

LASER ENERGY STORAGE DISCHARGE CIRCUIT



Where is energy stored in a laser network? Energy is stored in the capacitor of the network. When the laser is fired, an RLC circuit is formed in which the resistance is the resistance of the gas discharge. The inductor is chosen for the best energy transfer from the capacitor to the flashlamp or laser tube.



What type of discharge circuit is used for laser flashlamps? Energy stored in the capacitor. Two types of capacitor discharge circuits are used for laser flashlamps. They are the RLC discharge circuit and pulse-forming network (PFN). The choice of circuit to be used for a particular application depends upon required pulse length, pulse shape, energy to be discharged, and desired charging voltage.



What is energy storage & pulse-shaping section? The energy-storage and pulse-shaping section is composed of inductors and capacitors. Capacitors store the energy, the lamp provides the load resistance for the RLC discharge circuit, and the inductors shape the output current pulse.



How does a RLC discharge circuit work? Capacitors store the energy, the lamp provides the load resistance for the RLC discharge circuit, and the inductors shape the output current pulse. RLC discharge circuits are used for short pulse durations and are designed to be critically damped or slightly overdamped.



How does a semiconductor laser work? Of the laser types normally operated by electrical pulses, only the semiconductor laser has a relatively constant electrical resistance. This type of laser is powered by an electrical pulse generator that provides short-duration, low-energy pulses. The specifications for such a power supply are included in Module 3-11, "Semiconductor Lasers."

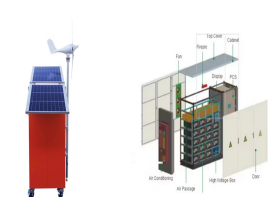
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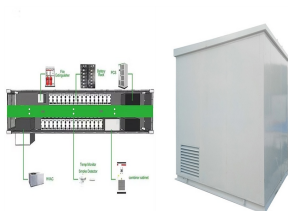
What is a CW laser triggering circuit? Module 3-1, "Power Sources for CW Lasers," describes continuous power sources for CW lasers. The same basic considerations and concepts are used for charging supplies of pulsed lasers. ? The triggering circuit delivers a trigger pulse to ionize the gas and begin the discharge.



Abstract : in the cover image the homebuilt TEA nitrogen laser in use at PhyscsOpenLab. The entire laser is "open air" and is built into an aluminum / iron chassis with brass electrodes. The triggering spark gap is visible in the ???



Generators with inductive energy storage (GIES) are developed for laser application. Discharge and laser parameters in high-pressure gas mixtures are studied. It was shown that the IES ???



Laser and discharge parameters in mixtures of rare gases with halogens driven by a pre-pulse-sustainer circuit technique are studied. Inductive energy storage with semiconductor ???



It is shown that pumping by inductive energy storage unit reduced the influence of the discharge circuit inductance and broadened the range of the operating pressures at which lasing was ???

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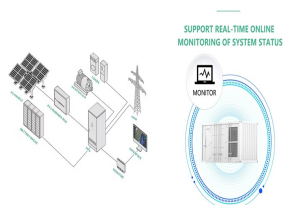


FIG. 1 is an energy storage/discharge circuit used in the prior art. which are 2-5 times as high as the optimal pressures for the switched discharge method. Further, laser energy output ???



Detailed measurements on the discharge and output characteristics of the XeCl laser show that efficient energy transfer from the storage capacitor to the discharge capacitor ???



Producing high output energy with the capacitor-transfer circuit requires a large storage capacitance and a discharge tube with optimum dimensions (an inner diameter of 4 ???



The possibility of using transient processes in the discharge circuit of an electric-discharge laser to pump the active media is analyzed. It is shown that, due to the nonlinearity of the transient ???



It should be mentioned that this excitation technique allows one to change the total laser pulse duration in the range of 4 to 14 s due to the variation of N content in the gas mixture. Fig. 6 ???

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Abstract The electrophysical process in the discharge circuit of a copper vapor laser (CVL) with an LT-10Cu industrial gas discharge tube is studied. It is shown that the pumping of the active ???