Lazer Power Supply based on Multiphase Resonance Converters

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Abstract – The laser power supply construction structure has been proposed on the base of multiphase resonance converter.

Keywords – laser power supply, multiphase resonance converter.

1. INTRODUCTION

When choosing the construction of the block diagram of the laser power supply, it is necessary to take into account all possible operating modes, namely, a start mode, which is provided at, 200 – 230 V and requires voltage limiting at a level 250 V, and a light mode at 60 - 70 V at a stable current of 22 – 25 A. The requirements to the output parameters are plotted in Fig. 1.

When the laser is lighted there may be break-down. Therefore, a reliable protection of the power supply from the short-circuit in the load is required.

II. PROBLEM FORMULATION

It is possible to construct high-power supplies using the boost principle [1]. However, the laser power-supply systems create the problem of smooth transition from the start mode to the light mode since the recommutation process is of stepped nature and makes difficult the parametric testing. The mentioned disadvantages may be avoided by using the multiphase resonance converter as a buck converter [2], which allows to regulate the output voltage within broad limits of 60 – 250 V and make a smooth transition from voltage regulation to current regulation, thus the recommutation devices may be excluded.

The block diagram of the laser power supply using the multiphase resonance converter as a boost is shown in Fig.2.

III. CONCLUSION

1. The main requirements to the laser power supply and possible ways for constructing it on the base of boost circuits have been considered.

2. The structure of the construction of the laser power supply on the base of the multiphase resonance converter has been proposed.

3. There have been analysed and shown the main advantages of the construction of the laser power supply based on the multiphase resonance converter and its possible use in similar devices.

REFERENCES
