203: Electrical installations technology  
**Handout 7: Cooker circuits and diversity**

**Learning outcome**

The learner will:

1. know wiring systems of electrical installations.

**Assessment criteria**

The learner can:

3.1 describe principles of operation of different **circuit types.**

**Range**

**Circuit types**: Lighting, power and heating, alarm and emergency systems, data communications, control circuits, ring final, radial.

**Cooker circuits and diversity**

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| Traditional free‑standing cookers are generally one of the largest current-using pieces of equipment in domestic premises. Therefore, they are fed by their own circuit directly from consumer control unit (CCU).  Adjacent to the cooker there will be a double pole switch to control the supply to the cooker. This switch may or may not incorporate a 13A socket outlet. | 01 cooker switch.png |

When determining the size of cable to be used for the cooker circuit, it is necessary to calculate the design current, Ib, of the cooker. Simply, all we need to do is to take the total power rating of the cooker and divide it by the voltage to give the current.

However, it is very unlikely that everything on the cooker will be turned full on simultaneously. Even if all the elements are on, built-in control gear, such as simmerstats and ovenstats, will mean that full current will probably not be drawn.

Therefore, we can make an allowance and reduce the design current when calculating protective device rating and cable size. This allowance is referred to as **diversity**.

Appendix A of the IET On‑Site Guide covers maximum demand and diversity, and Table A2 (page 117) gives the allowances for diversity for various types of circuit and premises. For a cooking appliance in an individual household installation, the following allowance can be made:

* the first 10 amperes
* plus 30% full load (f.l.) of connected cooking appliances in excess of 10A
* plus 5A if a socket outlet is incorporated in the control unit.

**Example 1**

Calculate the assumed demand for a 230 volt cooker which contains:

* 2 x 1.0kW hob plates
* 2 x 2.0kW hob plates
* 1 x 2.0kW oven/grill
* 1 x 3.0kW oven

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The assumed current demand, allowing for diversity, is:

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This means that the cable supplying this cooker would have to have a rating of at least 21.35A. If the control unit contained a socket outlet then the rating would have to be at least 26.35A.

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| 02 cooker circuit.png |