

Incoming Clinical/Biomedical Check/Verification for ERBE ElectroSurgical Units (ESUs/Generators)



We would like to welcome you to the ERBE family. ERBE Elektromedizin GmbH is the “Oldest and Largest Electrosurgical Company in the World” outside the USA. Please see the below “Intelligent Cut and Coagulation (ICC) / Variable Cut and Coagulation (VIO) Systems Output” chart to check and verify that the outputs are within specifications. Also, there is a brief explanation involving the technologies and specifically the “Constant Voltage Principle” to assist you in using your output testing equipment.

If you have any concerns or questions, please call the Technical Service staff. We are accessible 24 hours a day, 7 days a week for your support at 800-778-3723.

ICC / VIO System Outputs

ICC Settings Note: Unless otherwise specified.	ICC Model Series Outputs			ICC 80 Model Settings and Output	VIO 100 C Model Settings and Output	VIO 200 S Model Settings and Output	VIO 300 S Model Settings and Output	VIO 300 D Model Settings and Output
	ICC 200	ICC 300	ICC 350					
Cut, Effect 4, 500 Ohms, Range $\pm 10\%$	200 Watts	300 Watts	300 Watts	Cut, Effect 1, 500 Ohms, 80 Watts, Range $\pm 10\%$	Auto Cut, 500 Ohms, 100 Watts Range $\pm 20\%$	Auto Cut, Effect 8, 500 Ohms, 200 Watts Range $\pm 20\%$	Auto Cut, Effect 8, 500 Ohms, 300 Watts Range $\pm 20\%$	Auto Cut, Effect 8, 500 Ohms, 300 Watts Range $\pm 20\%$
Soft Coag, 125 Ohms, Range $\pm 15\%$	120 Watts	120 Watts	120 Watts	Soft Coag, 200 Ohms, 50 Watts, Range $\pm 10\%$	Dry Cut, 500 Ohms, 100 Watts Range $\pm 20\%$	Soft Coag, 50 Ohms, 120 Watts Range $\pm 20\%$	Dry Cut, Effect 8, 500 Ohms, 200 Watts Range $\pm 20\%$	Dry Cut, Effect 8, 500 Ohms, 200 Watts Range $\pm 20\%$
Forced Coag, 350 Ohms, Range $\pm 15\%$	120 Watts	120 Watts	120 Watts	Forced Coag, 500 Ohms, 50 Watts, Range $\pm 10\%$	Soft Coag, 100 Ohms, 80 Watts Range $\pm 20\%$	Forced Coag, Effect 4, 500 Ohms, 120 Watts Range $\pm 20\%$	Forced Coag, Effect 4, 500 Ohms, 120 Watts Range $\pm 20\%$	Forced Coag, Effect 4, 500 Ohms, 120 Watts Range $\pm 20\%$
Spray Coag, 500 Ohms, Range $\pm 15\%$	99 Watts*	120 Watts	120 Watts	Not Applicable (N/A)	Forced Coag, 500 Ohms, 50 Watts Range $\pm 20\%$	N/A	Spray Coag, Effect 2, 500 Ohms, 120 Watts Range $\pm 20\%$	Spray Coag, Effect 2, 500 Ohms, 120 Watts Range $\pm 20\%$
Bipolar Coag, 125 Ohms, Range $\pm 15\%$	120 Watts	120 Watts	120 Watts	Bipolar Coag, 200 Ohms, 50 Watts, Range $\pm 10\%$	Bipolar Soft Coag, 100 Ohms, 80 Watts Range $\pm 20\%$	Bipolar Soft Coag, Effect 8, 75 Ohms, 120 Watts Range $\pm 20\%$	Bipolar Soft Coag, Effect 8, 75 Ohms, 120 Watts Range $\pm 20\%$	Bipolar Forced Coag, Effect 2, 200 Ohms, 90 Watts Range $\pm 20\%$
Cut “B” (Bipolar) Program, Effect 4, 500 Ohms, Range $\pm 10\%$	N/A	N/A	100 Watts	N/A	N/A	N/A	N/A	N/A

* Only ICC 200 E/A in “A” Mode

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ICC Technology

Unlike conventional electrosurgical generators, the ERBE ESU ICC Models operate on a "Constant Voltage Principle". Conventional generators allow voltage surges and constant wattage no matter what type of tissue is encountered. The ERBE ICC ESU has an inherent capability to maintain constant voltage (i.e. no surging as well as varying wattage according to tissue resistance). To help with your incoming safety and performance testing of the ERBE ESU, please follow the simple suggestions below.

The "Forced" and "Spray" settings operate similar to the conventional generator. The output power can be measured with a defined load resistance of 350 Ohms (Ω) for "Forced" coagulation and 500 Ω for "Spray" coagulation. The output power reading on your analyzer should be within the specified percentage (%) of the power setting on the generator.

When measuring the "Cut" output, a load resistance of 200 Ω or less should be used. This will enable you to test across the entire range of power. As stated above, the ERBE generator will deliver the amount of output power according to the resistance applied.

Low Resistance = High Power / High Resistance = Low Power

For example, a power setting of Cut, Effect 1 at 300 Watts, with a load resistance of 300 Ω will get only a reading of $\approx$ 125 Watts because the voltage, which in this case would have a peak of 250 VRMS, would limit the power. In order to deliver 300 Watts on the Cut Effect 1 setting, the resistance would have to be 208 Ω or lower.

Please also keep in mind that when testing the output "Cut" power with a load resistance of 200 Ω or lower and a power setting of 10 Watts, it will produce an output error alarm on the generator. This will occur because the voltage drop would be too great. For instance, a power setting of 5 Watts and a resistance of 200 Ω will create a voltage drop of 32 Volts which will cause the Unit to produce an output error alarm. It would be impossible to make a "Cut" with such low voltage. Furthermore, a physician would not consider any surgical application at this inadequate setting.

For "Soft" and "Bipolar" settings, the resistance has to be even lower in order to be able to measure the entire range as the voltage is always going to be below the voltage associated with the "Cut" setting. A load resistance of 75 Ω is recommended in this case.

VIO Technology

The VIO series generator also incorporates the "constant voltage principle" into its design. The VIO has a sophisticated software controller monitoring the power, voltage, and current delivery. Follow the above testing guidelines.