



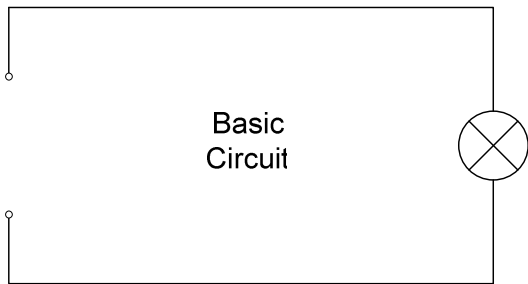
Lighting Circuits

www.electricalquals.com

Lighting Circuits

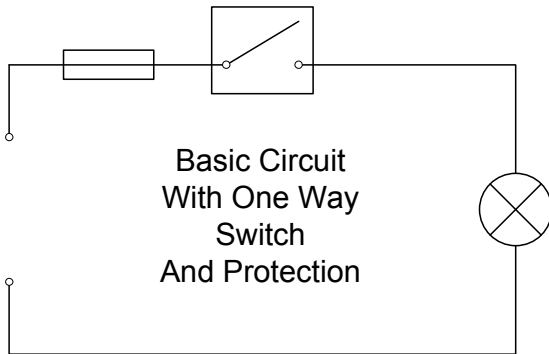
All circuits start off with a very simple concept. In fact, by applying the simplest of one way circuits and merely expanding on the concept, even the most complicated installation circuit can be broken down into easy to understand chunks.

The Basic Circuit (Circuit Diagram)



The basic circuit is the simplest form. It literally contains 2 conductors, enabling us to gain a potential difference, and a load, in the case of a lighting circuit, a lamp.

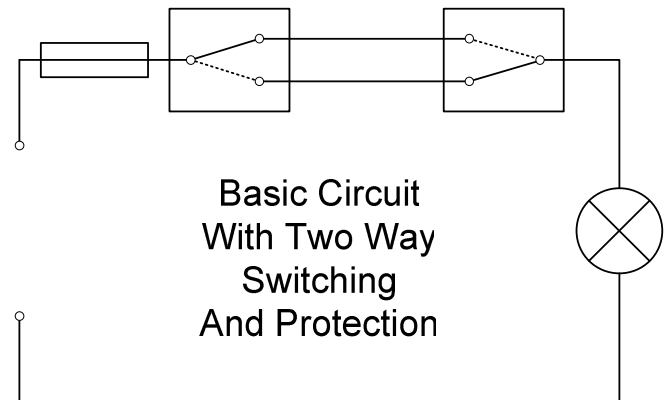
The expanded basic circuit



What the basic circuit doesn't allow is the control of the flow of electrons. By installing a device that will

interrupt the flow, we can control the flow of electrons. Also, by adding circuit protection, a fusing device, we can ensure that we can control the circuit manually, and also control it automatically in the event of a fault.

So, what's the next step?

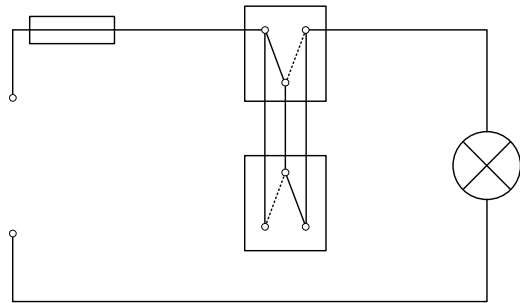


Sometimes it is necessary to control a load from more than one point. Think about a domestic situation, say for example the staircase. In this instance, you would look at controlling the circuit from both the downstairs and the upstairs. For this reason, we create the 2 way switching circuit.

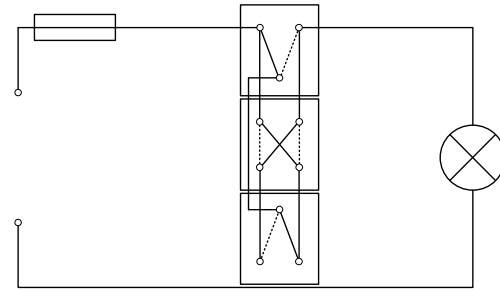
In a domestic situation, we may use a more convenient method for connecting this circuit, although the principle of electron flow remains the same.

The alternative method can also be used to reduce interference although is rarely done so for this reason in a domestic situation.

This would look something like this:



Basic Circuit
With Alternative Two Way Switching
And Protection



Basic Circuit
With Alternative Two Way Switching
And Protection

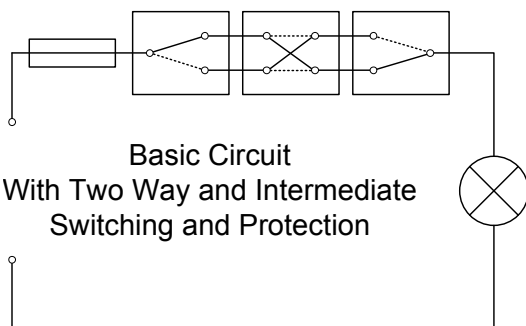
Wiring Diagrams

So we have taken a look at the basic circuit in a circuit diagram form. The circuit diagram is excellent in informing us of the connection of cables to the correct point, what it doesn't do, is tell us how we would *physically* wire the circuit.

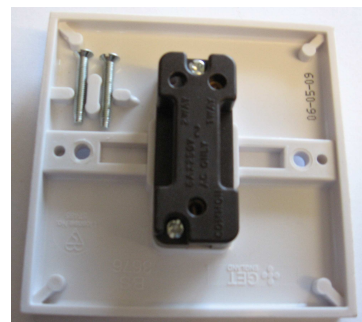
Within a conduit and trunking installation, the circuit diagram would be quite adequate with a little bit of tweaking, however when we wire in multicore cables (like PVC/PVC Twin and CPC) we cannot conveniently break the cable to wire the circuit in such a way. In this instance, a wiring diagram would be a more convenient method of displaying the connections.

Even more switches?

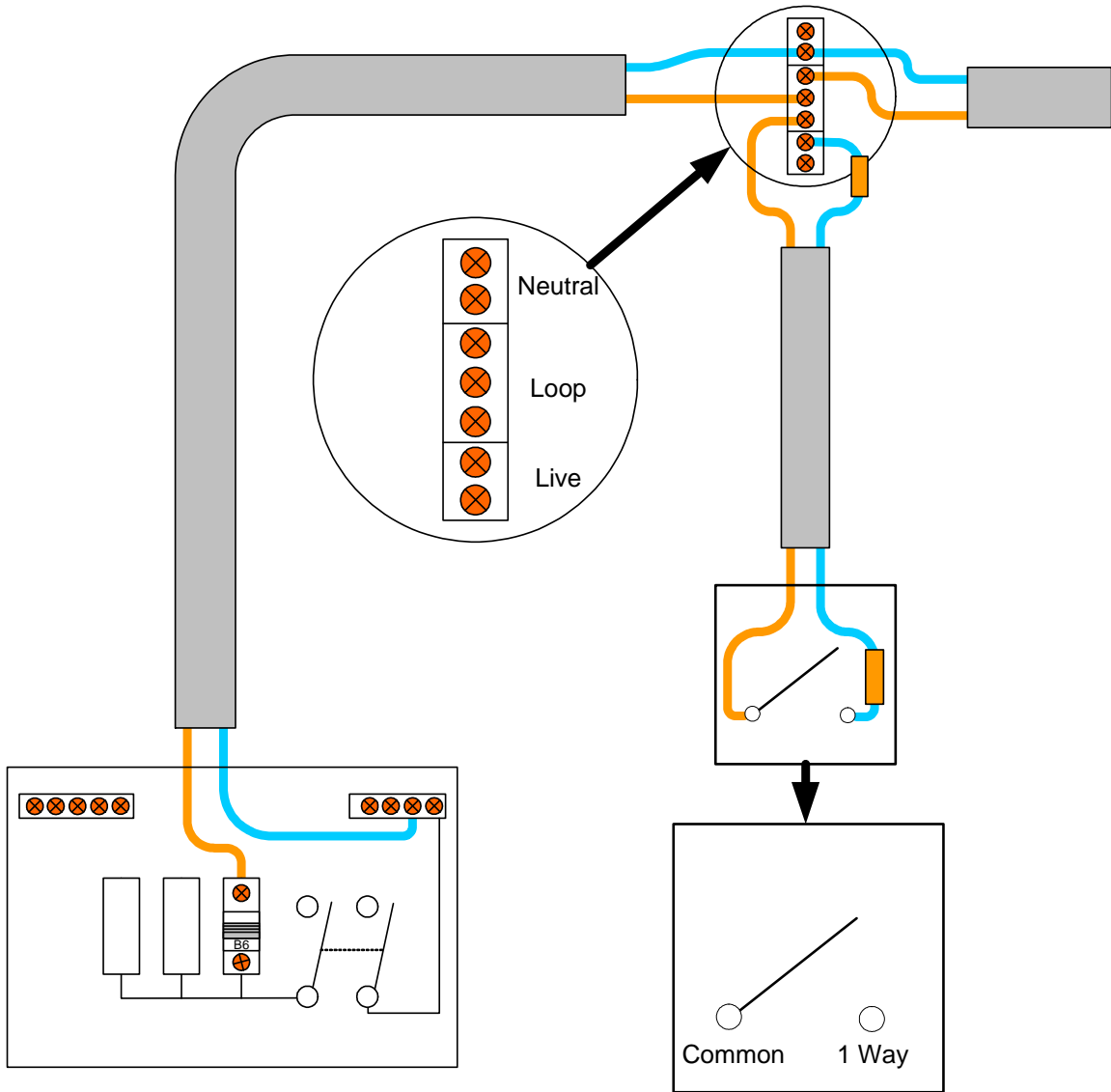
If we wanted to add further switches, we can install what we call an intermediate switch between the 2 ways switches. The intermediate switch breaks the strappers and adds a further control point.



Basic Circuit
With Two Way and Intermediate
Switching and Protection



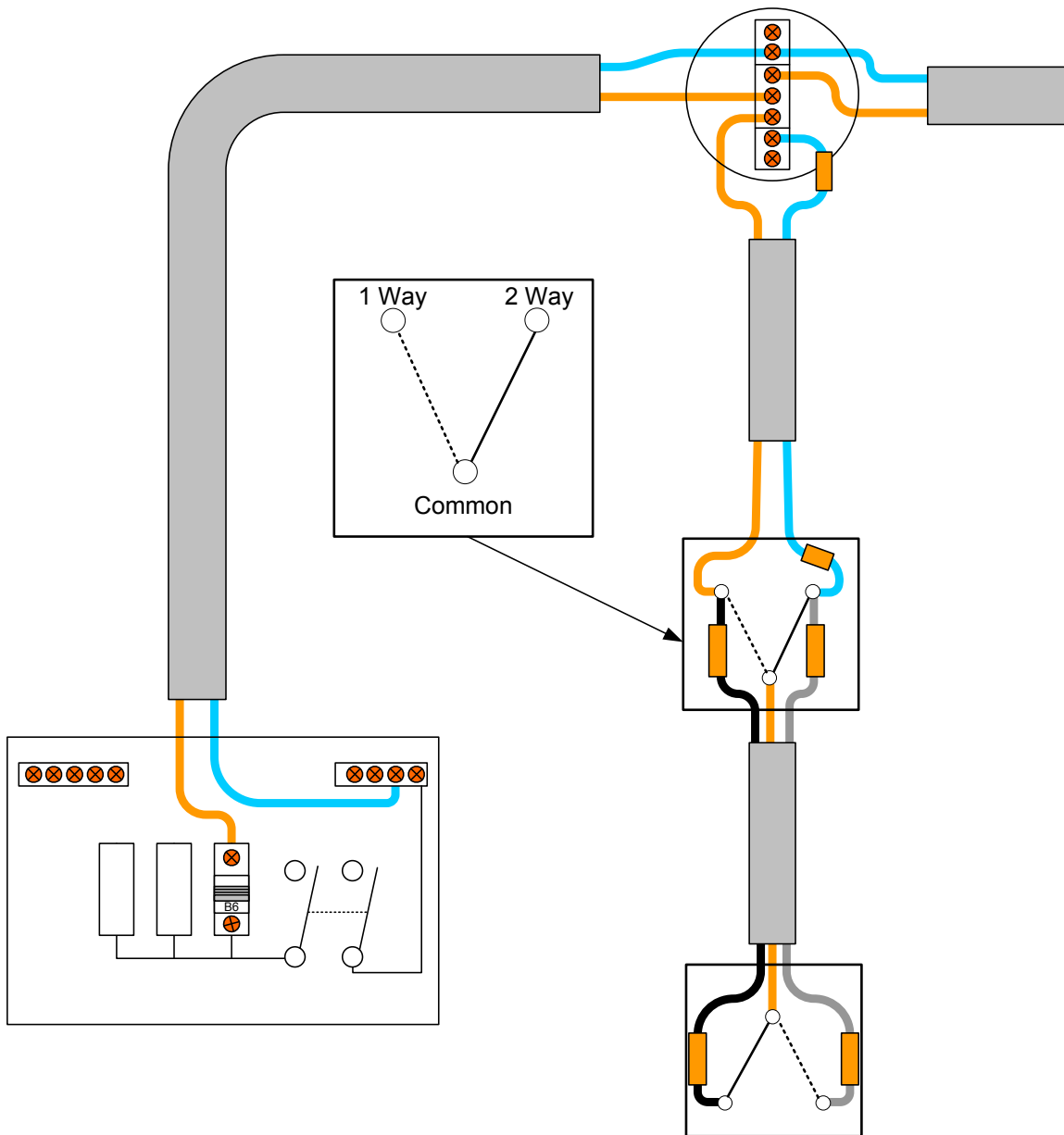
Typical one way switch



The above diagram shows how we would wire a one way switch in a typical domestic situation. Using the system above, it is easy to wire up an installation. The CPC has been removed for clarity.

Notice that the cables have been identified with brown sleeving as being live conductors? That's because in a standard lighting circuit, we only switch the phase conductor and not the neutral.

The two way wiring diagram



Notice again how the cables are identified as being live conductors? This example makes 2 way switching easier to install within a domestic installation as it is quite flexible in its design.