Electrical characteristics of Neon Lamps

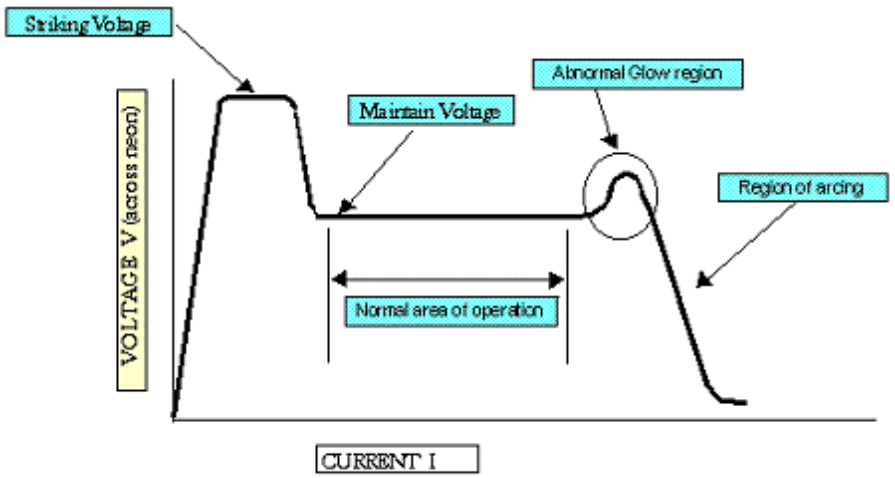

Fig 1 VOLTAGE V'S CURRENT CHARACTERISTIC

Neon lamps have a current/voltage characteristic as shown in Fig 1 above.

As explained in section 4 (operation), little current flows until the striking voltage has been reached. As ionisation of the gas occurs, the voltage appearing across the neon drops to the "maintaining voltage" and current flows requiring an external series resistor to limit the current to the designed value. This is the normal area of operation for the lamp. Any increase in voltage across the lamp passed this safe area will cause an increase in the maintain voltage accompanied by an abnormal glow in the tube followed by formation of arcing.

To give some idea of the voltages and currents involved look at the example given below for TIMELAMP'S T16/30HB. For a T16/30HB design current I is 1.5mA. Maintain voltage V for this type is a nominal 60 Volts.

I

R

V

To calculate the series resistor R required to operate this neon from a 240V ac supply, simply subtract the maintain voltage from the supply voltage (in this case 240V) to obtain the voltage across the resistor.

Then, using Ohm's calculate the Resistance required.

240V-60V = 180V across R.

Therefore R=180/1.5mA which gives a value of 120Kohms.

Using I2R can now be used to calculate the correct wattage resistor. In the above case For a current of 1.5mA and resistor value calculated at 120Kohms gives a power dissipation of 0.27W. So it can be seen in this example that a 120Kohm 0.33W carbon film resistor is quite adequate for supplying this neon from 240v ac mains supply.

What is a Neon Lamp - Features - Applications - Operation - Electrical Characteristics - Life

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