

## **5. CHECKING POWER SUPPLIES, SOCKETS, PLUGS AND SPARES**

If a machine fed from a socket outlet does not work, carry out the following simple procedures:

### **1. If the machine fails to operate when plugged into the socket outlet and switched on:**

- check whether the machine has a mains indicator lamp:

**if yes**

- is it glowing?

**if yes**

- the problem is in the machine

**if no**

- the problem is either at the socket outlet, or in the mains lead, or the indicator lamp has blown and maybe the machine has an internal fault.

### **2. Checking the socket outlet:**

- unplug the machine
- plug in an appliance that is known to be working and switch on
- if this appliance works, the problem is in the mains lead or the plug
- if the appliance does not work the mains socket outlet is not working

### **3. Checking the main circuit fuse or circuit breaker. If its location is not known, call in an electrician:**

The main circuit fuse or circuit breaker should only be replaced or re-set ONCE.

If it should blow for the second time the circuit itself is faulty and an electrician is needed.

Only replace the fuse with the same type and size. Fitting a larger sized fuse could lead to a fire. Fitting a smaller sized fuse will cause the fuse to blow either immediately or shortly after the machine has been re-started. If in doubt call an electrician.

The circuit breaker will not re-set if there is a standing fault in the circuit.

### **4. Checking the mains lead:**

See Figure 5.

### **5. Machine fault:**

The correction of machine faults should be carried out by trained staff only to the levels recommended for individual machines. Otherwise they should be returned to the workshop for expert repair or a repair person should be brought in.

## 6. Overloading the main circuit:

In order to prevent overloading the main circuit a simple calculation can be carried out if two of the following three facts are known:

- the amount of power the machine uses
- the amount of current which flows when the machine is switched on
- the machine's voltage

Usually this information is on the data plate fixed to the machine.

Power will be given as wattage or watts (W)

Current will be given in amperes or amps (A) (normally Alternating Current or AC)

Voltage will be described as voltage or volts (V)

### Make calculations as follows:

Number of watts divided by the number of amps = number of volts

or

Number of watts divided by number of volts = number of amps

or

Number of amps multiplied by number of volts = number of watts.

Direct Current (or DC) calculations are the same.

IT IS VERY IMPORTANT TO USE MACHINES ON THEIR DESIGNATED SUPPLY e.g. 240 VAC or 12 VDC.

If there is any doubt obtain expert advice before attempting to use the machine.

#### *Example 1:*

A machine is required to work from a 13amp socket outlet that works on 240 volts AC and the power requirement is 2000 watts:

2000 divided by 240 = 8.33 amps. It may be used.

#### *Example 2:*

A machine is required to work from a 15amp socket outlet that works on 240 volts AC and the power requirement is 4000 watts:

4000 divided by 240 = 16.6 amps. It may not be used.

## 7. Wiring plugs:

Electrical equipment in hospitals may have come from different countries and therefore may not match the local electrical situation.

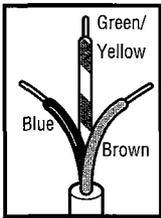
However, good practice is the same throughout the world and the method described in Figure 6 is a copy of the British Safety Council's recommendation for the British standard 13amp plug.

IN ADDITION ALWAYS MAKE SURE THAT THE EARTH WIRE IS LONGER THAN THE OTHER TWO SO THAT IF THE CABLE IS ACCIDENTALLY PULLED OUT OF THE PLUG, THE EARTH WIRE IS THE LAST WIRE TO BECOME DISCONNECTED.

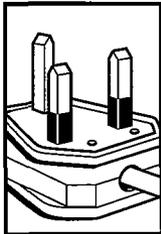
It is very important when fitting a plug to a new piece of equipment to make sure that it is connected correctly. If it is not, the result can be an electric shock or fire.

IF THERE IS ANY DOUBT WHATSOEVER, CONSULT A COMPETENT ELECTRICIAN.

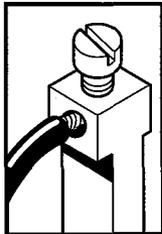
## PLUGS



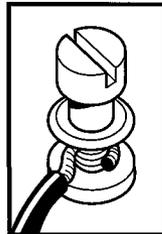
■ The wiring of a plug is colour coded for a very good reason, to help guard against electrical accidents. Remember to ensure that the brown wire goes to the live terminal; blue to neutral; and green/yellow to earth.



■ USE plugs with sleeved pins for extra protection.



■ NEVER tighten pillar terminal screws on to the insulation.



■ ALWAYS wind wire clockwise onto stud terminals to keep them secure.

## Always use the correct fuse

■ DIFFERENT appliances, whether in the workplace or in the home, require different fuses. When purchasing new electrical equipment, be it a computer terminal, a vacuum cleaner or even a basic desk lamp, always check with the manufacturer's instructions that you have installed the right fuse *before* operation. For equipment up to 720 watts, use a 3amp fuse; for over 720 watts, use a 13amp fuse. In addition, if you want to be sure that your equipment is safe, always buy fuses that are approved to BS1362.



## HOW TO WIRE A PLUG

- 1** START off by unscrewing the plug cover and removing the fuse.
- 2** NEXT, remove one of the cross-bar cord grip screws, and loosen the other.
- 3** USE wire strippers to cut away about 5 centimetres (2 inches) of the outer sheath of the supply cord, without cutting into the insulation around the conductor wires. Alternatively, using a sharp blade, cut down the sheath following the line of the green/yellow conductor. Pull the conductor wire through the slit and cut away the outer sheath.
- 4** REMOVE any iron solder on the ends of the wire strands.
- 5** LAY the flex onto the plug, ensuring that the outer sheath can be held by the cord grip. Position the conductors to their correct terminals: brown to live (L); blue to neutral (N); and green/yellow to earth (E). Cut the conductors to the right length, and strip off sufficient insulation to expose the wire strands. For pillar terminals, leave 6mm (0.25 inch), or 13mm (0.5 inch) for studs. Twist the strands of each wire together.
- 6** GUIDE the exposed wire into the terminals, right to the edge of the insulation. Then turn the screw down tightly onto the wire - not the insulation.

- 7** ENSURING that the coloured wires lie flat without sharp bends, fasten the cord grip firmly to the outer sheath of the flex. Screw it down gently, moving from one screw to the other.
- 8** GIVE the supply cord a sharp tug to make sure it is secure.
- 9** CHECK again that the conductors are connected to the right terminals and that there are no loose strands protruding.
- 10** PUT the correct fuse into place, and screw the two halves of the plug back together.

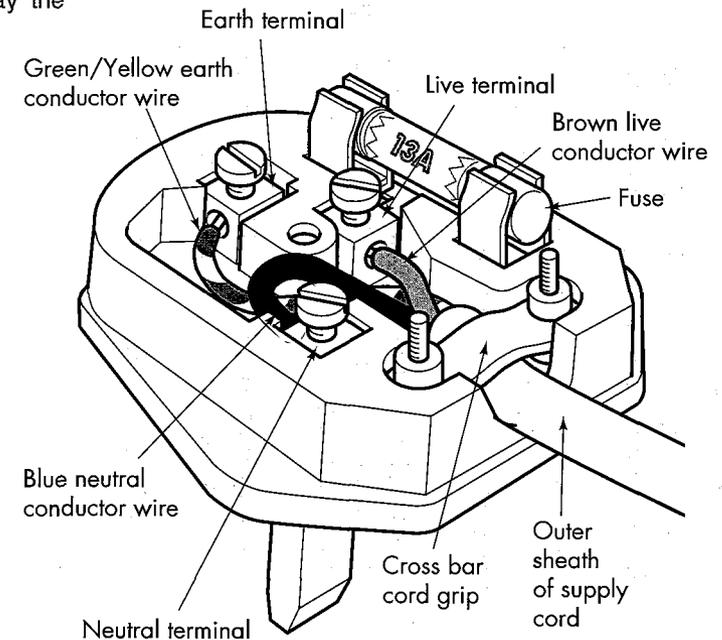


Figure 6: How to wire a plug

Source: British Safety Council