203: Electrical installations technology  
**Handout 5: Lighting circuits**

**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.

**Lighting circuits**

Here are some points to note.

* All lighting points, unless specific light sources with known power ratings are being used, are assumed to have a rating of 100 watts minimum.
* In order to ensure that there is not a complete blackout when a fault occurs, we should install at least two lighting circuits in the premises.
* Earthing terminal and cpc. must be provided at **all** lighting points, including switches and ceiling roses.
* 5/6 amp protective devices are normally used to protect domestic lighting circuits (5 amp if BS3036 semi-enclosed rewireable fuse; 6 amp if a circuit breaker).
* Domestic lighting circuits are generally wired in 1.0mm2 or 1.5mm2 cables.
* Two types of wiring system are used for lighting circuits:
* **two-plate system** – normally used where single-core cables are used, eg in conduit and trunking systems
* **three-plate system** – normally used where multi-core cables are used, eg domestic installations using twin and earth.

**Practical lighting circuits – two-plate**

**One-way switching**

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| 01 2-plate 1-way.PNG |

Here are some points to note.

* Single pole switches and protective devices **must** be installed in the line conductor **only**.
* For Edison Screw (ES) lamp holders the line conductor **must** be connected to the centre contact of the lamp holder.

**Two-way switching**

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| 02 2-plate 2-way.PNG |

**Two-way and intermediate switching**

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| 03 2-plate intermediate.PNG |

**Practical lighting circuits – three-plate**

**One-way lighting circuit**

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| 04 3-plate 1-way.PNG |

**Two-way conversion lighting circuit**

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| 05 3-plate 2-way.PNG |

Here are some points to note.

* Although this is called a *‘*conversion’ circuit, most electricians use this circuit as a matter of course in domestic installations. For example, the landing light in a house would be connected to the upstairs lighting circuit with the switch drop going to the switch on the landing. The three‑core and cpc would be run from the landing switch downstairs to the switch at the bottom of the stairs.

**Intermediate switches in the two-way conversion lighting circuit**

Intermediate switches can be inserted in to the two-way conversion circuit, as shown below:

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| 06 3-plate intermediate.PNG |

**Looping at switches**

Domestic lighting circuits have for many years been connected using the three-plate method where the loop terminal is at the ceiling rose.

Today it is increasingly likely to have a decorative light fitting or even down lighters fitted in place of a standard pendant. These fittings are rarely provided with a loop terminal.

As a result, it has become more popular to make the loop connection at the switch.

This has the advantage of the connections being accessible and at a more convenient working height.

However, this leaves the problem of terminating the neutral conductor. One solution is to connect the neutral to a connector block inside the wall box, which takes up extra space.

Some accessory manufacturers now produce light switches with a built-in neutral loop terminal.

An example of looping at the switch is shown on the following page.

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| 07 Loop at switch - turned.PNG |