



**RIGEL MEDICAL**

GMC-INSTRUMENTS GROUP

## How to test electrosurgical units?

Performance testing of electrosurgical units (ESUs) relies predominantly on three crucial tests.

HF Power tests measure the output current, voltage, wattage and crest factor using a series of variable loads. Checks are almost always carried out on available modes and maximum power. The performance schedule from the manufacturer will state which loads are required, plus any additional power levels. Specifications for output power are usually around +/-10%.

Modern ESU analysers have built in variable load resistances with automated power test procedures. An ESU performance maintenance schedule can be programmed into the analyser for ease of use and uniform testing.

HF leakage current tests ensure that the ESU is limiting the amount of stray capacitive leakage. It must be tested in all available modes and under fault conditions. Tests are carried out from the active and dispersive electrodes in monopolar mode, and from both electrodes in bipolar mode. They ensure that if a failure in any electrode were to occur, leakage should be shielded effectively from the patient. The IEC 60601 standard states that leakage should not exceed 150mA to earth ground through a 200  $\Omega$  load.

Return electrode monitoring tests ensure that the alarms sound and ESU deactivates when the impedance of the patient plate exceeds specified values. The resistance limits are stated in the performance schedule by the manufacturer. Typically, there are low resistance ( $\leq 10 \Omega$ ) and high resistance ( $\geq 250 \Omega$ ) alarm limits.

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