

DUTY CYCLE EFFECT ON UNIPOLAR MICROSECOND PULSED DISCHARGE IGNITION IN NITROGEN

This paper reports the results of studying the duty cycle effect on unipolar pulsed discharge ignition in low pressure nitrogen. In order to break down the gas with short voltage pulses (small duty cycle values) one ought to apply higher voltage values than those for long pulses with large duty cycle values. On increasing the duty cycle the breakdown voltage approaches the value corresponding to the ignition value of the dc glow discharge at the gas pressure given. On increasing the gas pressure the degree of duty cycle affecting the gas breakdown in the pulsed unipolar microsecond electric field weakens. At low pressure values (to the left of the breakdown curve minimum) and short voltage pulses a low-current mode appears (with the current growing during the pulse), and at higher voltage values one observes an abnormal pulsed discharge with a high current.

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