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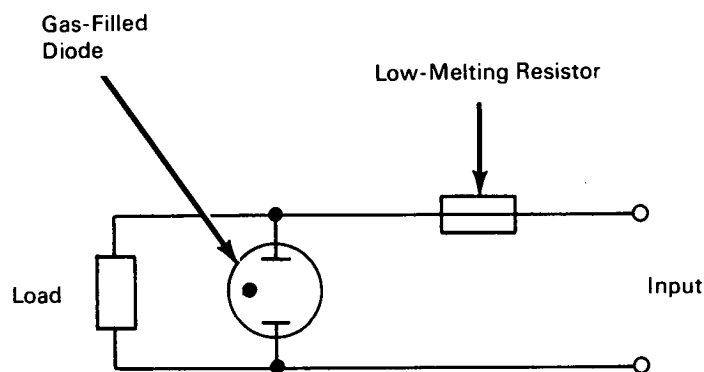
Brief 69-10490

# NASA TECH BRIEF



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## Fuse Protects Circuit from Voltage and Current Overloads



A simple fuse has been designed to protect a circuit load from voltages and currents exceeding specified limits. Such a fuse protects test subjects and patients being monitored by electronic instrumentation from inadvertent application of voltage and current overloads. It also protects sensitive electronic equipment and components against high-voltage damage.

A low-melting resistor connected in series with the load protects the circuit against current overloads. At lower currents, power is delivered to the load as long as the voltage across it does not exceed some predetermined value above the breakdown voltage of a gas-filled tube connected in series with the load. When this value is exceeded, current flow through the grounded cathode effectively places the tube in parallel with the load, as shown in the equivalent circuit above. The increased current causes the low-melting resistive element to melt, thereby breaking the circuit.

By proper choice of the low-melting resistor and gas-filled tube, circuits can be protected against any

specified voltage and current overloading. For low-voltage protection, the gas-filled tube should contain a small amount of radioactive material to lower the ionization voltage to the required value.

### Note:

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### Patent status:

This invention has been patented by NASA (U.S. Patent No. 3448341), and royalty-free license rights will be granted for its commercial development. Inquiries about obtaining a license should be addressed to NASA, Code GP, Washington, D.C. 20546.

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Category 01