

- The voltage of the battery is kept below the ionization potential of the gas.
- If radiation penetrates through the window and enters the envelope it would ionize some of the gas atoms. The resulting $-ve$ ions go towards the anode and $+ve$ ions go towards the cathode. In their passage, the ions collide with some of the gas atoms, causing them to be ionized in turn. This process continues till the whole of the gas atoms are ionized. A pulse of current then flows through the tube, the current flows through the resistance R which is connected in the anode circuit. The resulting voltage drop across R is the output voltage.
- Once ionization is established it is supposed to continue indefinitely; however, since resistor R which has a high resistance, is connected in series with the anode and the battery, when the gas ionizes, a heavy current flows through the resistance causing a large voltage drop. The voltage drop is sufficient to reduce the anode voltage below the ionization potential and therefore ionization ceases.