

Selection of optimal operating parameters of pulsed xenon lamps for biomedical and environmental applications

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An approach is proposed to determine the optimal operating parameters of tubular pulsed xenon lamps, providing spectral, energy and resource characteristics of lamps acceptable for current biomedical and environmental applications. The approach is based on fundamental ideas about the physics of high-current pulsed discharges in gases and the results of experimental and well-tested theoretical studies of pulsed xenon lamps. It is shown that the optimal operating parameters are determined by the design parameters of the lamp and the surface density of the electric power of the discharge, the recommended values of which for the above applications are 60 ± 15 kW/cm². The results of experimental studies of the main electrical, spectral, energy and resource characteristics of a standard pulsed xenon lamp in the mode corresponding to the developed recommendations are presented.

Keywords: pulsed xenon lamp, optimal operating parameters, spectral characteristics, brightness temperature, service life.

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