

Pulsed Source of High Voltage

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The department of electric and electrotechnologies conducting research on the use of strong electric field, which is one of the most promising means of influencing the grain mass. One of the priorities of the use of strong electric fields are grains processing for the purpose of disposal of insect pests of grain.

In installations electro-technological processes where high tension is applied, one of the active factors is the strong electric field, that field of tensions over 100 kV / m.

The purpose of research - reduce the size and material source of high voltage, expanding the boundaries of operational parameters adjustment process and improve the efficiency of processing grain.

Results. Structurally pulsed high voltage source includes a power rectifiers, frequency generator with power supply voltage of 12 V, high-block and block and regulations

measurement unit. For the electrical connection between the circuit board used a connection. As a voltage regulator for power supply used laboratory autotransformer LATR-2M

Consider the elements of power source individually.

Block rectifier has a constant power supply voltage 24V rectifier and voltage of 220 V.

Power supply 12 V DC voltage and oscillator frequency structurally executed in one block

Power source DC voltage of 12 V is designed to power the generator frequency constant voltage of 12 V. The scheme consists of alternating voltage step-down transformer that transforms the voltage to level 12, a bridge rectifier. To reduce ripple and stabilize voltage capacitors are designed and stabilizer.

How oscillator frequency synchronization submodule used USR-1C making changes to the electrical circuit. The generator frequency is based on the type of chip K174HA11, it generates oscillations needed to manage high-voltage unit.

Block regulations designed to establish the necessary level of frequency and pulse duration control the output frequency of the generator.

Range frequency output pulses of 1-19 kHz.

Duty cycle pulses varies from 18 to 42% at 1 kHz frequency pulses and 46 to 48% at a frequency of 19 kHz pulse

Vysokokovoltnyy unit is based on the module line scan MS-1C. It is designed for high-voltage power supply voltage pulsed current camera processing grain material

The module consists of input and output stages of the gain control signal, matching transformers, high-voltage pulse transformer type TVS-110PTS15 and voltage multiplier UN9 / 27-1,3.

The voltage in the secondary winding voltage multiplier rises to E1. Voltage multiplier turns into a constant voltage pulse, which is used to power the camera processing grain products.

The measuring unit is designed to connect instrumentation to debug the circuit. The measuring unit allows measurements rectified voltage, frequency and duration of pulses at the output of the generator frequency, and the signal at the pulse transformer secondary winding, which allows adjustment device.

In developed pulsed high voltage source provides frequency and duration of pulses of voltage on the electrodes that provide a great variety of operational parameters of the device.