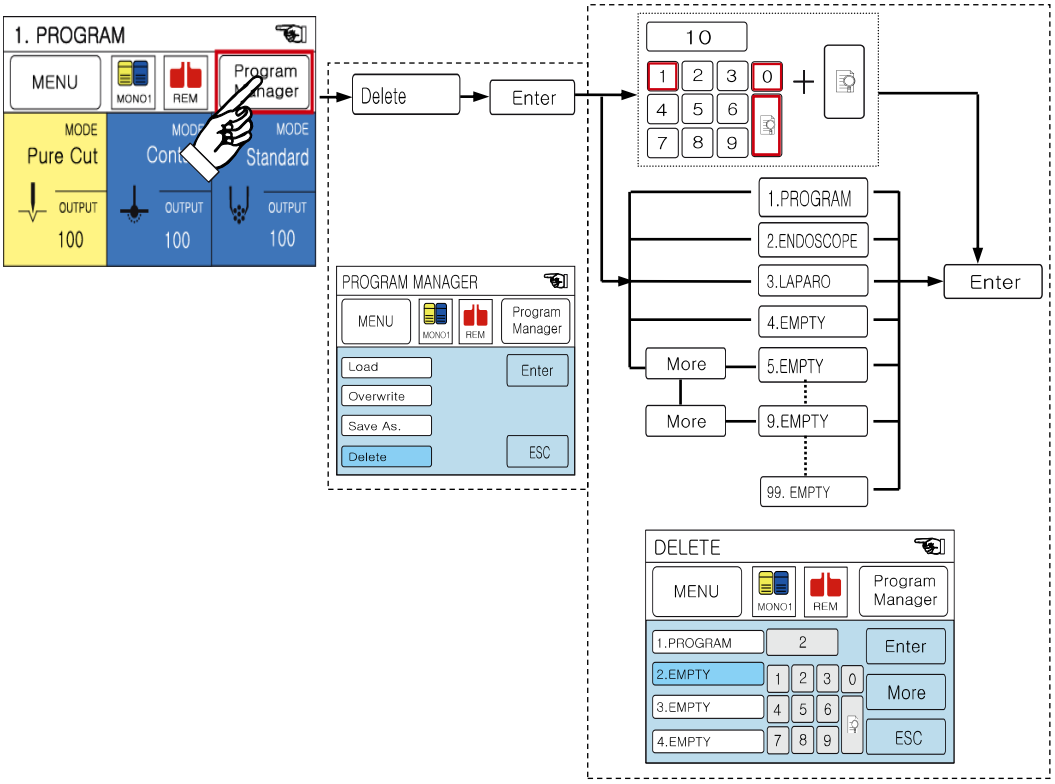
ⓑ Overwrite



ⓒ Save as


1. PROGRAM
MENU
MONO1
REM
Program Manager
MODE
Pure Cut
OUTPUT
100
MODE
Standard
OUTPUT
100
OUTPUT
100
Save As.
Enter
10
1 2 3 0
4 5 6
7 8 9
Enter
10 ENDO ENTER
Q W E R T Y U I O P
A S D F G H J K
Z X C V B N M L
SPACE
BS
ECS
Enter
PROGRAM MANAGER
MENU
MONO1
REM
Program Manager
Load
Overwrite
Save As.
Delete
Enter
ESC
1.PROGRAM
2.ENDOSCOPE
3.LAPARO
4.EMPTY
More
5.EMPTY
More
9.EMPTY
99. EMPTY
10 ENDO ENTER
Q W E R T Y U I O P
A S D F G H J K
Z X C V B N M L
SPACE
BS
ECS
Enter
SAVE AS
MENU
MONO1
REM
Program Manager
1.PROGRAM
2.EMPTY
3.EMPTY
4.EMPTY
2
1 2 3 0
4 5 6
7 8 9
Enter
More
ESC
KEY BOARD
2
ENTER
1 2 3 4 5 6 7 8 9 0
Q W E R T Y U I O P
A S D F G H J K
Z X C V B N M L
SPACE
BS
ECS

ⓓ Delete

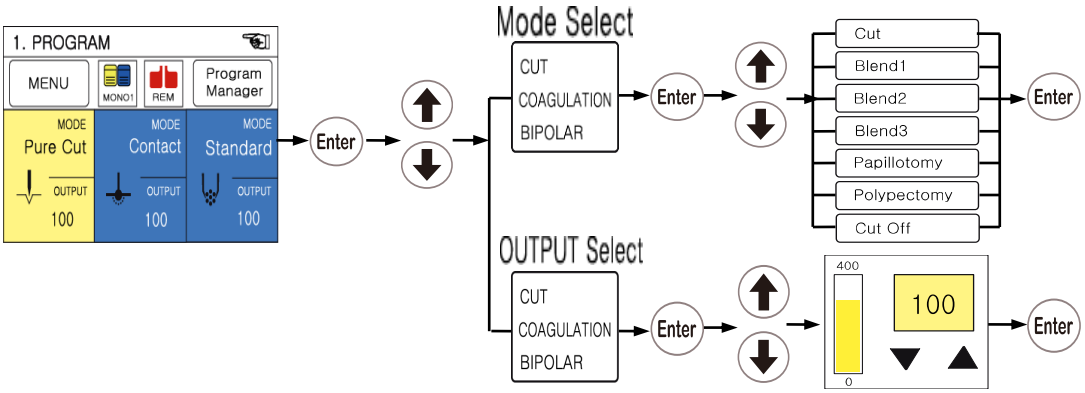


● Control Key

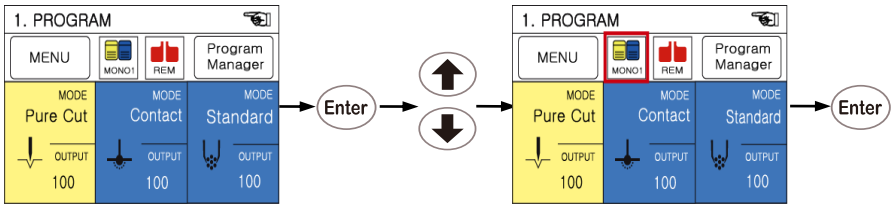
When selecting Enter button, selection bar in red is generated. When pressing increase mark(▲) button, it moves Cut Mode → Cut Watt → Coag Mode → Coag Watt → Bipolar Mode → Bipolar Watt → Mono1 → Program Management and when pressing decrease mark (▼) button, it moves in the reverse direction.
Selected menu is set and activated by pressing Enter button.

- Esc Button: to move to the previous menu.
- Menu Button: to select menus like Brightness, System Vol. Key Vol. etc.
- Enter Button: to confirm and perform the selected menu.
- Decrease Selection Button: to lower output and to move menu
- Increase Selection Button: to lower output and to move menu

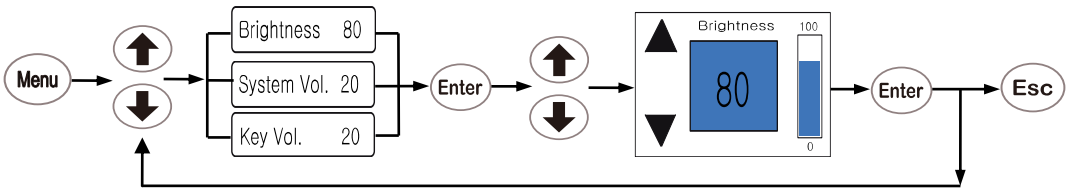
① Select mode and output(W)
Select cut mode (Cut, Blend1, Blend2, Blend3, Papillotomy, Polypectomy), Coagulation mode (Contact, Spray, Soft, Argon Coag.), Bipolar coagulation (Standard, Auto Start, Forced, Bipolar Cut, Bipolar Blend) and select desired output (W) by using the decrease mark (▼) and increase mark (▲).



② Select MONO1, 2 output
If set Monopolar Output Selector as Mono 1, the output comes out to the Monopolar (M1) port when pressing the double foot switch.

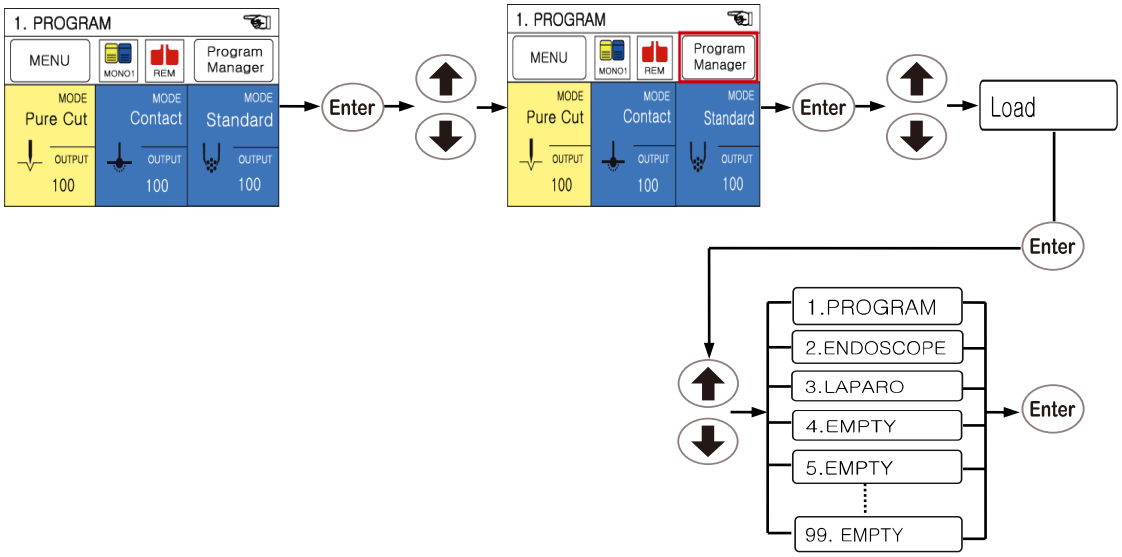


③ Select MENU
Select Menu and set the functions below.
- Brightness: to set the brightness of screen
- System Vol: to set the volume of system operation
- Key Vol: to set the volume of touch and key button operation

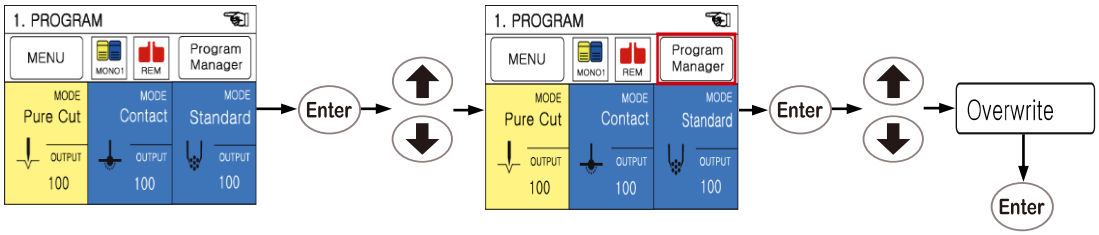


④ Select Program Manager
You can select Load, Overwrite, Save as, Delete functions.

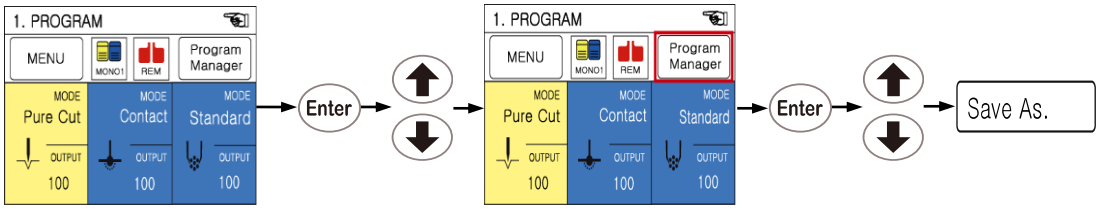
ⓐ Load
to select the stored data for use.

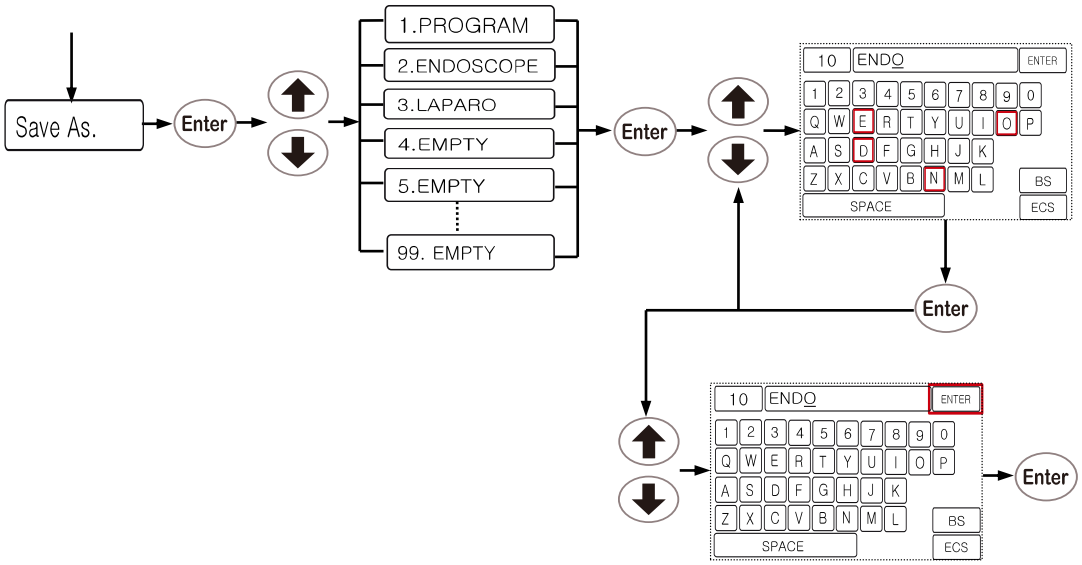


ⓑ Overwrite
to store the modes and the output (W) data



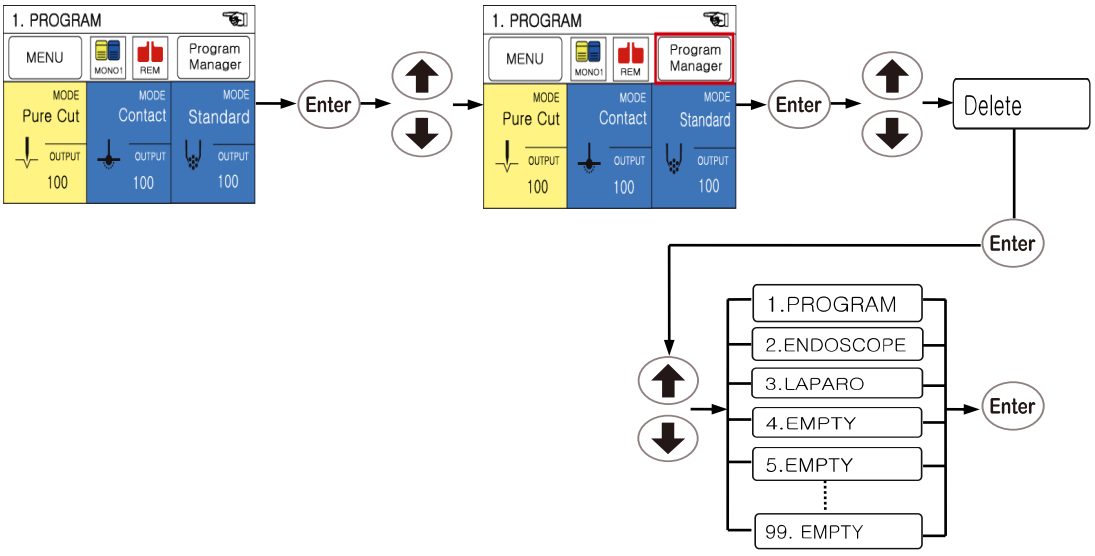
ⓒ Save As.
to save the changed mode and output (W) data in other name during using the stored data.





ⓓ Delete

to delete the stored data.

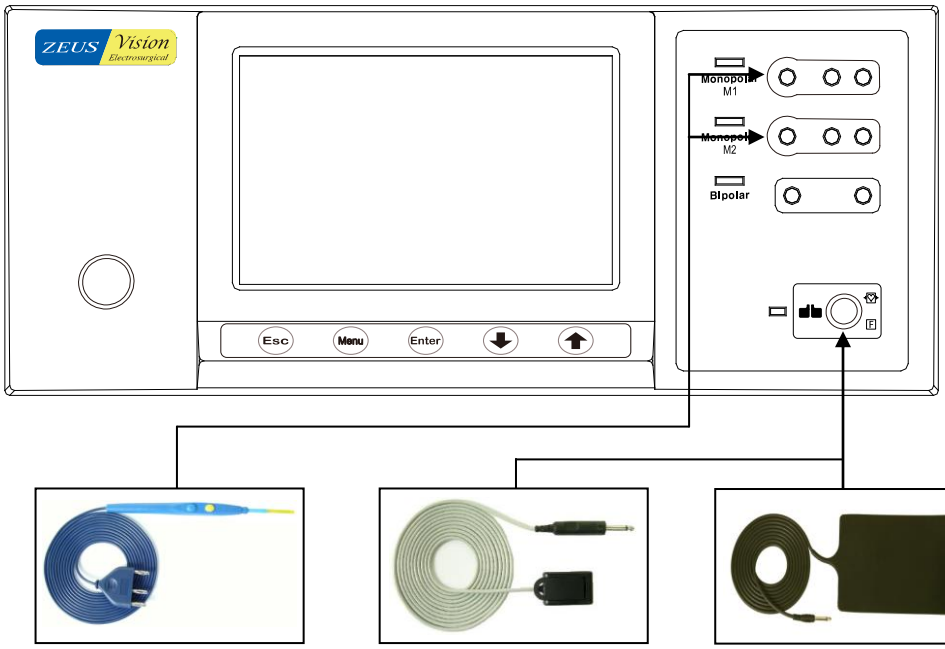


● Power off : Turn the electrosurgical unit OFF and disconnect the power cord from the Receptacle(wall mains outlet).

● Make sure that the electrosurgical unit and foot switch are completely dry before Storage.

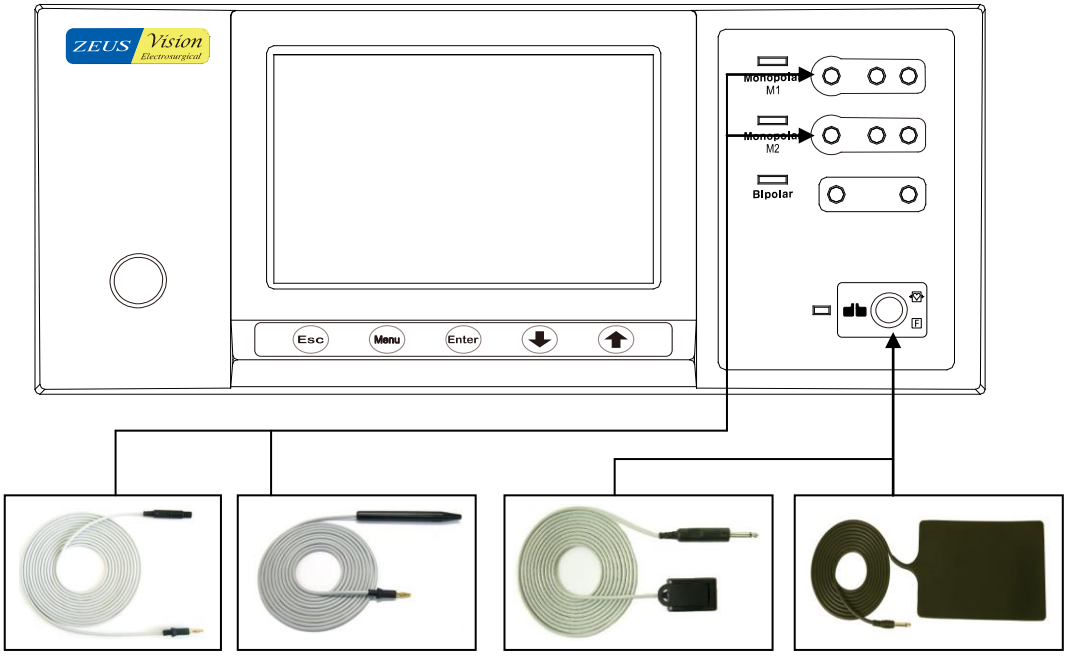
5.7 Accessory Diagram

● Diagram of Twin Button Handle and Patient Plate



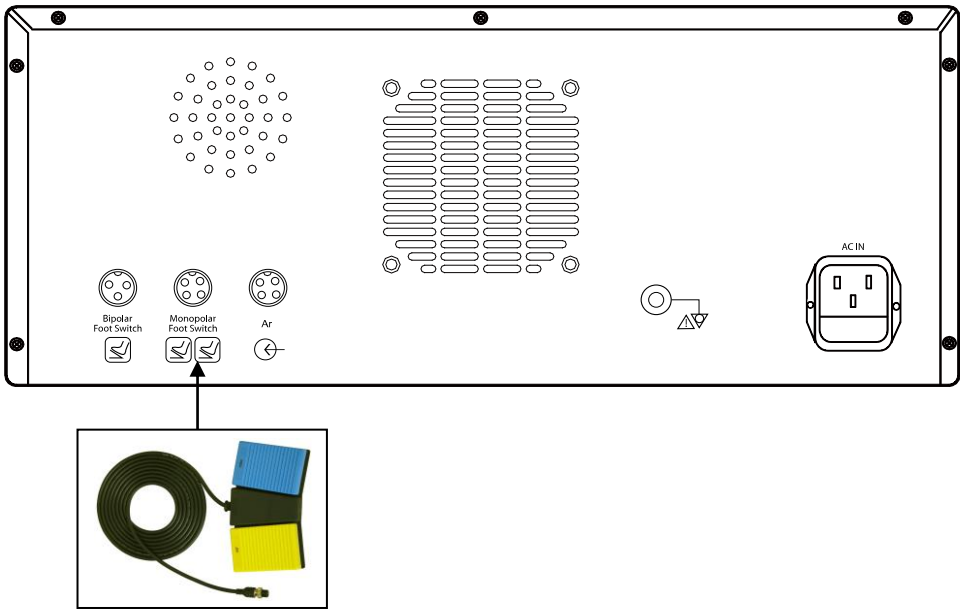
(Twin Button Handle) (Patient Return Plate Cable) (Silicone Patient Plate)

● Diagram of Monopolar Handle and Patient Plate



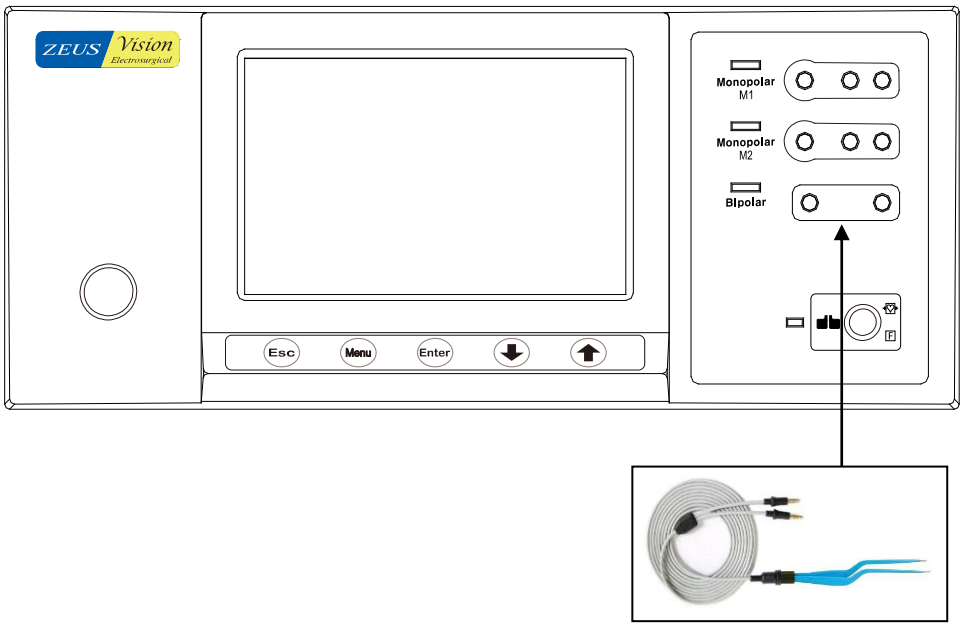
(Monopolar Connecting Cable) (MonoPolar Handle) (Patient Return Plate Cable) (Silicone Patient Plate)

● Diagram of Double Foot Switches



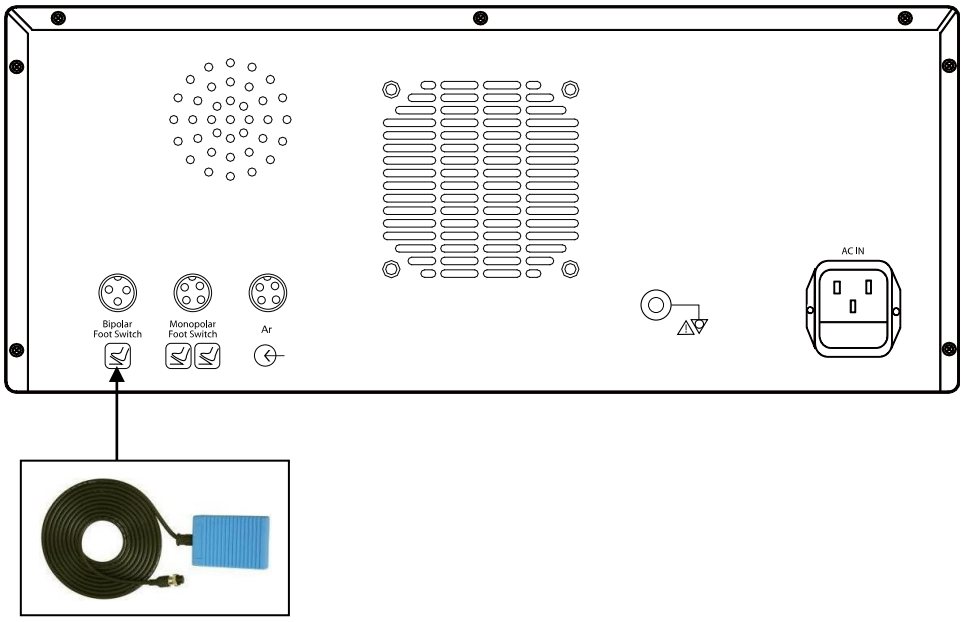
(Double Foot Switch)

● Diagram of Bipolar Forceps and Cable



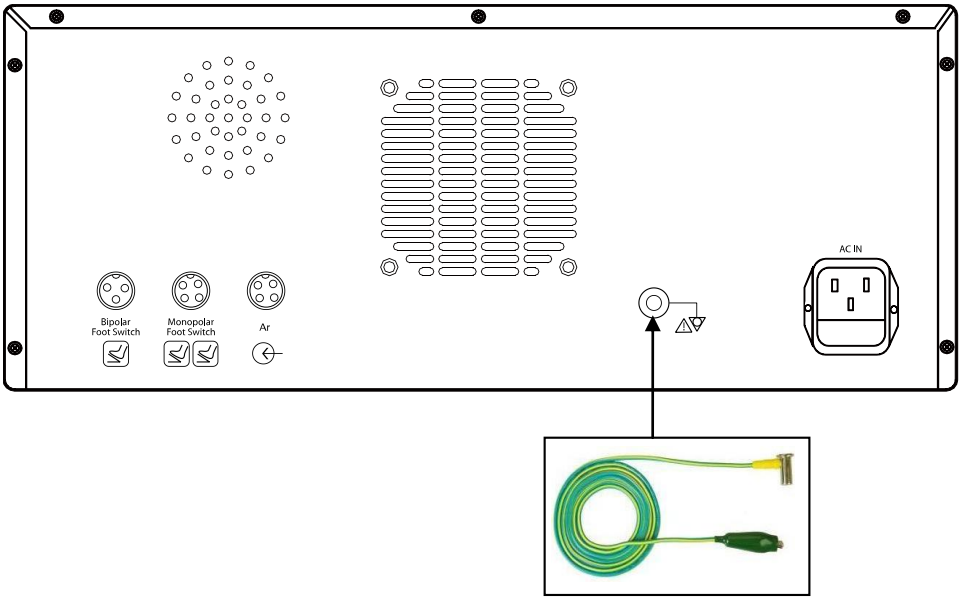
(Bipolar Forceps)

● Diagram of Single Foot switches



(Single Foot Switch)

● Diagram of Foot Switch Signal Cable and Ground Cable



(Ground Cable)

6. Periodic Inspection

Every six months, visually inspect the ZEUS VISION Electrosurgical Generator for signs of wear or damage.

In particular, look for any of the following problems:

- ✓ Damage to the power cord
- ✓ Damage to the power cable receptacle
- ✓ Obvious damage to the unit
- ✓ Damage to any receptacle
- ✓ Accumulation of lint or debris in or around the unit

7. Technical Factors

7.1 Specification

Model Name	ZEUS VISION
Rated Voltage	AC120 / AC230V
Rated Frequency	50 / 60Hz
Power Consumption	1200VA + 10%
Fuse	T10AH when AC120V / T6.3AL when AC230V
Protection class	Class 1, Type CF
Leakage current	in acc. with IEC601,Part2-2
Carrier Frequency	400㎑, 500㎑
Repeat Frequency	33㎑
Size (W×D×H)	390mm × 410mm × 160mm
Weight	12.5Kg
Using Environment	
Operation temperature	10℃ to 40℃
Storage temperature	-10℃ to 60℃
Humidity	20% to 95% RH,
Operation altitude	700mbar ~ 1060mbar
Operation Cycle	10sec ON 30sec Idle
Cooling	1 inner fan

※ These parameters can be changed without notice.

7.2 Output

● ZEUS VISION

Tolerance: ±20%

Mode	Output Power	Carrier Freg.	Crest Factors	Duty Rate	Repeat Freg.
Pure Cut	400W at 200ohm	400kHz	1.7	100%	Continuous
Blend1	250W at 200ohm	400kHz	3.0	70%	33kHz
Blend2	200W at 200ohm	400kHz	3.0	55%	33kHz
Blend3	150W at 200ohm	400kHz	3.3	45%	33kHz
Papillatomy	150W at 200ohm	400kHz			
Polypectomy	150W at 200ohm	400kHz			
Contact Coagulation	120W at 200ohm	400kHz	3.0	40%	33KHz
Spray Coagulation	100W at 300ohm	400kHz	3.5	8.0%	33kHz
Soft Coagulation	80W at 100ohm	400kHz	1.4	100%	Continuous
Argon Coagulation	100W at 300ohm	400kHz	3.5	8.0%	33kHz
Bipolar Standard	100W at 100ohm	500kHz	2.0	100%	Continuous
Bipolar Auto Start	100W at 100ohm	500kHz	1.3	100%	Continuous
Bipolar Forced	80W at 100ohm	500kHz	2.9	30%	33KHz
Bipolar Cut	120W at 200ohm	500kHz	1.6	100%	Continuous
Bipolar Blend	100W at 200ohm	500kHz	2.7	65%	33KHz

※ These parameters can be changed without notice.

8. Standard Output Table by Surgery Part

Part	Cut Mode	Cut POWER(W)	Coagulation Mode	Coagulation POWER(W)	Bi-coag.
Skin Cutting	Pure or Blend1	10~120 8~100			
Muscle Dessection	Pure or Blend1	Above 15 Above 15			
Tumor Excision	Blend2 Blend3	15~80 15~70	Spray	10~15	
Stomach, Intestine resection	Blend2 or Blend3	20 and Up 20 and Up			
Hemostasis			Pure Coagulation	10~65	3~22
Neuro Surgery	Blend2 or Blend3	Loop 20~80 20~70	Pure Coagulation	Ball 10~25	1~8
Massive Coagulation			Spray Coagulation	10~30	
Prostatic Resection	Pure or Blend1	65 and Up 55 and Up	Spray	15 and Up	
Bladder Fulguration			Spray	12~30	
Cervical Conization	Blend2	10~80	Pure Coagulation	25~70	
Bartholin and Skeneis	Blend3	15~30	Spray	12~22	
Tubal	Blend2	8~50			10~20
Proctologic	Blend3	8~40	Spray	10~22	
Abscess/Cyst	Blend3	10~80	Spray	10~15	
Rectal, Sigmoid	Blend3	Lancet 8~30 Loop 10~20	Pure	12~30	

9. Troubles and What to do with them

● There are no lights on the LCD Display window.

1. Check if the power cord is connected to the power cord input plug on the back side of the surgery unit.
2. Check if the power switch of the surgery unit is on.
3. Check the fuse (AC120V: T10AH 250V/ AC230V: T6.3AL 250V) on the back side of the equipment.
4. If the trouble continues, use the auxiliary equipment.

● No output.

1. Check if the plug of patient return plate cable is connected to the surgery unit.
2. Check if the patient return plate is accurately connected with the patient.
3. Check if the accessories (Twin Button Handle, Monopolar Handle and Foot Switch) are connected.
4. Change the accessories such as Twin Button Handle, Monopolar Handle and Foot Switch and others.
5. Check if the output is set low.
6. If the trouble continues, use the auxiliary equipment.

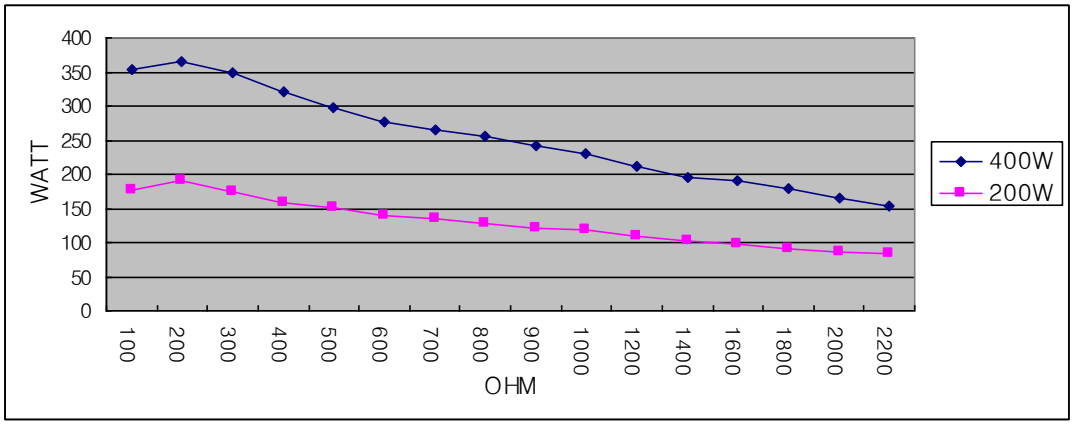
● The alarm rings all the time.

1. When the patient plate has troubles.
   ① Check if the plug of patient plate cable is connected to the surgery unit.
   ② Change the patient plate.
   ③ If the trouble continues, use the auxiliary equipment.

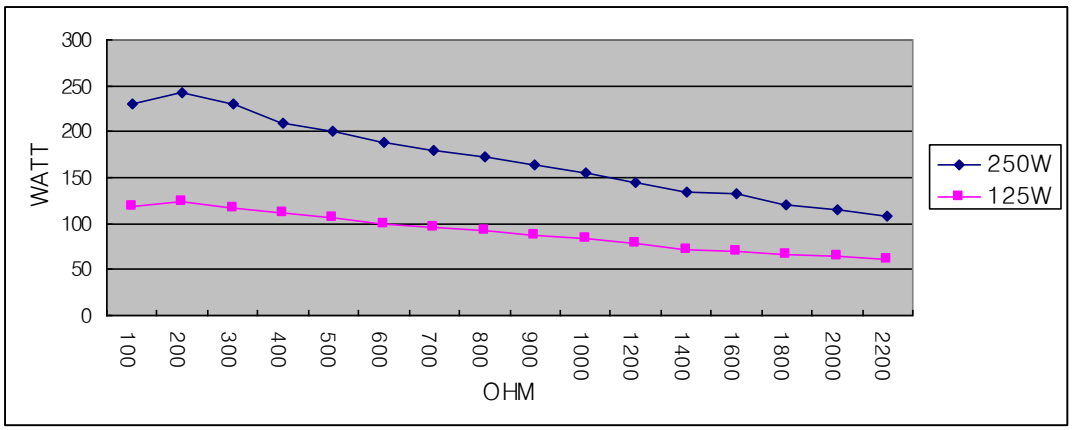
2. When the patient return plate has troubles.
   ① Check if the plug of patient return plate cable is connected to the surgery unit.
   ② Check if the entire surface of patient return plate is adhered to the patient.
   ③ Check if the patient return plate is connected to the patient return plate cable.
   ④ Change the patient return plate cable.
   ⑤ If the trouble continues, use the auxiliary equipment.

10. Load Regulation

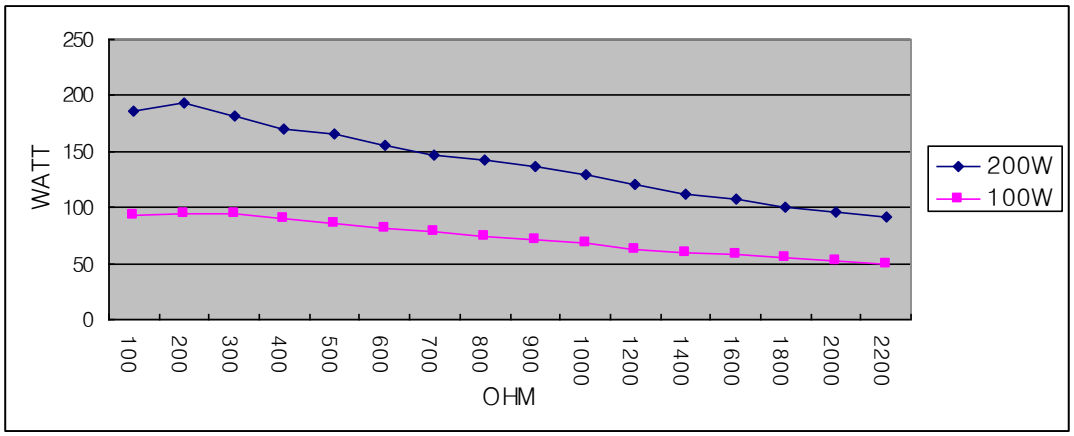
10.1 Pure Cutting



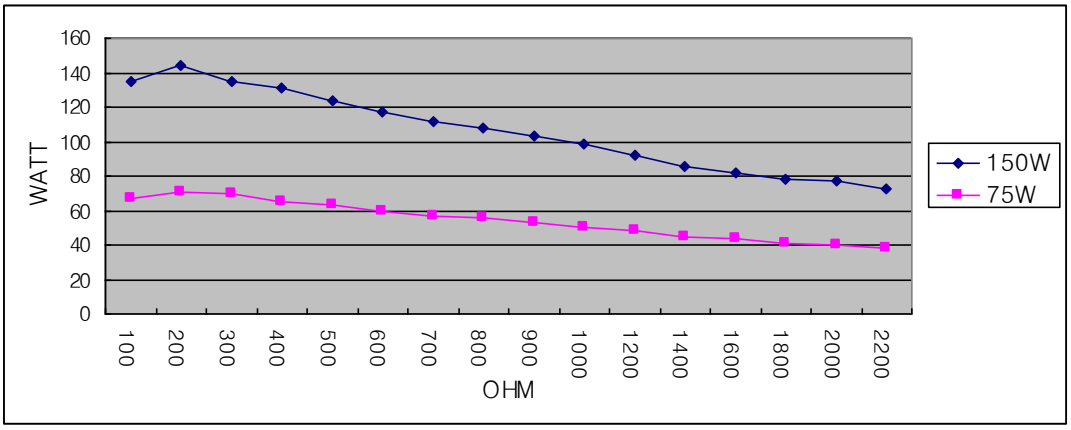
10.2 Blend1



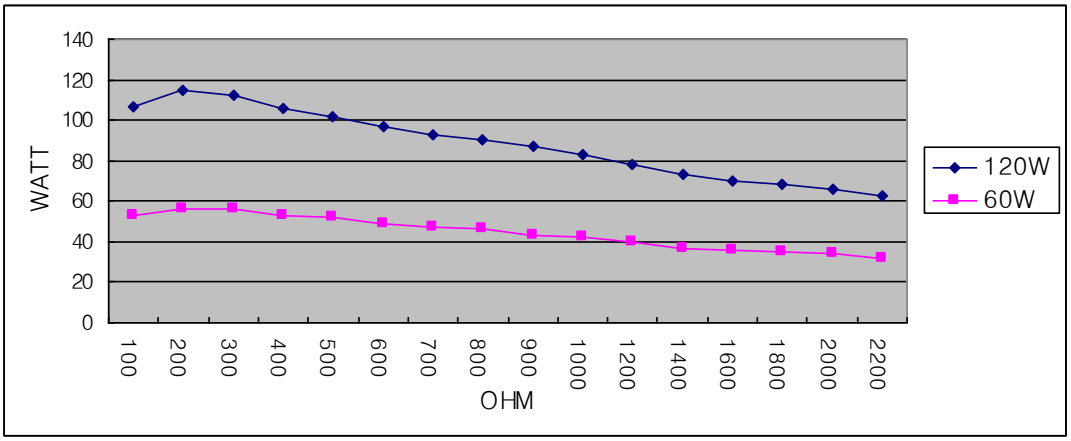
10.3 Blend2



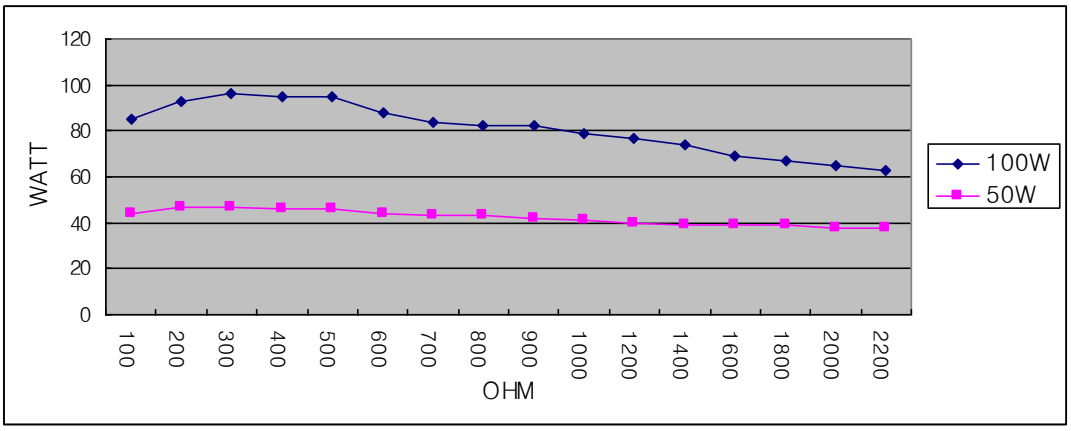
10.4 Blend3



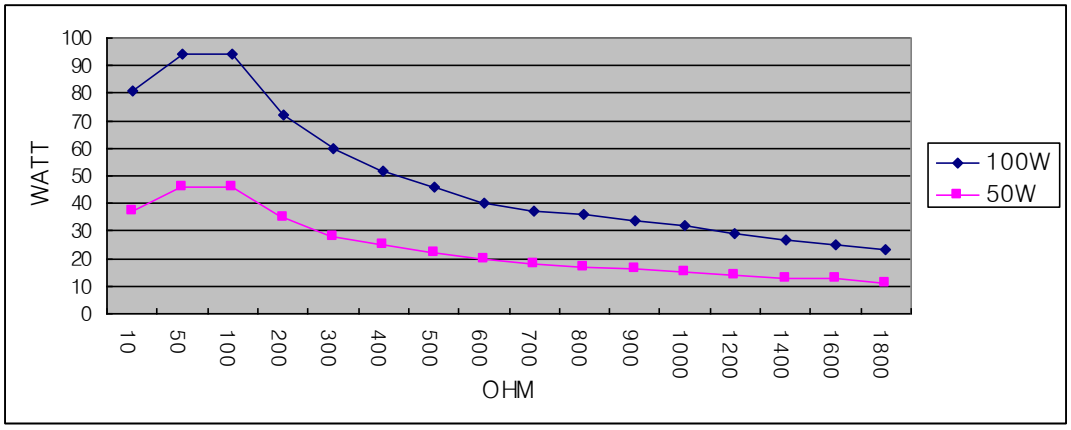
10.5 Contact Coagulation



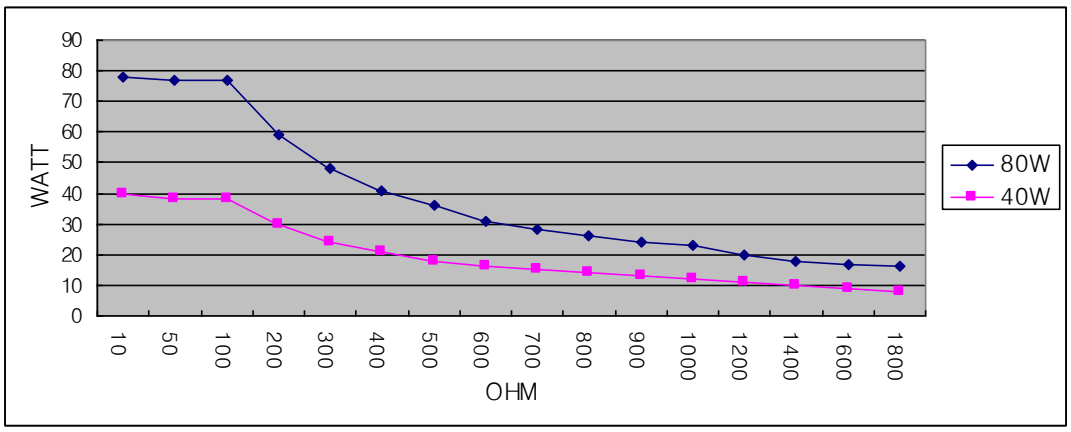
10.6 Spray Coagulation



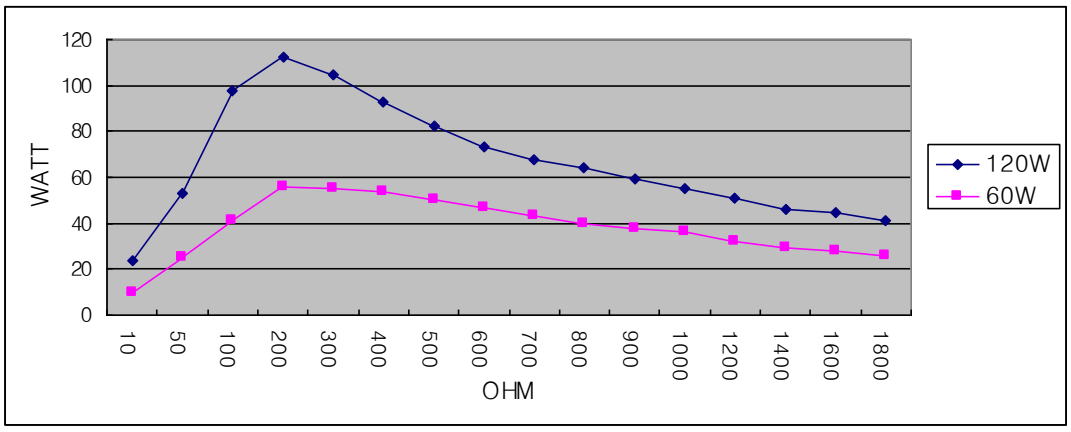
10.7 Bipolar Standard, Bipolar Auto Start



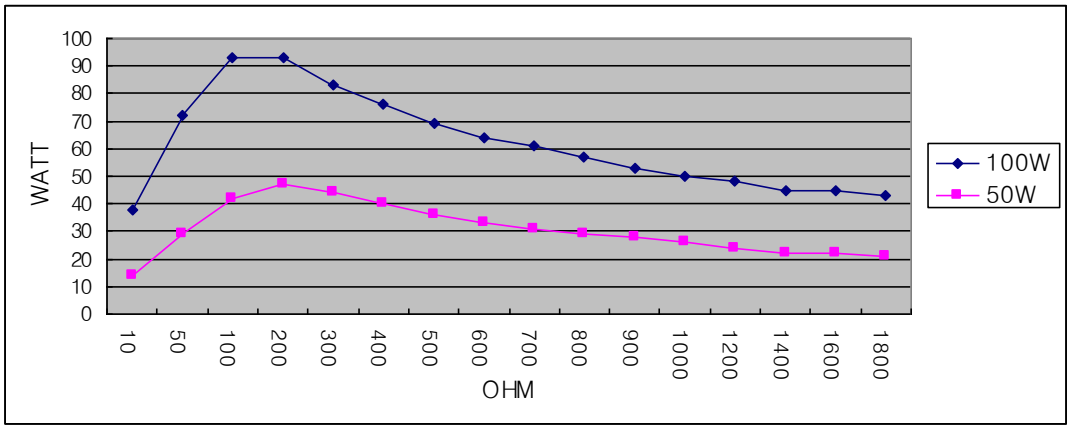
10.8 Bipolar Forced



10.9 Bipolar Cut



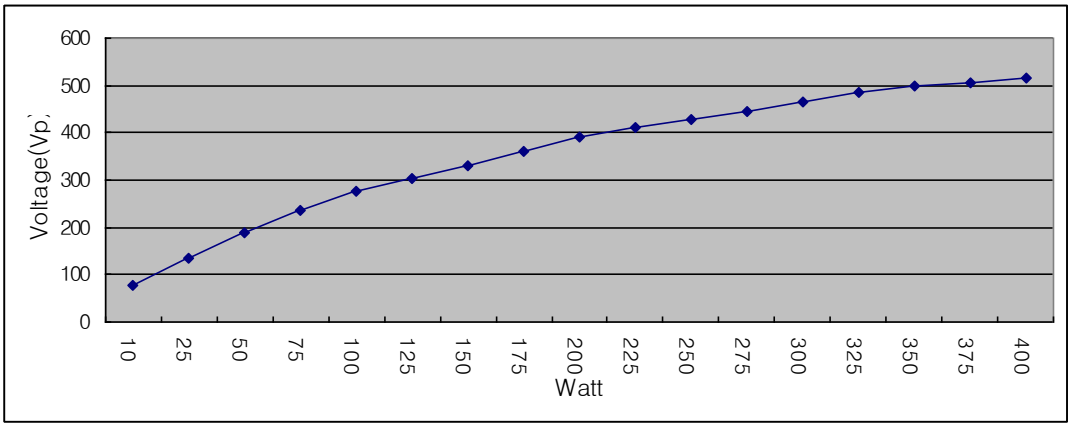
10.10 Bipolar Blend



11. Voltage Output Graphic

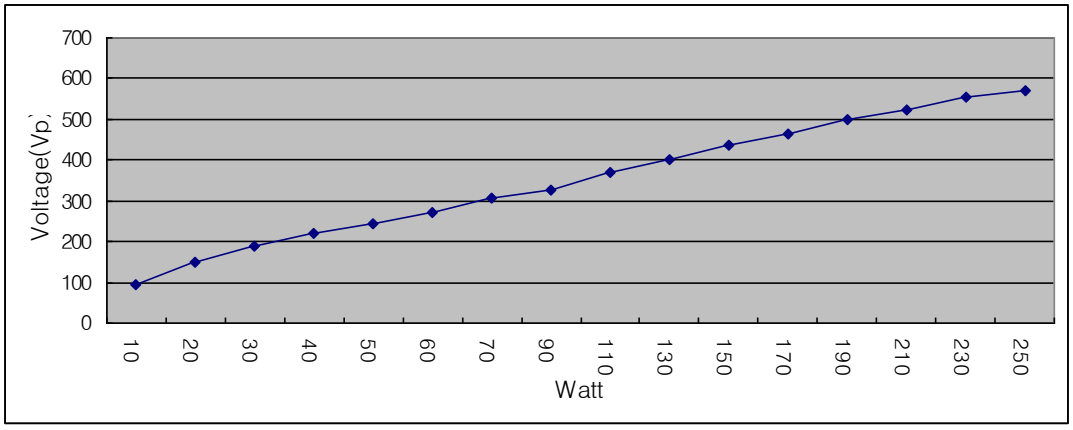
11.1 Pure Cutting (Load 200Ω)

Max Peak Output Voltage : 516Vp



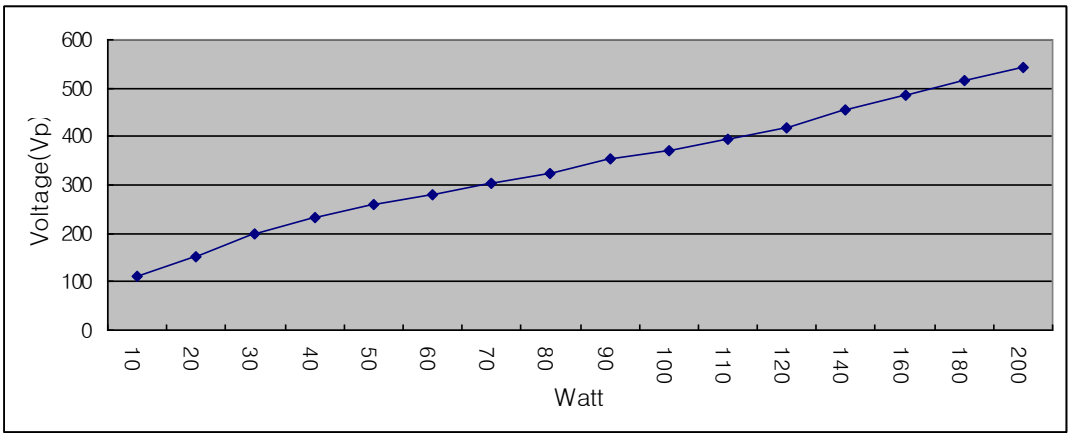
11.2 Blend1 (Load 200Ω)

Max Peak Output Voltage : 572Vp



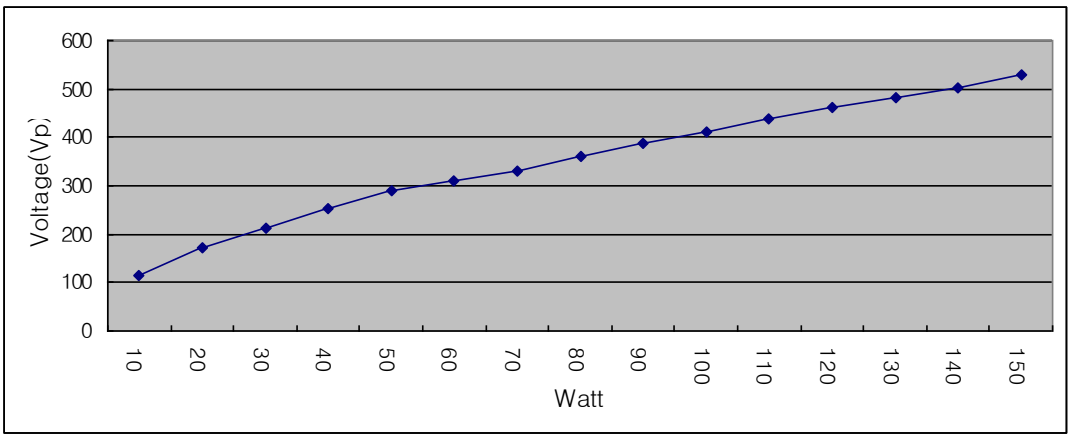
11.3 Blend2 (Load 200Ω)

Max Peak Output Voltage : 544Vp



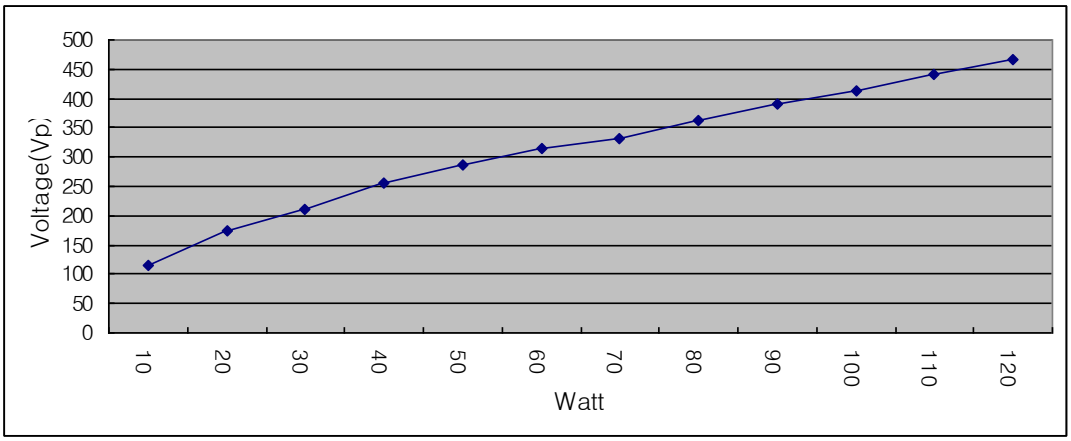
11.4 Blend3 (Load 200Ω)

Max Peak Output Voltage: 528Vp

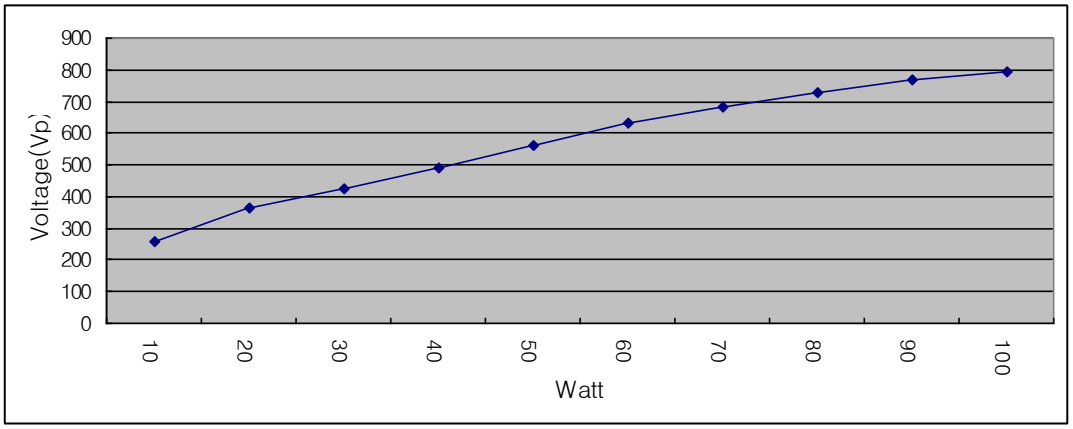


11.5 Contact Coagulation (Load 200Ω)

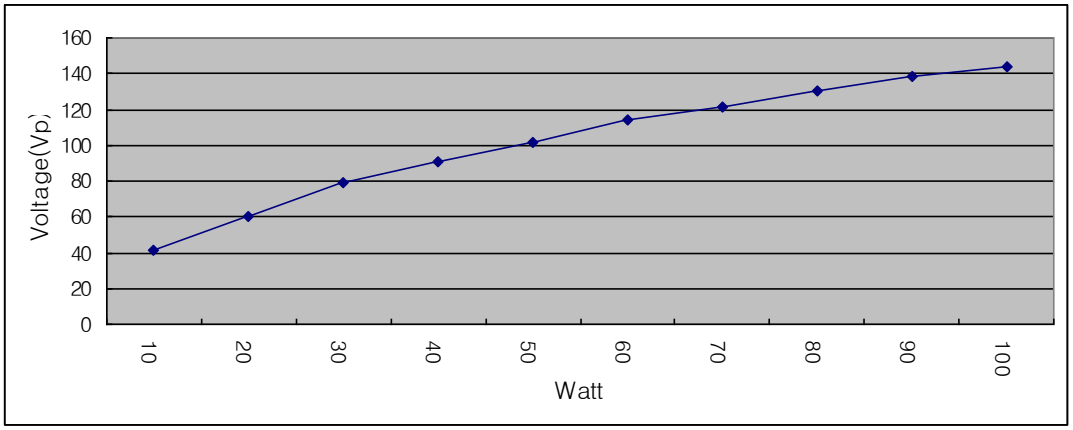
Max Peak Output Voltage : 467Vp



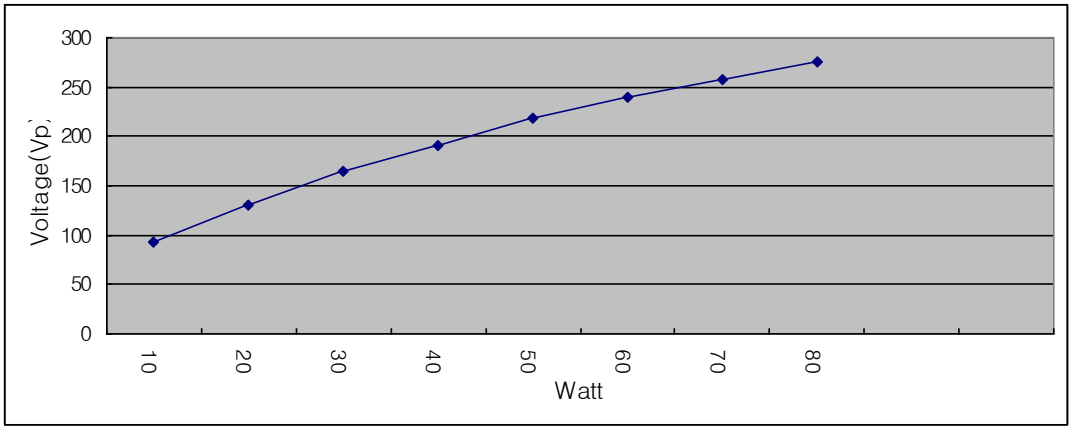
11.6 Spray Coagulation (Load 300Ω) Max Peak Output Voltage : 793Vp



11.7 Bipolar Standard , Auto Start (Load 100Ω) Max Peak Output Voltage : 144Vp

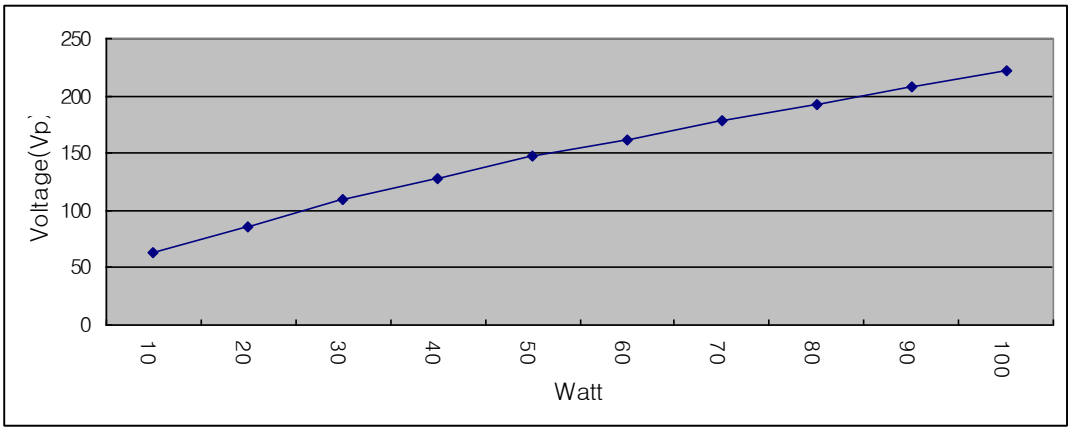


11.8 Bipolar Forced (Load 100Ω) Max Peak Output Voltage : 276Vp



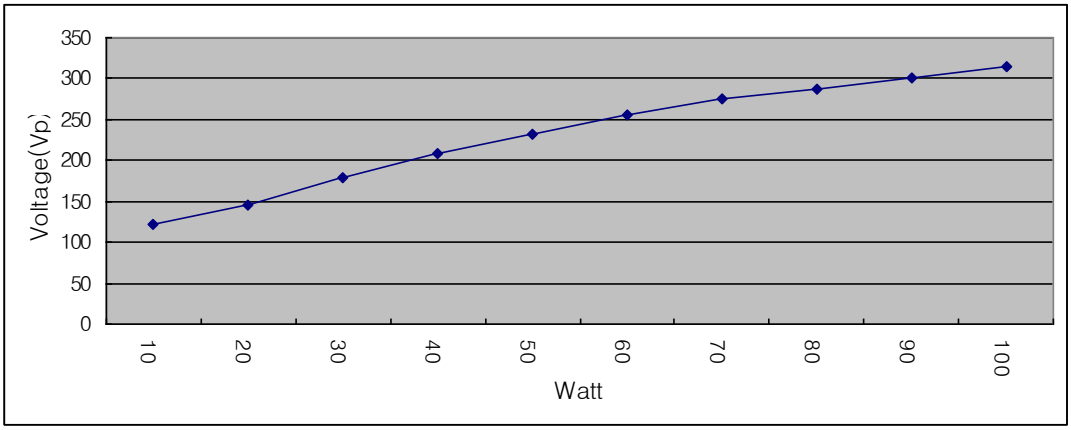
11.9 Bipolar Cut (Load 200Ω)

Max Peak Output Voltage : 245Vp



11.10 Bipolar Blend (Load 200Ω)

Max Peak Output Voltage : 315Vp



12. Appendix

12.1 Electromagnetic Compatibility (EMC) Information

Warning 

Check the followings before using this product.

① Medical electrical equipment needs special precautions regarding Electromagnetic Compatibility (EMC). Observe the EMC instructions in this appendix during installation and operation.

② The use of portable and mobile RF equipment may have an impact on this and other pieces of medical equipment.

NOTE: The tables and guidelines that are included in this Appendix provide information to the customer or user that is essential in determining the suitability of the equipment or system for the electromagnetic environment of use, and in managing the electromagnetic environment of use to permit the equipment or system to perform its intended use without disturbing other equipment and systems or non-medical electrical equipment. If this equipment does cause harmful interference with other devices, 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) is connected.

Table 201
Guidance and manufacturer's declaration – electromagnetic emissions

ZEUS VISION model is intended for use in the electromagnetic environment specified below. The customer or user of the ZEUS VISION model should ensure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	
RF emissions CISPR 11	Class A	The ZEUS VISION model is suitable for usage in all establishments (e.g. hospitals and doctors' offices) except domestic establishments those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Table 202
Guidance and manufacturer's declaration – electromagnetic immunity

ZEUS VISION model is intended for use in the electromagnetic environment specified below. The customer or user of the ZEUS VISION model should ensure that it is used in such an environment.

Emissions test	EN/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	Complies ± 8 kV contact ± 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 transient/burst 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 Line-to-line IEC 61000-4-5	± 0.5 kV,± 1 kV	± 1 kV	Mains power quality should be that of a typical commercial or hospital environment.
Surge Line-to-ground IEC 61000-4-5	± 0.5 kV,± 1 kV, ± 2 kV	± 2 kV	
Voltage dips IEC 61000-4-11	0% UT; 0.5 cycle At 0°,45°,90°,135°, 180°,225°,270° and 315°	0% UT; 0.5 cycle At 0°,45°,90°,135°, 180°,225°,270° and 315°	Mains power quality should be that of a typical commercial or hospital environment. If the user of the equipment or system requires continued operation during power mains interruptions, it is recommended that the equipment or system be powered from an uninterruptible power supply or a battery.
	0% UT; 1 cycle And 70% UT; 25/30 cycles single phase: at 0°	0% UT; 1 cycle And 70% UT; 25/30 cycles single phase: at 0°	
Voltage interruptions IEC 61000-4-11	0% UT; 250/300 cycle	0% UT; 250/300 cycle	
RATED Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

* Note: *UT* is the a.c. mains voltage prior to application of the test level.

Table 204
Guidance and manufacturer's declaration – electromagnetic immunity – for equipment and systems that are not life-supporting

ZEUS VISION model is intended for use in the electromagnetic environment specified below. The customer or user of the ZEUS VISION model should ensure that it is used in such an environment.

Emissions test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 0.15 MHz-80 MHz 6V in ISM bands between 0.15 MHz and 80 MHz 80% AM at 1 kJHz	3 Vrms 0.15 MHz-80 MHz 6V in ISM bands between 0.15 MHz and 80 MHz 80% AM at 1 kJHz	Portable and mobile RF communications equipment should be used no closer to any part of the ZEUS VISION model, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = \left[\frac{3,5}{V_1}\right]\sqrt{P}$ $d = \left[\frac{3,5}{E_1}\right]\sqrt{P}$ 80 MHz to 800 MHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$ 800 MHz to 2.7GHz Where P is the maximum output power rating of the transmitter in watts [W] according to the transmitter manufacturer and d is the recommended separation in meters [m]. Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a] , should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	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	

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

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

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1]V/m.

Table
Test specifications for Enclosure port immunty to RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Service[a]	Modulation[b]	Maximum Power (W)	Distance (m)	Immunity Test level (V/m)
385	380-390	TETRA 400	Pulse modulation 18Hz	1,8	0,3	27
450	430-470	GMRS 460, FRS 460	FM[c] ±5 kHz deviation 1 kHz sine	2	0,3	28
710	704-787	LTE Band 13,17	Pulse modulation 217Hz	0,2	0,3	9
745						
780						
810	800-960	GSM 800/900, TETRA 800, iDEN820, CDMA 850, LTE Band 5	Pulse modulation 18Hz	2	0,3	28
870						
930						
1720	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1,3,4,25; UMTS	Pulse modulation 217Hz	2	0,3	28
1845						
1970						
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217Hz	2	0,3	28
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation 217Hz	0,2	0,3	9
5500						
5785						

Note: If necessary to achieve the immunity test level, the distance between the transmitting antenna and the ME Equipmnet or ME System may be reduced to 1m test distance is permitted by IEC 61000-4-3.
a) For Some Services, Only the uplink frequncies are included.
b) The carrier shall be modulated using a 50% duty cycle square wave signal.
c) As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Warranty

Name of product		Electrosurgical Unit
Model no.		ZEUS VISION
License no.		
Product no.		
Term of guarantee		Within one year from the date of purchase
Customer Detail	Name of hospital	
	Address	
	Name	
	Phone	
Name of seller		
Name of manufacture		ZERONE Co., Ltd. (Shinil IT UTO Bldg., Dangjeong-dong) 8F, LS-ro 13, Gunpo-si, Gyeonggi-do, 15843, Republic of Korea Phone : + 82 31 427 2772 Fax : + 82 31 427 2332

※ Thanks for purchasing of ZEUS VISION from ZERONE Co., Ltd.
※ This product is made under thorough quality control and passed strict inspections.

Document History

REV.No	Edited Date	Corrections
00	2009.10.06	Initial issued
01	2012.04.25	Change address, EMI
02	2013.04.26	Applied to 60601-1 3rd Edition.
03	2016.06.16	Add Caution
04	2016.10.12	Change of address (European agent)
05	2016.11.10	Add Caution
06	2017.06.08	Change CE number
07	2019.03.02	IEC 60601-1-2:2014 (4th Edition)