

Title (en)  
ELECTRICAL EXCITATION CIRCUIT FOR GAS LASERS.

Title (de)  
ELEKTRISCHE ANREGUNGSSCHALTUNG FÜR GASLASER.

Title (fr)  
CIRCUIT D'EXCITATION ELECTRIQUE POUR LASERS A GAZ.

Publication  
**EP 0243374 A4 19880215 (EN)**

Application  
**EP 86902263 A 19851018**

Priority  
US 8502019 W 19851018

Abstract (en)  
[origin: WO8702517A1] An electrical excitation circuit (10) for a gas laser. The electrical excitation circuit includes a charging circuit (16), connected in series with a pulse forming network (18) between a power source (12) and the laser load (14). The charging circuit (10) includes a capacitor charged by the power source (12) and a thyatron (S1) for transferring voltage to the pulse forming network (18). Alternatively, the charging circuit (10) includes a capacitor charged upon the firing of a silicon controlled rectifier (SCR1) through a saturable step-up transformer (XFMR1) which saturates for transferring voltage to the pulse forming network (18). The pulse forming network (18) includes a saturable inductor switch (S2) positioned with respect to a capacitor so that, when the voltage on the capacitor reaches a predetermined level, saturation on the saturable inductor switch (S2) releases electrical energy stored in the capacitor to the laser load (14). The saturable inductor switch (S2) is biased by means of an electrical bias current which can be adjusted so that the saturable inductor switch (S2) saturates after the capacitor is fully charged, thereby controlling the time of application of the high voltage pulse to the laser load (14). The pulse forming network (18) preferably includes an additional capacitor and a magnetic diode charging inductor (L3) which is also biased by means of an electrical bias current. The capacitor is charged through the magnetic diode charging inductor (L3) and discharges in series with the other capacitor when the saturable inductor switch (S2) saturates, thereby doubling the voltage across the laser load (14) at the time of discharge. The magnetic diode charging inductor (L3) also minimizes prepulse across the laser load (14) during charging of the additional capacitor. Neither the saturable inductor switch (S2) nor the magnetic diode charging inductor (L3) are in the discharge loop (LD) with the laser load (14) thereby minimizing the inductance of the discharge loop (LD).

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CPC (source: EP)  
**H01S 3/097** (2013.01); **H03K 3/55** (2013.01)

Citation (search report)  
• [AD] US 4275317 A 19810623 - FROSCHE ROBERT A ADMINISTRATOR, et al  
• [A] US 3002113 A 19610926 - WINN OLIVER H  
• [A] US 3211915 A 19651012 - POEHLMAN BARRY W, et al  
• See references of WO 8702517A1

Designated contracting state (EPC)  
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