Electrosurgical Generator

ELPIS-4

ELPIS-3

ELPIS-2

User's Manual

Ver 1.00

REMED

Rehabilitation Medical Company

Table of Contents

General

Thank you for purchasing ELPIS-4/3/2. Before you operate ELPIS-4/3/2, you need to read this manual carefully and please make sure you fully understand every function in the equipment for stabilized capacity and for safe usage.

Make sure to fully understand basic features, use methods, and maintenance of the equipment by reading this manual before using. Prior to surgery, the user must be fully trained in special skills and must be aware of the risk factors as well as advantages involved with electrosurgical generators.

Remed Co., Ltd. produces reliable products.

- Assembly, expansion, and repair are implemented by a person who is authorized by Remed Co., Ltd.
- Electric installation or other related spots are complied with relevant regulation.
- The equipment must be used in accordance with the manual.

This equipment must be used by a staff that has a professional license related to medical operation or under a supervisor who has completed related training.

Recommended safety measures must be complied for protection of patients.

If other equipment that is not identified in this manual that needs to be connected, it must be notified to Remed or an agency office which is authorized to sell our product.

 This manual and the product may have printing errors or technical defects, and such matters may be subject to correction without notification in advance.

Operation method is explained in this manual for proper use of the equipment. Please re ad this manual carefully and keep it safely placed.

This equipment shall not be transformed, modified, or used for other purpose except for general use.

Remed is not responsible for any profit or loss generated by the use by a person who h as no professional medical related license or staff who has not completed relevant trainin g.

Chapter 1

1. How to use this manual

In this manual…

- This manual has combined contents of **ELPIS-4, ELPIS-3, ELPIS-2** model and the functions are explained in terms of **ELPIS-4** as standard model.
- Description of ELPIS-4 and combined content related to the device is included in this manual and designed in consideration with optimal convenience for users.

- This user manual is constituted with separate chapters and some parts may be explained more than once.

- This manual is made for effective use of ELPIS-4. Please refer to medical references for clinical meaning and pathological effects of this equipments' performance.

- This manual includes explanation about operation method for proper use of the equipment. Please read this manual carefully and keep it preserved.

- Contact Remed or our A/S centers for any problems that occur while using the equipment.

Contents

- The user must read this manual carefully before using the equipment.
- This manual is separated by each chapters as follows:

1.3 Signs and meanings in this manual

- The signs indicate special meanings as described in the box below. Users must follow every warning and caution.
- The manufacturer or representative office is not responsible for any loss or damage caused by product defect due to improper use or negligent management of the product.

Warning ⚠

"Warning" sign means it could cause severe damage, death, physical or financial loss on the patient.

Caution ⚠

"Caution" means it could cause some damage or loss although not deadly risky.

NOTE

"Note" means it is a significant matter of installation, use, and maintenance although not risky.

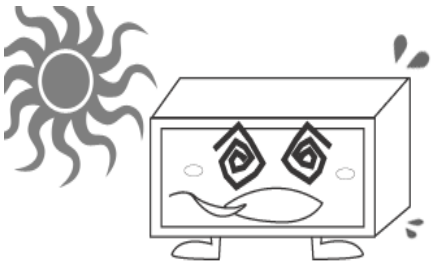
Chapter 2

2. Cautions for use

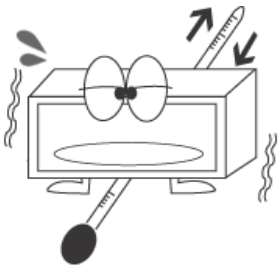
2.1.1 Cautions for use environment

- **Do not use or keep the product under the following environment.**

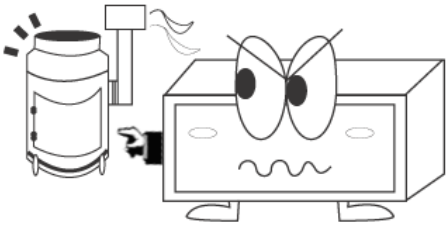
Do not expose to humidity or operate with wet hands



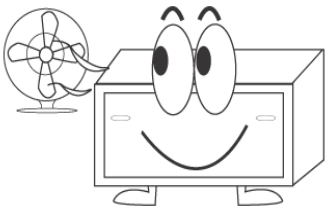
Do not put under direct sunlight



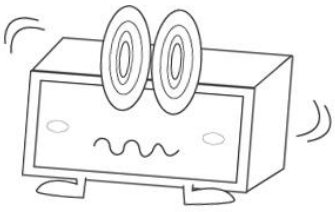
Category temperature range should be 10~40℃, within 30~75% humidity for places with great temperature change.



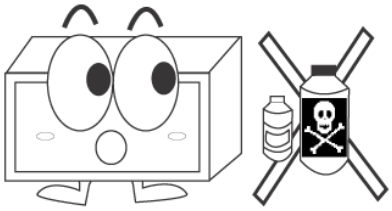
Do not place near a heater



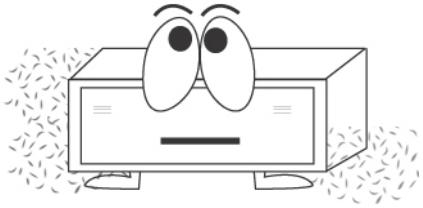
Do not put in a high humidity area or a place with ventilation problem



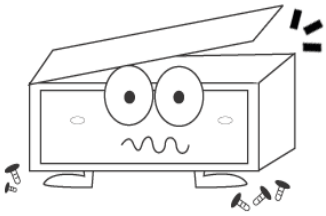
Avoid from strong impact or vibration



Be careful not to expose to chemical material or explosive gas

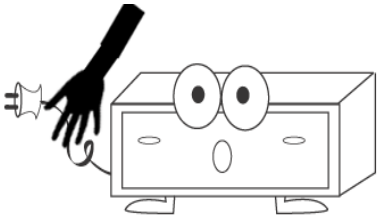


Prevent from dust or metal substances to enter



Do not dismantle or disjoint the equipment. For such case, Remed shall not take responsibility

Do not connect with power before equipment installation is perfectly finished. It may cause damage on the equipment.



Hold the plug tightly when pulling off the power cord

2.1.1 Basic use environment

- Temperature: 10 ~ +40℃
- Humidity: 30~75% RH
- Pressure: 700 ~ 1060hPa

2.1.2 Basic keeping environment

- Temperature: -40 ~ +70℃
- Humidity: 10% RH ~ 90% RH
- Pressure: 500hPa ~ 1060hPa

2.1 Cautions for electric safety

2.1.1 Please check the following matters before using the equipment.

- Check if the power supply line(220-230VAC) is proper with the equipment.
- Check if all connection points (power cord or selective equipments) are properly connected.
- Check if the equipment is perfectly bonded. Refer to chapter 4 for proper connection method.

2.2 Classifications

Protection grade and level for electrical shock	Class 1 device, CF type device
Technical Requirements for Electromagnetic Interference	Class 2 grade A device

NOTE

- **Install the equipment far from generator, X-ray machine, broadcasting device, or moving cable in order to avoid electric noise when using. Independent power circuit and stable maintenance are significant. It is recommended not to share power with other electronic device.**

Warning ⚠

- **This equipment is not proper for use near flammable anesthetic or solvent.**
- **The following materials increase the risk of explosion and/or fire in operating room**
  - **1) Flammable material (such as alcohol)**
  - **2) Spontaneous combustible gas built up in body/organs**
  - **3) When a lot of atmospheric oxygen is distributed**
  - **4) When oxidizing agents are in stand by**
- **Take heed of fire precautions for electrosurgical units can cause explosion from sparks generated from device.**
- **Interference due to high frequency operation can have adverse affect on operation of other electric equipments**

Caution ⚠

- **Do not use parallel with other electronic medical device.**
- **The equipment being installed and operated shall get regular safety inspection by the staff authorized from the manufacturer.**
- **Output power can be inadvertently increased when high frequency surgical unit is damaged.**
- **The equipment must be connected to safely bonded power for electric safety.**
- **Use of mobile phone, radio, portable wireless receiver, or wireless toy is prohibited while equipment is being used.**
- **Be careful not to put oily material or chemicals that can incur risk of device operation near the equipment.**
- **Do not cut a patient return electrode to reduce its size and it should be attached on an optimum area of the properly prepared patient's body.**
- **While using electrosurgery, the patient should not be allowed to come into direct contact with grounded metal objects(ex. Surgical table frame, instrument table, etc). Use extreme caution to maximize patient safety.**
- **Avoid skin-to-skin contact points, such as fingers touching leg, when positioning the patient. To avoid such contacts, dry gauze may be placed between the contact points to ensure that contact does not occur.**
- **Provide as much distance a possible between the electrosurgical generator and other electronic equipment(such as monitors). Do not use needles as monitoring electrodes during electrosurgical procedures as inadvertent electrosurgical burns may result.**
- **Wires should be positioned so that they are not in contact with each other. Any active electrodes that are not in use should be placed in an insulated area away from the patient. For surgical procedures where high current could flow through comparatively small and delicate parts of the body, the use of bipolar techniques may be desirable in order to avoid unwanted tissue damage.**

- **Use the lowest power setting possible for the minimum time necessary that achieves the desired surgical effect.**
- **Never increase the power settings without first checking both the active electrode and the patient return electrode and their connections.**

2.3 Storage and Management after Use

- You can maintain cleanliness of ELPIS-4 through various methods. Use the following methods to avoid damage or contamination of the equipment.
- Wipe the generator with a cloth smeared in alcohol once a month to maintain cleanliness. Make sure no water, alcohol, or any other substances that can cause electrical shock or short circuit enter the equipment.
- Do not soak any part of the equipment with liquids or cleansers. Also, any type of liquids cannot enter the equipment or accessories.

Caution ⚠

- **If any substances (non-approved substances) that can cause damage are used on the product, the product cannot be repaired free of charge even within the warranty period.**

Caution ⚠

- **Carefully check the equipment after cleaning.**
- **Do not use the equipment in case worn out or damaged.**

2.4 Matters that Require Attention during Use

This equipment must be used by a staff that has a professional license related to medica l operation or under a supervisor who completed related training.

- Prior to any surgery, examine and confirm the proper power settings. It is highly recommended to have the power set to its lowest for the shortest time necessary to achieve the desired effect to minimize the possibility of burns.
- Take extreme caution to maximize patient safety by:
  Using the lowest power setting that achieves the desired effect.
  Attaching the patient return electrode as close to the surgical site as possible.
- Always be observing the contact points
- Pediatric applications and/or procedures performed on small anatomic structures require low power settings. The higher the current flow and the longer the current is applied, it is more likely for an unintended thermal damage to tissue resulting in burns, especially on small surface areas.If and when the proper setting is unknown, set the power level to its lowest and cautiously increase the power until the desired effect is achieved.
- Use with extreme caution in the presence of internal or external pacemakers for the electrosurgery interference can cause pacemaker to malfunction and block the pacemaker effect entirely.
- Consult the pacemaker manufacturer or hospital Cardiology Department for further information.
- If the patient has an internal cardiac defibrillator(ICD), contact the ICD manufacturer for instructions prior to operating an electrosurgical procedure.
- Manufacturer of ELPIS-4 does not recommend laparoscopic surgery on pregnant women
- When the apparent output is low or does not properly function even with adequate setup, the neutral electrode is not properly applied and/or contact point is poor. If the case, check to see whether the neutral electrode is applied and properly connected prior to increasing the output power.
- When surgery involves the chest or the head region, combustible/flammable anesthetic or oxidative gas must be absorbed prior to use. If not fully absorbed, the usage must be avoided.

- In case where patients have pacemaker implants or other active inserts, they are exposed to danger as it can affect the pacemakers to malfunction leading to damage. You should always consult a licensed personnel

Caution ⚠

- It is advisable to use bipolar technique to avoid any unwanted tissue damage in surgical procedure that uses high frequency current on comparatively small surfaced body parts.

Chapter 3

3. Summary of ELPIS-4

Summary

This electrosurgical unit is a general surgical device composed of electrosurgical unit, double footswitch, single footswitch, and power cord.

3.1.1 Product description

The ELPIS-4, ELPIS-3, ELPIS-2 is an electrosurgical generator that features different mon opolar and bipolar cutting and monopolar coagulation modes. The maximum output power is 400W/300W/200W, respectively.

On the front side it features a seven segments that display the connection status of acce ssories and peripherals connected to the electrosurgical generator. It is also used to sho w and modify the output settings (e.g. mode, output power, effect). In addition the ELPIS-4, ELPIS-3, ELPIS-2 has a bipolar socket, two monopolar sockets, and a patient plate so cket to connect applicators with instrument recognition. The power switch presses the gen erator on and off. On the rear panel the volume control & speaker, a ventilation hole (FA N), the equipotential bonding point, the AC power socket & power switch and two footswi tch sockets can be found.

Comparison chart;

	ELPIS-2	ELPIS-3	ELPIS-4	ELPIS-4L
Control panel interface	Seven segment modes	Seven segment modes	Seven segment modes	Touch screen panel mode
Rating	220-230 V~, 50/60 Hz, 1 kVA	220-230 V~, 50/60 Hz, 1 kVA	220-230 V~, 50/60 Hz, 1 kVA	220-230 V~, 50/60 Hz, 1 kVA
Using (center) frequency				
Monopolar Cut Pure	400 kHz	400 kHz	400 kHz	400 kHz
Monopolar Cut Blend1	400 kHz	400 kHz	400 kHz	400 kHz
Monopolar Cut Blend2	400 kHz	400 kHz	400 kHz	400 kHz
Monopolar Cut Blend3	400 kHz	400 kHz	400 kHz	400 kHz
Monopolar Soft Coag	-	-	-	400 kHz
Monopolar Coag Contact	400 kHz	400 kHz	400 kHz	-
Monopolar Coag Spray	400 kHz	400 kHz	400 kHz	400 kHz
Biploar Forced Coag	-	-	-	470 kHz
Biploar Coag Soft	470 kHz	470 kHz	470 kHz	470 kHz
Output Mode (Cut)				
Monopolar Cut Pure	200 W, 200 Ω/ 400kHz	300 W, 200 Ω/ 400kHz	400 W, 200 Ω/ 400kHz	400 W, 200 Ω/400 kHz
Monopolar Cut Blend1	150 W, 200 Ω/ 400kHz	230 W, 200 Ω/ 400kHz	250 W, 200 Ω/400 kHz	250 W, 200 Ω/400 kHz
Monopolar Cut Blend2	120 W, 200 Ω/ 400kHz	180 W, 200 Ω/400 kHz	200 W, 200 Ω/400 kHz	200 W, 200 Ω/400 kHz
Monopolar Cut Blend3	100 W, 200 Ω/ 400kHz	120 W, 200 Ω/400 kHz	150 W, 200 Ω/400 kHz	150 W, 200 Ω/400 kHz
Output Mode (Coag)				
Monopolar Contact Coag	100 W, 200 Ω/400 kHz	100 W, 200 Ω/400kHz	120 W, 200 Ω/400kHz	-
Monopolar Soft Coag	-	-	-	120 W, 200 Ω/400 kHz
Monopolar Forced Coag	-	-	-	70 W, 200 Ω/400 kHz
Monopolar Spary Coag	80 W, 200 Ω/400 kHz	80 W, 200 Ω/400kHz	100 W, 200 Ω/400kHz	100 W, 200 Ω/400 kHz
Output Mode (Bipolar)				
Biploar Soft Coag	80 W, 100 Ω/470 kHz	80 W, 100 Ω/470kHz	100 W, 100 Ω/470 kHz	100 W, 100 Ω/470 kHz
Biploar Forced Coag	-	-	-	70 W, 100 Ω/470 kHz

ELPIS-4

		Max.Output setting(watt)	Load resistance(Ohm)	Output Current(A)	Max.Output Voltage rms (V)
Mono polar	Cut Pure	400	200	1.413	282.590
	Cut Blend1	250	200	1.184	236.824
	Cut Blend2	200	200	1.057	211.353
	Cut Blend3	150	200	0.92	184.022
	Coag Contact	120	200	0.798	159.649
	Coag Spray	100	200	0.737	147.354
Bipolar	Coag Soft	100	100	0.952	95.168

ELPIS-3

		Max.Output setting(watt)	Load resistance(Ohm)	Output Current(A)	Max.Output Voltage rms (V)
Mono polar	Cut Pure	300	200	1.289	257.797
	Cut Blend1	230	200	1.124	224.822
	Cut Blend2	180	200	1.057	211.353
	Cut Blend3	120	200	0.988	197.571
	Coag Contact	100	200	0.692	138.439
	Coag Spray	80	200	0.678	135.546
Bipolar	Coag Soft	80	100	0.9	90.000

ELPIS-2

		Max.Output setting(watt)	Load resistance(Ohm)	Output Current(A)	Max.Output Voltage rms (V)
Mono polar	Cut Pure	200	200	1.017	203.441
	Cut Blend1	150	200	0.923	184.615
	Cut Blend2	120	200	0.785	156.943
	Cut Blend3	100	200	0.764	218.194
	Coag Contact	100	200	0.692	138.439
	Coag Spray	80	200	0.676	135.207
Bipolar	Coag Soft	80	100	0.908	90.749

3.1.2 3.1.2 Basic composition

① Electrosurgical Unit (1ea)

② Double Foot Switch (1ea)

③ Single Foot Switch (1ea)

④ Power Cord (1ea)

NOTE

- **As other accessories are not provided from Remed with the purchase of device, purchasing licensed accessories is recommended.**

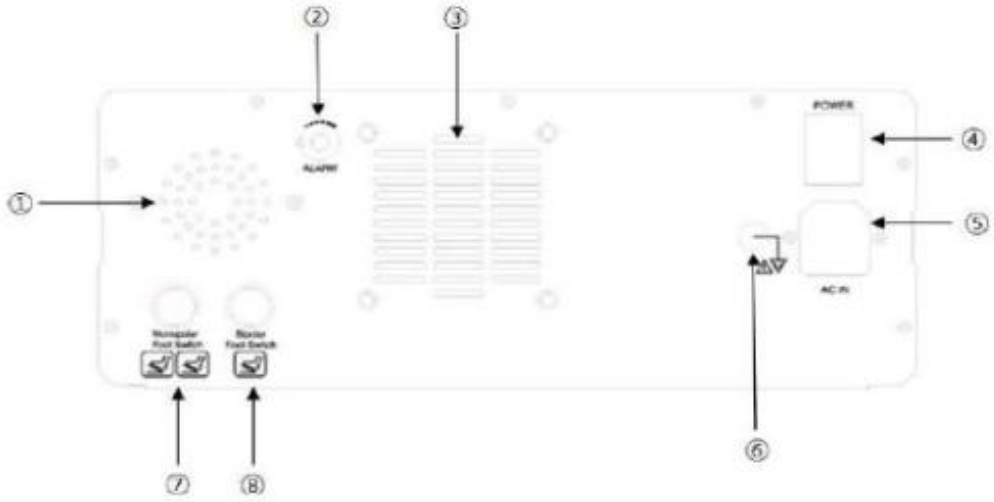
3.2 Exterior and composition

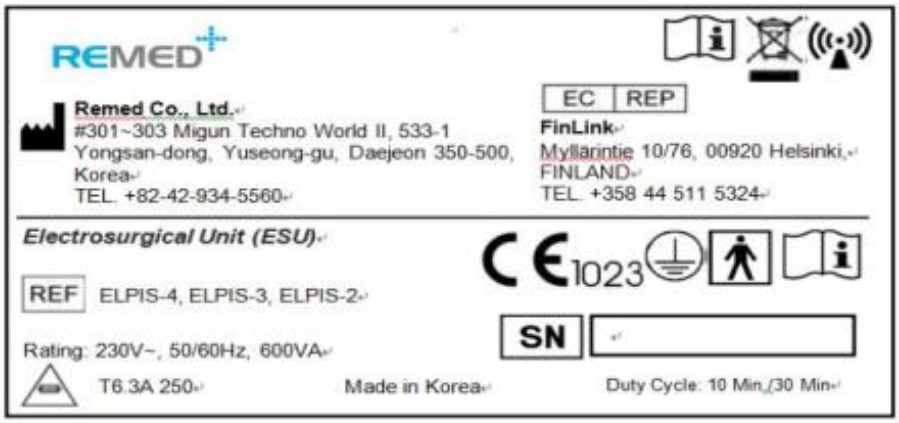
Appearance-ELPIS-4 basis(Front side)

▲ Front of ELPIS-4/3/2

No.	Part	No.	Part
1.	Power switch	11.	Bipolar power digital display
2.	Monopolar cut mode select keys	12.	Bipolar indicator
3.	Monopolar cut select indicator	13.	Monopolar power digital display
4.	Monopolar power adjustment keys	14.	Monoplar coag indicator
5.	Monopolar coag mode select keys	15.	Monopolar cut power digital display
6.	Monopolar coag select indicator	16	Monopolar cut indicator
7.	Mono coag power display	17	Reusable patient plate receptacle
8.	Bipolor mode select key	18	Bipolar accessory receptacle
9.	Bipolar indicator	19	Hand-controlled monopolar accessory receptacle
10.	Bipolar power adjustment keys	20	Combination monopolar, hand-controlled accessory receptacle

3.2.2 Appearance(Back side)





① Speaker
② Speaker volume control
③ Fan
④ Power switch
⑤ Power inlet
⑥ Equipotential ground connector
⑦ Monopolar footswitch connector
⑧ Bipolar footswitch connector

3.3 Voltage and usage for accessories

Products	Voltage	Usage
Bipolar foot switch	220-230V	
Monopolar foot switch	220-230V	

3.3 Accessory

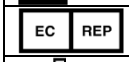
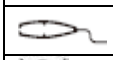
[Power cable]

[Monopolar footswitch]

[Bipolar footswitch]

3.4 symbols

Refer to the following table for descriptions of sybmols.

Symbols	
	MANUFACTURER
	AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY
	Date of manufacturer
	Serial number
	Consult instruction for use
	Catalogue Number
	See instruction for use
	Protective earth (ground)
	Equipotentiality
	“ON/OFF” (power)
	Type BF Applied Part
	Non-ionizing Radiation
	Volume Control
	Fuse Enclosed
	Footswitch Input Jack
	Monopolar Handpiece Receptacle
	Biopolar Handpiece Receptacle
	Do not dispose of this device in the unsorted municipal waste stream.
	Cut Mode
	Coag Mode
	Bioplar Mode
	Return electrode receptacle
	Caution High voltage
	Defibrilator proof type CF Equipment
	RF isolated-patient connections are isolated from earth at high
	Monopolar Cut mode select key
	Monopolar Blend 1 mode select key
	Monopolar Blend 2 mode select key
	Monopolar Blend 3 mode select key
	Monopolar power adjustment key(up)
	Monopolar power adjustment key(down)
	Monopolar Coag/Bipolar Coag power adjustment key(up)

	Monopolar Coag/Bipolar Coag power adjustment key(down)
	Monopolar Contact key
	Monopolar Spray key
	Bipolar Hand key
	Bipolar Foot key

3.4 Instrument compatibility

Refer to the following table in the Appendix to confirm that this electrosurgical unit is co mpatible with the ancillary equipment being used.

Using incompatible equipment can result in patient injury and/or equipment damage.

Instruments	Modle/type	Manufacturer	Single use/Reusable
Twin button handle	Pro pencil(rocker)	Atos Medical	Reusable
Disposable return plate	Pro plate(p9752)	Atos Medical	Single use
Bipolar forceps	Baynot 17.8cm	Tecno	Single use
Bipolar cable	2 pin plug, 3m, Rated Voltage(Umax): 1000Vpp	Tecno	Reusable
Electrode tips	Knife 2.4*70mm	Tecno	Single use
	Needle 2.4*70mm		
	Needle(angled) 2.4*70mm		
	Ball 5mm		
	Loop 6mm		
Monopolar handle	Cable 3m, Rated Voltage(Umax) : 3000Vpp	Tecno	Reusable
Single foot switch	one pedal foot switch B1	Winfull Industry	Reusable
Double foot switch	two pedal foot switch B2	Winfull Industry	Reusable
Silicon rubber plate & cable	240*150mm, Cable 3m, Rated Voltage (Umax) : 3000Vpp	Honesmed	Reusable

Note: To avoid incompatibility and unsafe operation, use suitable cables, accessories, acti ve and neutral electrodes

Chapter 4

4. Installation method of ELPIS-4

4.1 Installation

Be aware of the following matters when installing ELPIS-4

- Use the ELPIS-4 in 10℃ - 40℃ temperature within 30~70% of humidity.
- Check the status of power cord connection.
- Do not put many cords into a single electric consent.
- Place the main body on a flat position.
- Do not forget to use a bonding cable.
- Do not use a power cable that generates connection noise.
- Be careful not to damage it from impact.
- Install in consideration with surrounding temperature and humidity and keep away from dust or flammable material.

Power connection

- Connect the power cord to the power inlet at the back of the generator
- Connect the power cord that's connected to the generator to the electrical outlet
- Orange lamp flickers for 10sec. and stays indicated when system switch at the b ack of the generator is turned on.
- When power switch is pressed and hold for 2sec. lamp turns to green and powe r is switched on.

Before using ELPIS-4

- Prior to using the device, device and accessory connection must be thoroughly checked.
- All the accessories must be checked for proper function
- When accessories are not properly connected, sparks can be generated and cause malfunction leading to inadvertent injuries.
- Do not connect wet accessories to the generator for it can cause risk of electric shock.
- Surgical instruments and accessories must be connected to the proper receptacles. Otherwise it can cause malfunction or lead to dangerous situations. Carefully read the manual for proper use.
- All accessories must be properly connected to avoid risk of electric shock from exposed metallic parts.
- Refer to manual that's included in the accessories for detailed explanation of accessories that are not mentioned in this manual.
- Prior to testing the accessories, set the power output to its lowest
- Check the status of the cord as well as accessories before using electrosurgical unit. Electric shock can occur if damaged cord is used.
- Accessories marked "disposable" should not be sterilized for reuse.

Chapter 5

5. How to use ELPIS-4

5.1 Preparation before using the equipment

① Connect the monopolar footswitch to the proper inlet at the back of the generato r.

② Connect the bipolar footswitch to the proper inlet at the back of the generator.

③ Either reusable Silicone Patient Plate or Disposable Patient Return Plate can be used at a time, but not both. Connect only 1 pad to its proper receptacle.

④ When using monopolar/bipolar, adjust to moderate power settings.

⑤ When testing monopolar/bipolar, footswitch, patient return plate, set the power to its lowest.

5.1.1 Use Method and Operation Steps

1. Connect the power cord at the back of the device.
2. Turn the device on using the power switch located bottom left at the front of the device.
3. Check for indications on the display and make sure LED flickers and alarm s ounds for REM(return electrode monitoring)
4. Choose the mode preferred to use(cut/blend/coag/etc) and press up/down arr ow button to select desired output.
5. When in need of using footswitch, connect its cable to the connector at the back of the device.
6. When using monopolar, attach the patient return plate to the patient.
7. To activate the device, press the button on the handpiece or press down on the footswitch.

5.2 How to use MONOPOLAR CUT

1) Display & method for connecting accessories

. Connect the monopolar footswitch to the monopolar inlet at the back.

. Connect monopolar handle which is purchased separately to ① receptacle.

. Connect monopolar twin button which is purchased separately to ② receptacle.

Connect either Reusable Silicone Patient Plate or Disposable Patient Return Plate to ③ receptacle.

. Adjust power level using ⑤ up/down arrows.

. Choose from modes “PURE, BLEND 1, BLEND 2, BLEND 3” by pressing ⑥ mode icon.

[Pic] Monopolar receptacles

2) How to use ① monopolar handle receptacle

. Connect monopolar handle which is purchased separately to ① receptacle.

. Set proper power level using ⑤ up/down arrows.

. Choose mode “PURE, Blend1~3” by pressing ⑥ mode icon.

Connect the patient return plate to ③ receptacle. The pad should be attached to the surgical site as close as possible.

Make sure the ④ red lamp is on. If it flickers, the pad is not properly attached and should be reattached until it no longer flickers

Step on monopolar footswitch to operate monopolar handle.

. When footswitch is pressed for operation, alarm will sound and lamp lights up for monopolar and power set output is generated.

3) How to use ② monopolar twin handle receptacle

. Connect monopolar twin button handle which is purchased separately to ② receptacle.

. Adjust power level using ⑤ up/down arrows.

. Choose mode “PURE, Blend1~3” by pressing ⑥ mode icon.

. Connect the patient return plate to ③ receptacle. The pad should be attached to the surgical site as close as possible.

Make sure the ④ red lamp is on. If it flickers, the pad is not properly attached and should be reattached until it no longer flickers

When yellow button is pressed for operation, alarm will sound and lamp lights up for monopolar and power set output is generated.

5.2 How to use MONOPOLAR COAG

1) Display & method for connecting accessories

. Connect the monopolar footswitch to the monopolar inlet at the back.

. Connect monopolar handle which is purchased separately to ① receptacle.

. Connect monopolar twin button which is purchased separately to ② receptacle.

. Connect either Reusable Silicone Patient Plate or Disposable Patient Return Plate to the ③ receptacle.

. Adjust power level using ⑤ up/down arrows.

Choose from modes “CONTACT COAG, SPRAY COAG” by pressing ⑥ mode icon.

[Pic.] Monopolar coagulation receptacle

2) How to use ① monopolar handle receptacle

Connect monopolar handle which is purchased separately to ① receptacle.

. Connect the patient return plate to ③ receptacle. The pad should be attached to the surgical site as close as possible.

. Set proper power level using ⑤ up/down arrows.

. Choose mode “Contact Coag, Spray Coag” by pressing ⑥ mode icon.

Make sure the ④ red lamp is on. If it flickers, the pad is not properly attached and should be reattached until green light is indicated.

. Step on monopolar footswitch to operate monopolar handle.

. When footswitch is pressed for operation, alarm will sound and lamp lights up for monopolar coag. and power set output is generated.

3) How to use ② monopolar twin handle receptacle

. Connect monopolar twin button handle which is purchased separately to ② receptacle.

. Connect the patient return plate to ③ receptacle. The pad should be attached to the surgical site as close as possible.

Adjust power level using ⑤ up/down arrows.

. Choose mode “Contact Coag, Spray Coag” by pressing ⑥ mode icon.

Make sure the ④ red lamp is on. If it flickers, the pad is not properly attached and should be reattached until green light is indicated.

When green button in the twin handle is pressed for operation, alarm will sound and lamp lights up for monopolar coag. and power set output is generated.

5.2 How to use BIPOLAR COAG

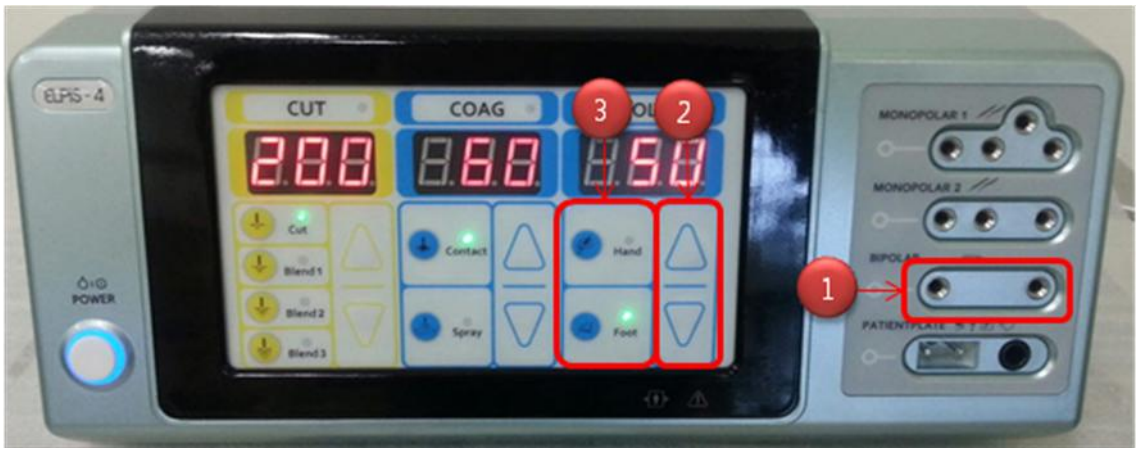
1) Display & method of connecting accessories

. Connect the bipolar footswitch to the receptacle at the back of the generator

. Connect bipolar handle to ① receptacle.

. Adjust power level using ② up/down arrows.

. Choose from modes "HAND, FOOT" by pressing ③ mode button.



[Pic.] Bipolar coagulation receptacle

2) How to use BIPOLAR COAG

. Connect bipolar forcep which is purchased separately to ① receptacle.

Adjust power level using ② up/down arrows.

. Choose from modes "HAND, FOOT" by pressing ③ mode button.

.

If you desire HAND mode operation, press the hand switch button and when forcep is in contact with the surgical site, alarm will sound and lamp lights up for bipolar coag. and power set output is generated.

If you desire FOOT mode operation, press the footswitch button and step on the bipolar foot switch, alarm will sound and lamp lights up for bipolar coag. and power set output is generated.

Caution

- **Accessory**
  - **Any metallic instruments that electric currents could flow should not be wrapped in cords.**
  - **When above mentioned is the case, surgical team during an operation can be electrocuted, shocked and/or burned.**
- **Pad**
  - **To prevent inadvertent burns, the pad should be attached properly according to the patient's body contour.**
  - **When patient has been repositioned during the surgery, the pad must be checked for proper attachment.**
  - **The pad should be checked for proper attachment during a long surgery.**
- **Switching mode**
  - **Consult a surgeon/physician for choosing mode required for surgery**
  - **Check if the mode is actually displayed as the mode intended to be changed.**
- **Switching power level**
  - **Confirm the power level and familiarize yourself with the surgical site**
  - **Power should be set to lowest output and use properly on required site.**
  - **When increasing power, make sure pad is properly attached and check cord connection.**
  - **It is necessary to set the power to its lowest to prevent from inadvertent burns.**
- **Foot switch**
  - **Foot switch should be used for bipolar electrode operation.**

Caution

- **Alarm will sound for the following situations:**
  - **When pad is not connected or properly connected to the generator during monopolar surgery**
  - **When pad is not properly connected to the patient.**
  - **When pad is not fully attached to the patient, adhesiveness loses its stickiness, liquid is present in attachment, or gel dries out.**
  - **When resistance increases due to overload from damaged connected pad cord.**

Chapter 6

6. Product Specification

6.1 Physical Specification

Rated Voltage	AC 220V
Rated Frequency	60Hz
Power Consumption	600VA +/-10%
Fuse	T10AH when AC220V or T6.3AL
Protection class	Class 1, Type BF
Carrier Frequency	400kHz, 470kHz
Repeat Frequency	33kHz
Weight	20kg
Operation temperature	10℃ to 40℃
Storage temperature	-20℃ to 60℃
Humidity	20% to 95% RH
Operation altitude	700mbar ~1060mbar
Operation Cycle	10sec ON 30sec Idle
Cooling	1 inner Fan

- Size(LxWxH)

  325mm x 411mm x 137mm

- Weight

  Approx. 10.32kg –

Electrical Specifications

Power Consumption: Max 600[VA](Power: Single phase AC 220-230V, 50/60Hz)

6.2 Output Power

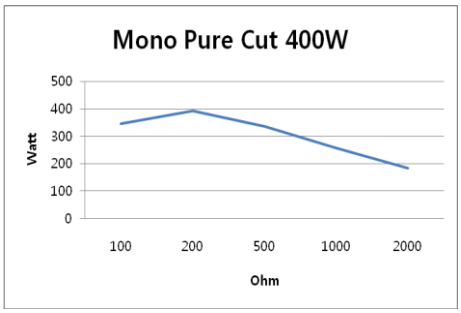
Mode	Output power	Carrier Frequency	Crest Factors	Duty Rate	Repeat Frequency
Pure Cut	400W at 200ohm	400kHz	1.6	100%	Continuous
Blend1	250W at 200ohm	400kHz	2	80%	33kHz
Blend2	200W at 200ohm	400kHz	2.2	60%	33kHz
Blend3	150W at 200ohm	400kHz	2.4	50%	33kHz
Coag Soft	120W at 200ohm	33k~150kHz	3.3~1.5	100%	Pulse modulated
Coag Spray	100W at 200ohm	400kHz	4.5	8.00%	33kHz
Bipolar Coag Soft	100W at 100ohm	470kHz	1.5	100%	Continuous

6.3 Standard Output Table by Surgery Part

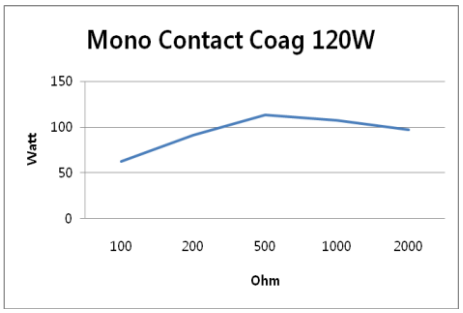
Part	Cut Mode	Cut Power(W)	Coagulation Mode	Coagulation Power(W)	Bipolar coag
Skin Incision	Pure or Blend1	10~120 8~100			
Muscle Dessection	Pure or Blend1	Above 15 Above 15			
Tumor Excision	Blend2 Blend3	15~80 15~70	Spray	10~15	
Stomach Intestine resection	Blend2 or Blend3	20 and Up 20 and Up			
Hemostasis			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	Spray 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	

Output Power vs. Resistance Graphs [ELPIS -4]

- Mono Pure Cut

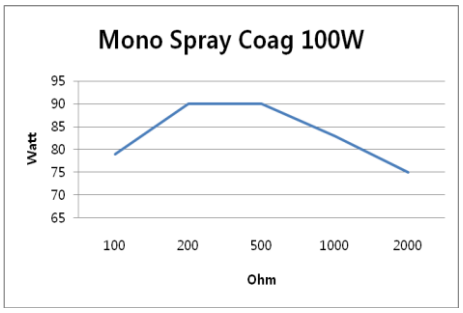


- Mono Contact Coag

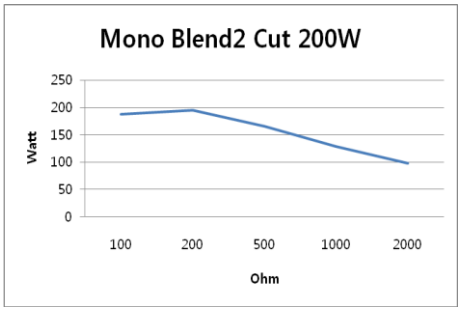


- Mono Blend 1 Cut

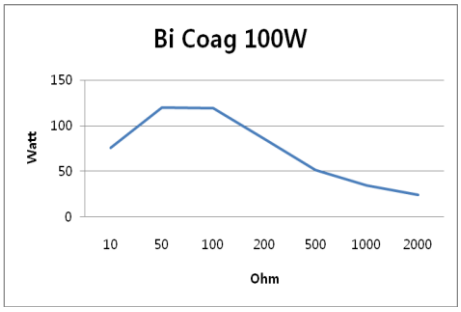
- Mono Spray Coag



- Mono Blend 2 Cut



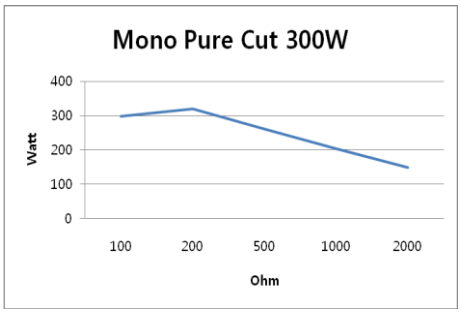
- Bi Coag



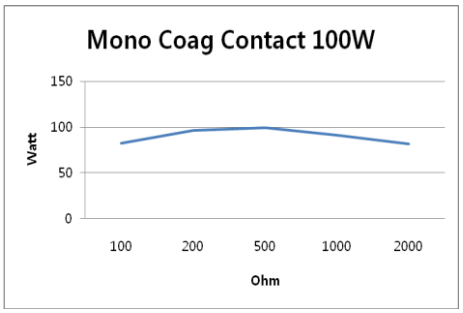
- Mono Blend 3 Cut

Output Power vs. Resistance Graphs [ELPIS -3]

- Mono Pure Cut

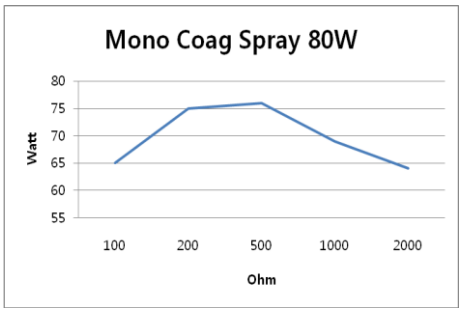


- Mono Contact Coag



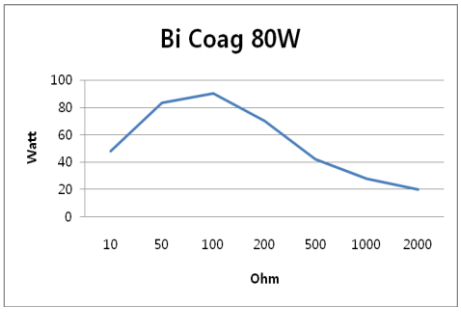
- Mono Blend 1 Cut

- Mono Spray Coag

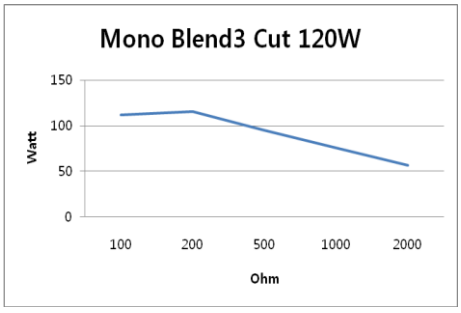


- Mono Blend 2 Cut

- Bi Coag

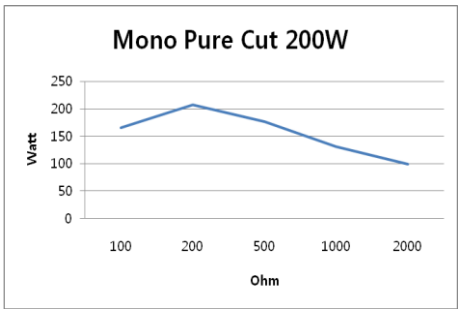


- Mono Blend 3 Cut

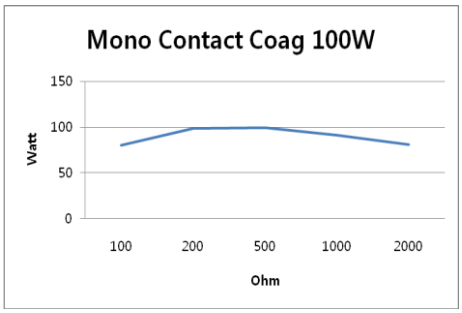


Output Power vs. Resistance Graphs [ELPIS -2]

- Mono Pure Cut

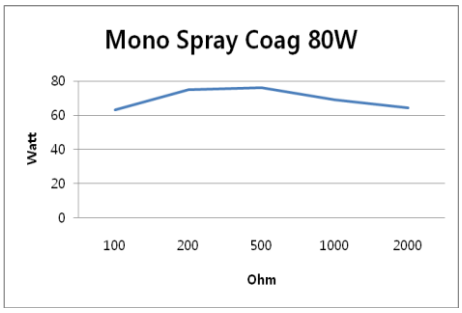


- Mono Contact Coag

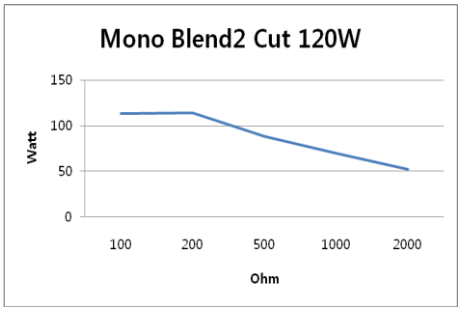


- Mono Blend 1 Cut

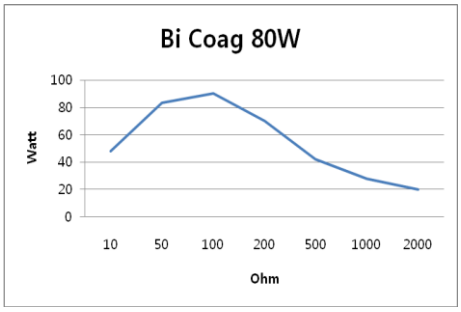
- Mono Spray Coag



- Mono Blend 2 Cut



- Bi Coag



- Mono Blend 3 Cut

Chapter 7

7. Solutions to Simple Problems

Here are some ways to solve simple problems occur while using the equipment. Sometimes the equipment does not operate as desired. When this happens, check the following lists before regarding it as 'malfunction.'

7.1 The control panel LED is not lighted/displayed even after pressing power switch.

➔ Check if the power consent is properly inserted.

➔ Check if the power switch is ON at the back.

➔ Check if power switch is pressed for more than 2sec.

7.2 Stop using the device and immediately call our service center when the following occurs.

➔ When icon does not respond to touch senses while operating device.

➔ When there's no output or no changes to output level while operating device.

➔ When there's no display on monitor even after Power switch/button has been pressed/turned on.

Please contact our customer support department or A/S center for break down or repair.

Chapter 8

8. Warranty Period

- This product is made through strict quality control and inspection process of our co mpany. Warranty standard for repair or exchange comply with “Regulation on compe nsation for customer damage’ declared by the Economic Planning Board.

- Warranty period for this period is regulated as one(1) year.
- Free of charge warranty is provided by our service center for a defect occurs under normal operational condition.
- Please let us know the model name, equipment number, date of purchase, and defe ct matters when a problem occurs during warranty period.

Chapter 9

9 Service Inquiry

Only our customer support department or authorized personnel may provide Remed service for the product. The warranty period is nullified if unauthorized person repair or tries to repair the equipment even though within the warranty period.

Customer support department of Remed Co., Ltd. or an authorized agency are obligated to provide the service that customer demands for.

Immediate and full maintenance must be implemented if the equipment may have a risk of defect or give harm to human body at a hospital or any other place this equipment is used.

Conduct the following if a defect occurs with the equipment.

- Please immediately call our customer support department or our agency.
- Check the model name, product serial number; date of purchase, and problem or inquiries before call us.
- We will solve the problem on the phone if possible, or immediately visit the site if necessary.

9. Standard and IEC Classifications

Class I Equipment (IEC 60601-1)

Accessible conductive parts cannot become live in the event of a basic insulation failure because of the way in which they are connected to the protective earth conductor.

Type BF Equipment (IEC 60601-1) / Defibrillator Proof

The ELPIS-4, ELPIS-3, ELPIS-2 provides a high degree of protection against electric shock, particularly regarding allowable leakage currents. It is type BF equipment. Patient connections are isolated from earth and resist the effects of defibrillator discharge.

Drip Proof (IEC 60601-2-2)

The generator enclosure is constructed so that liquid spillage in normal use does not wet electrical insulation or other components which, when wet, are likely to affect adversely the safety of the generator.

Electromagnetic Interference

When other equipment is placed on or beneath an activated ELPIS-4L, ELPIS-3, ELPIS-2, the unit can be activated without interference. The generator minimizes electromagnetic interference to video equipment used in the operating room.

Electromagnetic Compatibility (IEC 60601-1-2 and IEC 60601-2-2)

The ELPIS-4, ELPIS-3, ELPIS-2, complies with the appropriate IEC 60601-1-2 and IEC 60601-2-2 specifications regarding electromagnetic compatibility.

Chapter 10

Contact us

Please contact us with the following number to get various services and products. You may also contact our sales department.

Product purchase & Technical support

Remed Co., Ltd.

Headquarters 301~303, Migun Techno World II, 187, Techno 2-ro, Yuseong-gu, Daejeon 305-500, Korea

Phone : +82-42-934-5560~1 Fax: +82-42-934-5562

Sales/R&D : (4F, Samjeon-dong), 224, Baegjegobunro, songpa-gu, Seoul, Korea

Phone : +82-1588-7395 Fax: +82-2-418-0986

∗ Please check the model name, serial number, and problems before calling about equipment break down.

∗ Please call for technical matters about the equipment.

European Representative

EC REP

FINLINK

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