Efficiency of Stun gun Operation

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The article analyses ways of increasing efficiency of stun guns and offers a solution providing efficiency up to 90%. A dominant shock effect results from the voltage impulse amplitude at equal 1 kilohm load capacity, active current value, time of action (average amount of electricity passing through a certain part of a body between two electrodes), distance between the electrodes and the conductor pass. Furthermore, an open-circuit voltage of the device is to beak down garments.

Efficiency of electroshock devices with different electric circuits and various components can be compared in following main characteristics: the voltage impulse amplitudes at 1 kilohm load capacity, and active current values.

In most known electric scheme diagrams for electroshock devices the high-frequency Dc/Ac converter charges the storage capacity that discharges through the high-voltage transformer primary winding on the uncontrolled discharger operation. The secondary transformer winding is connected to the main electrodes of the device.

Based on a price/quality criterion, the best converter electrical scheme diagram is a scheme of a single-ended high-voltage converter (reverse converter).

The efficiency of commercial converters we have developed and produced is 85-95%.

A high voltage transformer design should meet two alternative requirements: wide range of voltage impulse amplitudes both at a high-resistance load (an open-circuit voltage of the device is to beak down garments) and at a low-resistance load simulating the electroshock action on a human body. Finding optimal design of the transformer allows us to start production of transformers with an open-circuit voltage of 60 kilowatt (turn ration – 25), a low load efficiency is 95%. Thus, the cumulative efficiency of the devices developed is 80-90%, which is rather good for the known electroshock designs.