

## **I-V-Characteristics and the Transition from Glow to Arc**

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The relation of current and voltage is historically used to classify the type the discharge. This approach served well over the decades for well-define cases, like large area electrodes with a specific type of gas at a given pressure and steady-state conditions. Difficulties arise due to a large number of additional conditions that may play a role in the discharge such as temperature, shape and surface conditions of the electrodes, the presence of a magnetic field, changes in the supplied power (non-stationary conditions), and/or supplement of charged particles from additional sources. The transition region between glow and arc is especially “treacherous” because the old rule that “glow” is a low current and “arc” is a high current discharge does not always hold in the transition region when using modern power supplies and magnetic fields. These considerations are not just of academic interest since arc suppression in magnetron systems need to consider BOTH current and voltage to implement the appropriate sensor – response circuitry.