

COMMITTEE G: Education & Training
Communication & Signal Division AAR

A-6 Fuse

Approved January 1974

Definition: An electrical conductor inserted in a circuit to open the circuit by melting when the current exceeds the value which the fuse is capable of carrying.

Symbol:



Description: A fuse is made of a special conductor which has a low melting point and is usually enclosed in a non-conductive material and provided with a means of connecting it into the circuit to be protected. The enclosure provides protection for the fuse element and tends to prevent fire when the fuse melts.

Three common types of fuses are: Non-renewable cartridge Figure 1; non-renewable plug Figure 2; and renewable cartridge Figure 3.

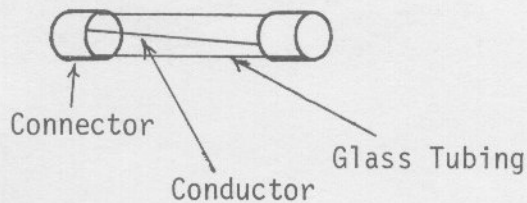


Figure 1

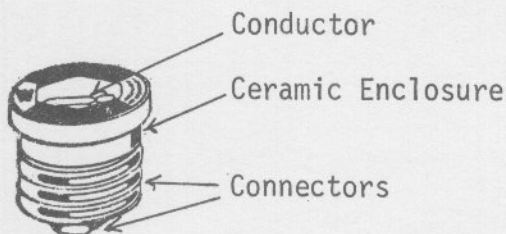


Figure 2

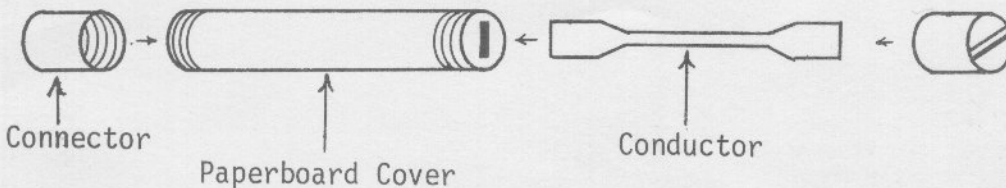


Figure 3

Purpose and Application: The purpose of a fuse is to protect electrical apparatus from excessive current. For example, if a motor is prevented from rotating because of a mechanical obstruction or if a short circuit occurs within the windings, excessive current will be drawn through the fuse, melting it, thus opening the circuit and preventing possible serious damage.

In signal systems, fuses are used to protect motors, battery chargers, power connections, electronic and other electrical equipment.

General Information: Fuses are made in various sizes and ratings, which are clearly marked on the fuse. Many special circuits require a slow-acting type fuse, commonly referred to as "slow-blow," which will allow current exceeding its rating to flow momentarily without opening the circuit. If the excessive current is applied for too long a period, the fuse will melt and the circuit will be opened. A standard fuse does not have this momentary excess current capability.

When a fuse melts, the cause of excess current should be determined before the fuse is replaced. When replacement is made, care must be taken to ensure that the correct type (regular or slow-blow) with proper rating is used. A fuse with too low a rating may cause unnecessary outages, while one with too high a rating may cause damage to equipment.

Detailed Operation: When an overload occurs, excessive current generates enough heat to melt the fuse conductor, which opens the circuit and prevents further current flow and possible damage to equipment. The fuse conductor is selected so that it will melt if the current rating of the circuit it is protecting is exceeded.