J-470
ELECTROSURGE
Radio Frequency
Electrosurgery Unit

Operation Instructions
ELECTROSURGE J-470

- Power
- Foot Switch
- Electrodes
- Waveform Mode
- Intensity Level
- Indifferent Plate (antenna)

RF Light
Hand Piece Jack
Indifferent Plate Jack
Straight Hand Piece
JORVET ELECTROSURGE

Radio Frequency
Electrosurgical Unit

Radio Frequency
What is electrosurgery?

Electrosurgery is a commonly used procedure that has been used in both human and veterinary surgery for over 20 years. Ultra high frequency radio waves are transmitted through a fine wire electrode to a flat antenna on a ground plate placed under the animal. The high frequency radio waves pass through tissue and make a precise surgical incision just like a scalpel blade. The surgeon chooses from varying radio waveforms that result in varying degrees of pure cutting to hemostasis. Radio frequency electrosurgery should not be confused with electro cautery. Electro cautery uses thermal energy or heat that simply burns the tissue.

The advantages of electrosurgery are fine, precise incisions with hemostasis of small “bleeders.” A key advantage is less blood obstructing the surgical field. This makes any procedure faster and easier.
What Do The Dial Settings Refer To?

The two dials on the front panel refer to Fig. 1 waveform mode and power intensity. The waveform mode has different settings. This dial allows the selective use of various waveforms that give varying degrees of cutting power and hemostasis.

**Cut mode:**
This gives a fully filtered wave of continuous high frequency waves. The fully filtered wave allows a constant non-pulsating waveform that provides smooth cutting power. This produces the least amount of lateral heat and tissue damage. This is the preferred mode for thin avian skin and incisions where heavy bleeding is not a problem. This mode provides for the least amount of hemostasis.

**Coag 1 mode:**
This selection produces a full rectified wave. This waveform has less cutting power, but coagulation of small capillary beds is achieved.

**Coag 2 mode:**
Partially rectified wave. This provides the most hemostasis on vessels up to 1/16” in diameter. This mode can also use the indirect method of coagulation. This method employs a fine hemostat to grasp the vessel cleanly. The active electrode can touch the hemostat near the tip and coagulate that vessel.
Getting Started

Remove the unit from box and lay it on a flat surface.

1) Connect the female end of the power cord to the rear of the unit and the other 3 pronged end in a grounded electrical outlet.

2) Black surgery hand piece. The male jack is inserted into the unit by the area marked hand piece on the front panel.

3) Antenna or indifferent plate: This is the red cord. The male jack should be inserted into the red female jack opening mark indifferent plate on the front panel.
   
   **WARNING:** Be sure to match the right color: Antenna to red. Surgery hand piece to black.

4) Foot Pedal: connect the male connector to rear of unit.

5) The antenna plate should be placed under the animal close to the operating site. It does not have to be moist or wet to work.

6) Select an electrode and insert the straight shaft end into the top of opening of the straight hand piece. You can enlarge this opening by turning the top portion of hand piece counterclockwise. Do not unscrew the hand piece near where the wire attaches to it.

   Once the electrode is in place, it can be locked by tightening the very top portion of the hand piece clockwise. Do not over tighten. The top portion may continue turning even after the electrode is on tight. Care should be taken not to strip these threads.

7) Set the waveform dial to desired mode.

8) Select the power intensity by adjusting the power intensity. 1 is lowest and 10 is highest. Start at the minimum level and seek a setting where cutting is smooth but no sparks are emitted.

9) The red light below the 2mHz should light when the foot pedal is depressed. This indicates that radio frequency waves are being sent.

10) The electrode should be gently held on the tissue. A smooth, constant motion will produce less lateral heat and the cleanest incision. The tissue should always be kept moist for better and cleaner cutting. Cutting should be without pressure. Too much pressure can damage the electrode tip.
Practice

It is highly recommended to practice your technique before using the unit on clinical cases. There are a number of text books available on electrosurgery. The wide range of applications can be found by reading through one of these texts.

1) Obtain a fresh lean cut of beef, such as round or sirloin steak. The meat should reach room temperature. Moisten the meat with a small amount of saline.

2) Set up the unit and place the meat on top of the antenna plate.

3) Select an electrode and place in hand piece.

4) Turn waveform mode to coag 2.

5) Put power level at #8 position.

6) Press on the foot pedal.

7) Do several incisions and observe the results. This high setting will cause sparking and may char tissue.

8) Adjust power to #1. This will illustrate poor cutting or extreme drag.

9) Move the power setting to different levels and continue to practice.

10) Try different waveform settings, but wait 10 seconds between adjustments. The more you practice the easier the unit will perform for you on actual patients.

Tip: The cutting should be smooth with no sparking or resistance.
Cutting

The tissue should always be moist. Dry tissue can result in surface charring. Saline solutions are the best solution to use. Cutting involves no pressure. The hand should rest on a support in order to keep control over the hand piece. Remember to use a feather light touch.

Hemostasis

Small bleeders can easily be stopped with an electrosurgery unit. The vessel should have direct pressure first placed on a sponge or hemostat. The vessel should be clearly located and not covered with blood. The waveform should be in coag 1 or coag 2. Coag 2 is preferred for larger bleeders. The two types of coagulation electrodes are the round ball electrodes and heavier needle. An indirect method uses a hemostat with a fine tip. The vessel is grasped by the hemostat. The electrode is applied to the hemostat about 1” from its end.

Care and Selection of Electrodes

The electrodes can be autoclaved or cold sterilized. The protective rubber on the shaft should be intact. If it is cracked or worn a shock or burn may be felt by the operator. Autoclaving will affect the rubber sleeve over time.

*NOTE:* Always clean off electrode after use with a gentle disinfectant.

Electrode Type

There are literally hundreds of different styles of electrodes available from various manufacturers. The JorVet Electrode is the industry standard 1/16” shank. Other manufacturer’s electrodes will work on the JorVet unit.
Electrode Styles

**Ball end:** These are best for hemostasis purposes.

**Loop end:** These electrodes work nicely with skin tumors or gingival hyperplasia. The loop encircles and slices through tissue. Circle and diamond loop configurations are available.

**Straight:** Thin wires work well on cutting. The heavier wires work well for hemostasis.

Ordering additional electrodes available in packages of two. J-470D (T#).
Cautions

1) Radio frequency can interfere with heart pacemakers. Consult a physician before exposing anyone wearing a pacemaker to radio frequency waves.

2) Various ECG and monitoring equipment can be affected by radio frequency waves. Place these items as far away from the antenna plate as possible.

3) When changing electrodes do not have the foot pedal depressed.

4) Electrosurgery can give off sparks and ignite flammable liquids or gases.

5) Electrosurgery still requires anesthesia or analgesia.

6) The operator can inflict wounds, burns, or shocks to themselves by inappropriate use. Just as misuse of a scalpel can cut you, so can misuse of electrosurgery units.

Trouble Shooting

1) Before starting make sure all connections are correct. Red jack into Red outlet: Indifferent plate outlet.

2) This unit can heat up with heavy use. A small fan at the rear of the unit should always be running when the power is on.

3) Too much spark: Adjust power down by 2 positions.

4) Will not cut:
   a) Is the power light on?
   b) Foot pedal connected?
   c) RF red light on when foot pedal is depressed?
   d) Electrode properly attached?
   e) Antenna plate attached and in close proximity?
Specifications

- Catalog J-470
- 110 volt (available in 220v)
- Output power: 100 watts
- Output frequency: 2.0 mHz
- Size: Height: 3”
  Width: 1 ½”
  Depth: 7 ¾”
  Weight: 7 ½ lbs.
- Replacement fuse: 250 A

LIMITED WARRANTY

The Electrosurge is under warranty for a period of 18 months against defects in workmanship and materials. Electrodes are not covered under warranty. The Warranty Card must be returned to Jorgensen Laboratories, Inc. within 14 days of purchase.