

BUILDING A TEST RESISTOR KIT

An information resource provided free of charge by
the NECA Foundation

Who should test a circuit prior to connection to the supply?

- Circuit testing must be performed by a qualified licensed electrician, or a person in training under the direct supervision of a licensed electrician.
- This information resource is provided by the NECA Foundation only for use by qualified persons. NECA Foundation does not accept any responsibility for the use of this resource. Persons using this resource and any test kits resulting from its use do so at their own risk.

WHY BUILD A TEST RESISTOR KIT?

- AS/NZS 3000 and AS/NZS 3017 require that all electrical installation work is tested before it is connected to the supply.
- To test a circuit for correct polarity, continuity of earthing conductor, intermix with other circuits, and (in the case of circuits wired in conductors up to approx 6.0mm²) fault loop impedance, the testing can be performed with an ohmmeter and a test resistor kit. This avoids the need to use trailing leads and minimizes time taken to perform the testing.
- AS/NZS 3017 provides clear guidance on the required testing methods

WHAT IS NEEDED TO BUILD A TEST RESISTOR KIT?

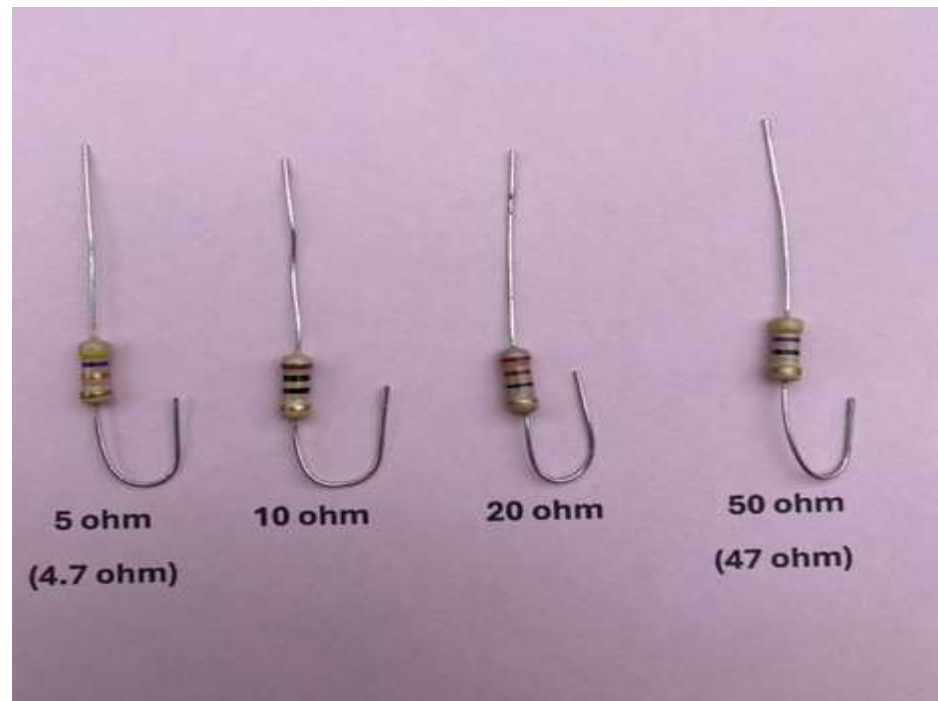
To build the test resistor kit shown in this resource you need –

- Four resistors, with values close to 5 ohm, 10 ohms, 20 ohms and 50 ohms
- A short section of 20mm diameter PVC conduit approx. 100mm long
- Five small alligator clips
- Flexible cable, such as may be acquired by stripping a section of three core flex approx. 600mm long to provide three colours – brown, blue and green.

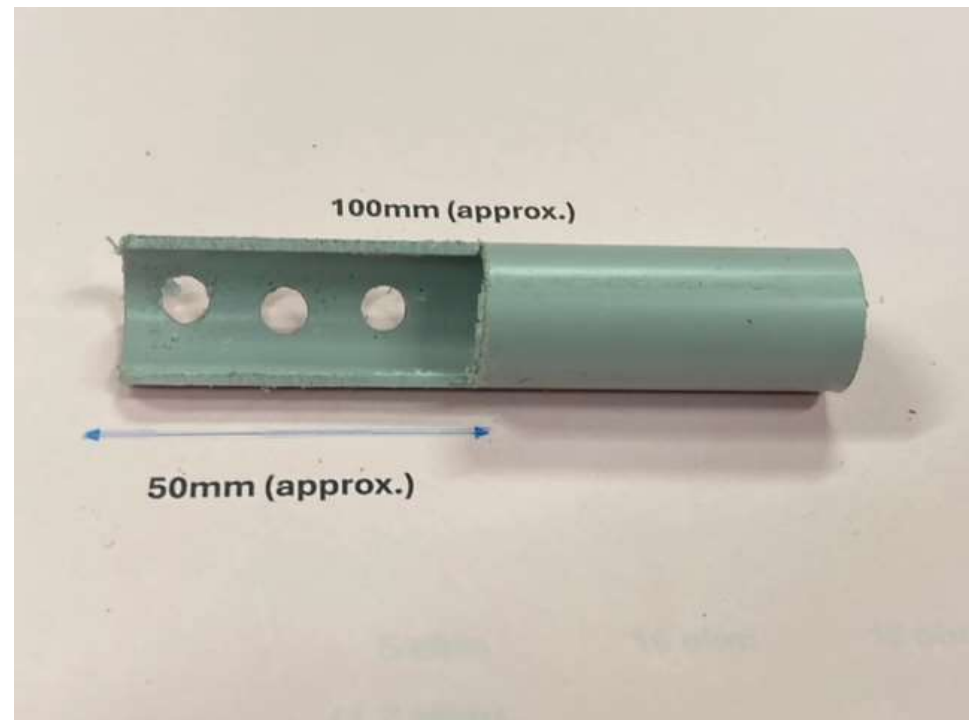
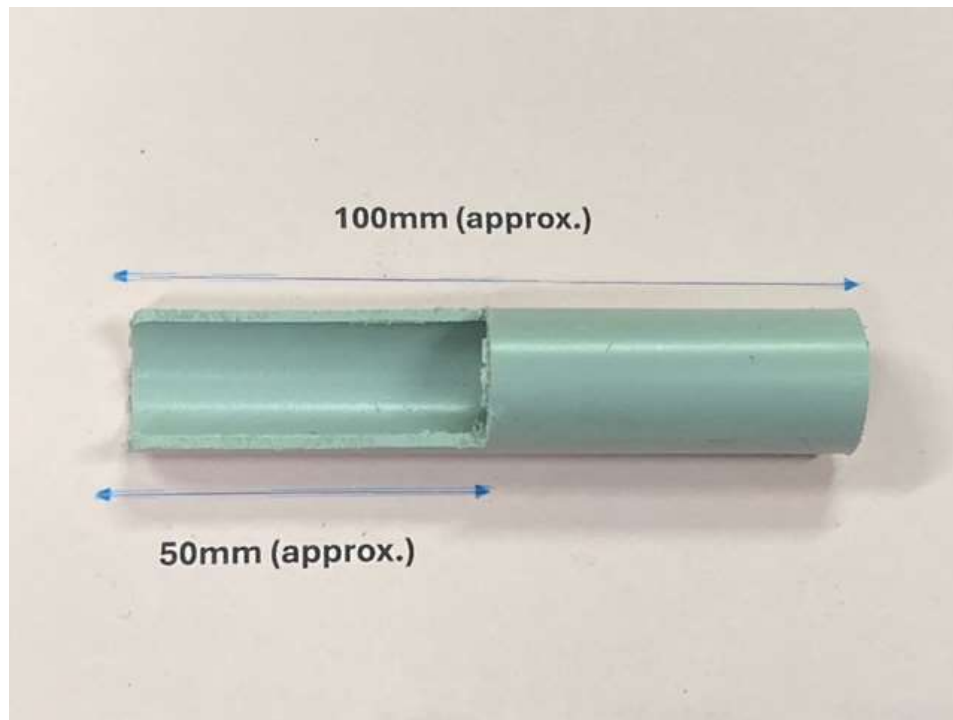
Resistors, such as the 1 watt resistors used in this resource, and the small alligator clips are available from stores such as Jaycar etc for a very modest cost.

The four 1 watt resistors used in this resource fit easily inside the short section of 20mm dia PVC conduit.

Note that 4.7 ohm resistors are a stock item, rather than 5 ohms. The 10 ohm, 20 ohm resistors are stock values and 47 ohm stock values are used for the 50 ohm resistor.

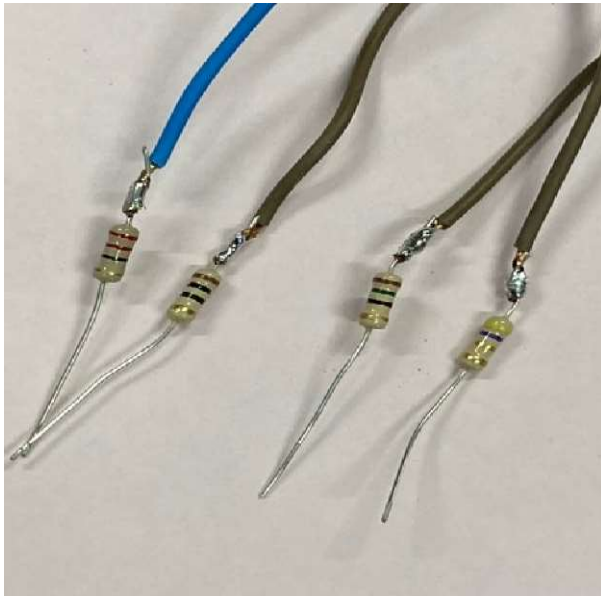


Cut and shape the 100mm long section of PVC conduit, drilling three holes of approx. 8mm in the cut section

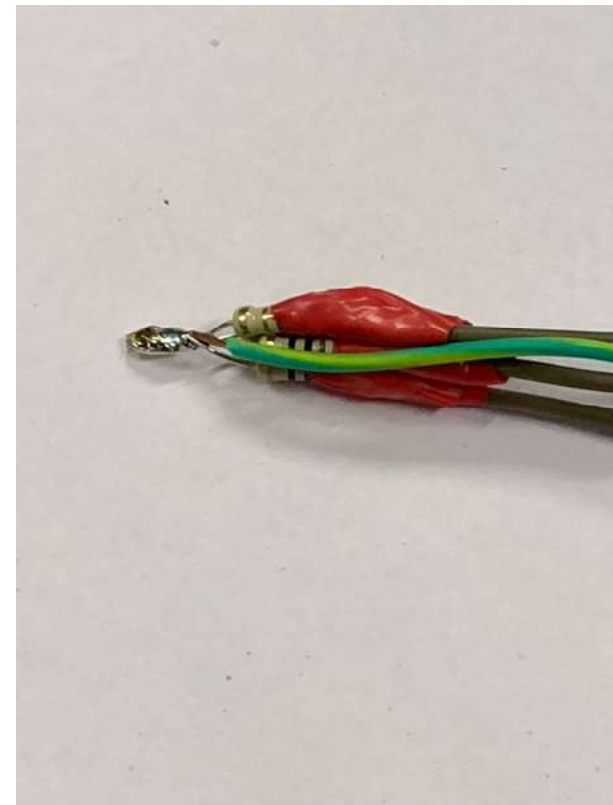
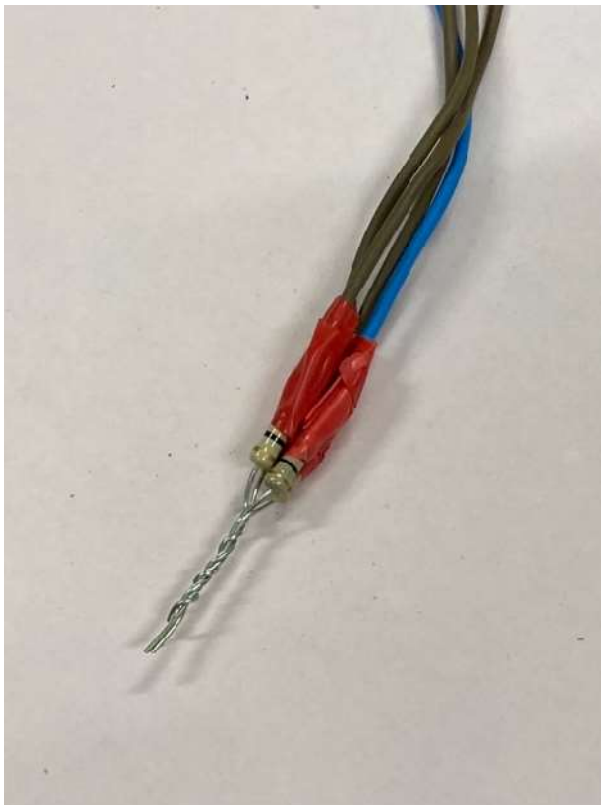


Trim the wire on one side of each resistor to approx. 20mm long. Do not trim the other side.

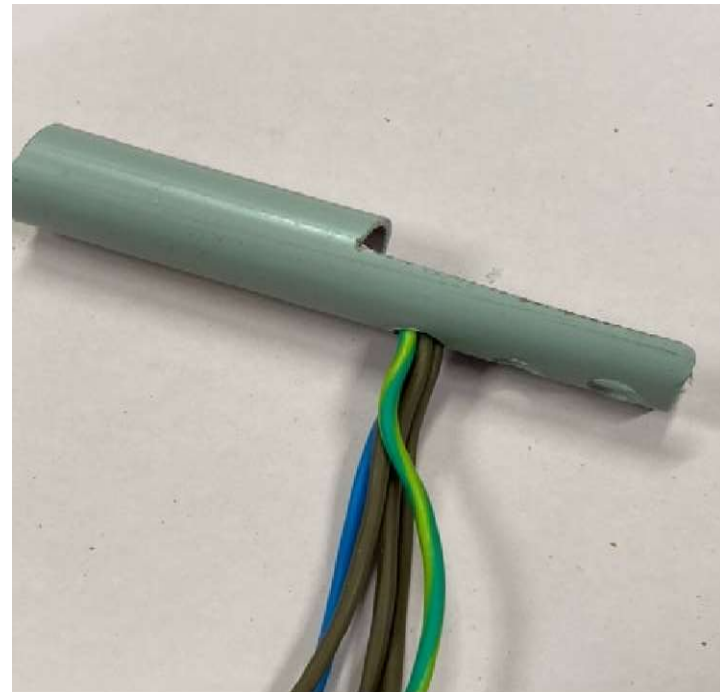
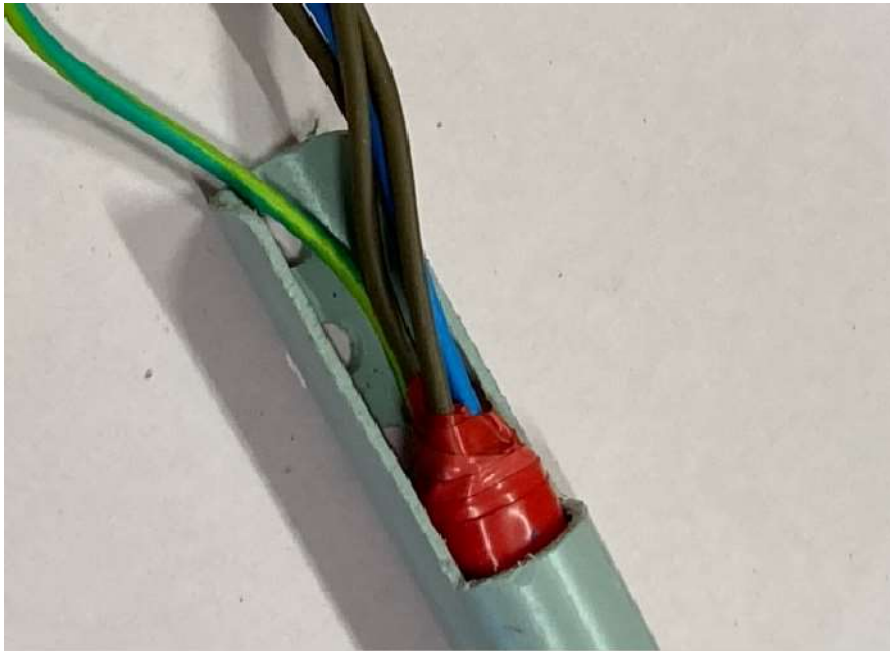
Solder a 200mm length of brown flex cable to each shortened end of the 5 ohm, 10 ohm, and 20 ohm resistors. Solder a 500mm length of blue flex cable to the 50 ohm resistor. Using heat shrink or insulation tape cover the soldered joints.



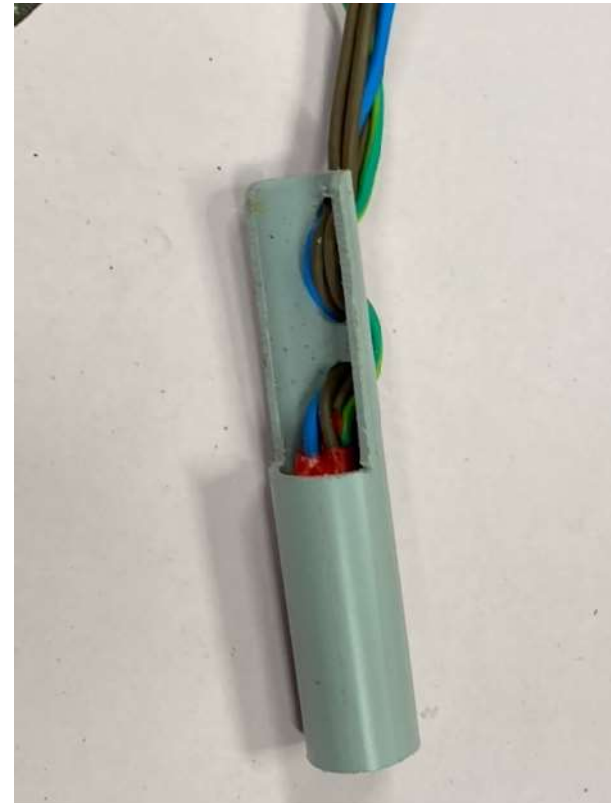
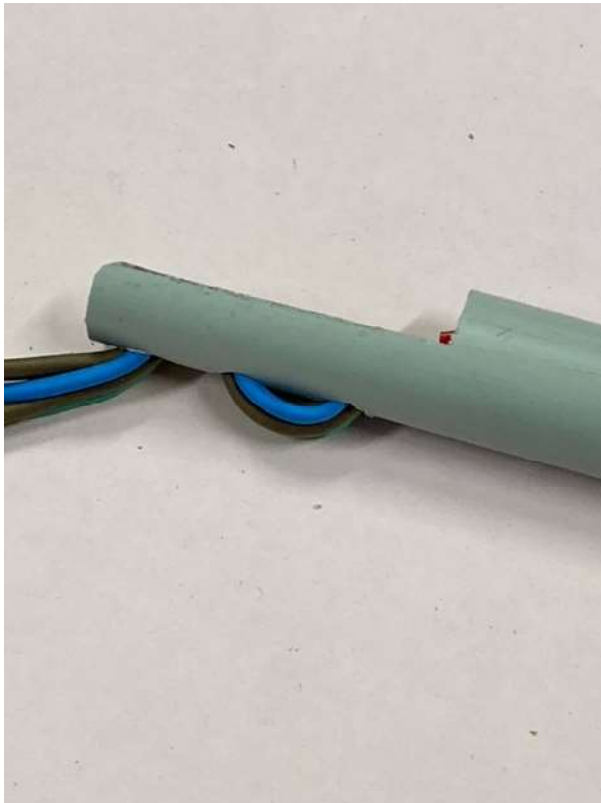
Group the resistors in a square group and twist the untrimmed wire ends together firmly. Solder a 500mm approx. length of green/yellow flexible cable to the twisted wires. Trim the connection to a minimum practical length after soldering.



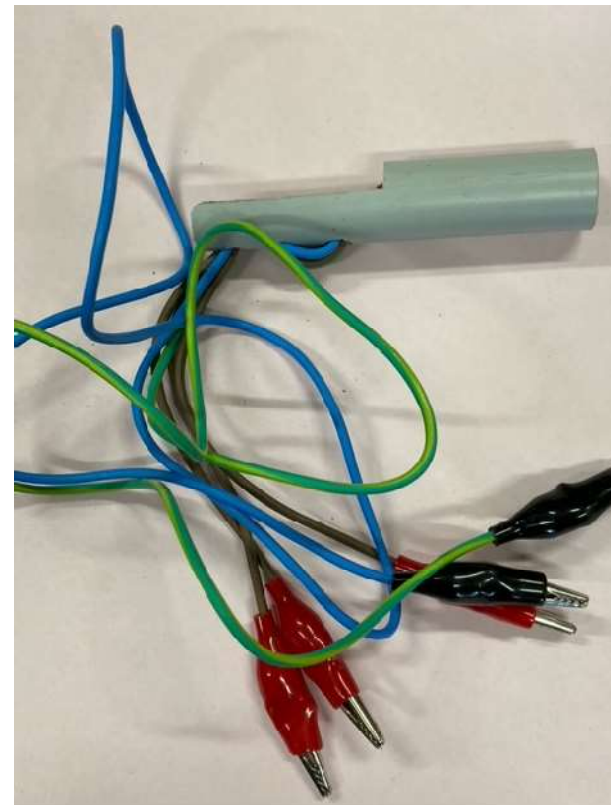
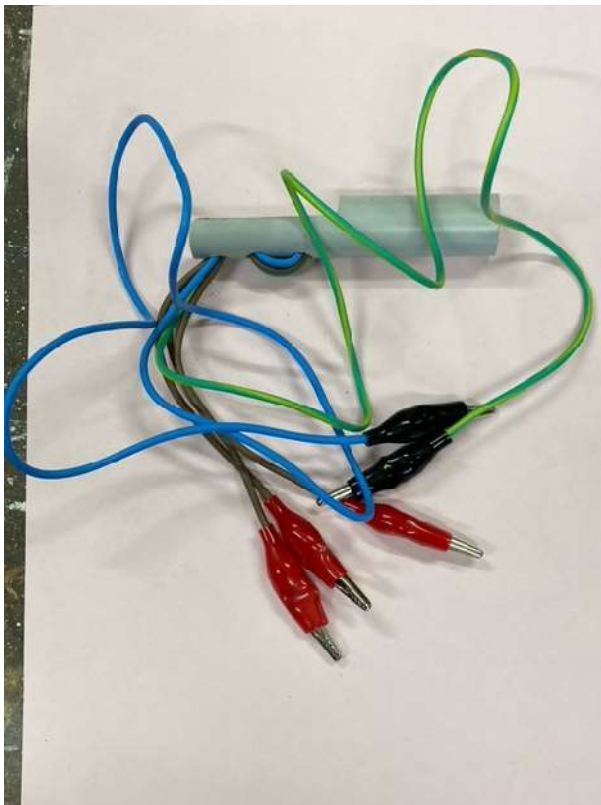
Wrap the grouped resistors in insulation tape so that it is a neat fit into the conduit. Then feed each of the cables through the first of the holes drilled in the conduit



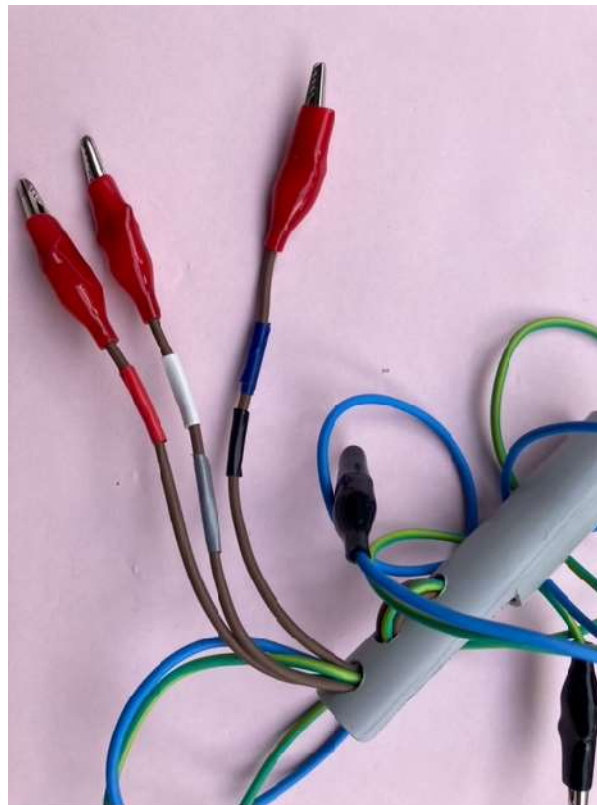
Neatly feed the flexible cables through the next two holes, providing an anchoring effect to prevent strain on the connections to the resistors



Connect the alligator clips to the flexible cables. In this example, red alligator clips are fitted to the 5 ohm, 10 ohm, and 20 ohm resistors, and a black clip to the 50 ohm (neutral) resistor. A black clip has been used for the green/yellow (earth) cable as this was available due to the clips being available in packets of two – red and black



Using insulation tape, colour code the three brown leads to indicate the phase polarity of the leads – 5 ohm red, 10 ohm – white, and 20 ohm – blue. Alternatively use 5 ohm – brown, 10 ohm – grey, and 20 ohm – black. In the example shown, both colour codes have been used.



The test resistor kit is now ready for use.



- For testing single phase circuits, use the 5 ohm resistor to connect in the active line. The low value resistor is preferable when testing for fault loop impedance
- For testing three phase circuits, use the 5 ohm, 10 ohm, and 20 ohm resistors for the three active lines