

# Lighting of London Technical Guide



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## Technical Guide



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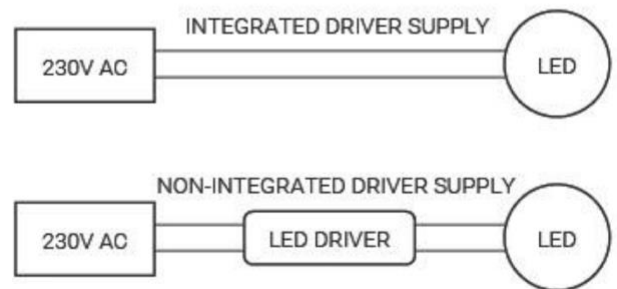
enquiries@lightingoflondon.co

### Do I Need a Driver?

All LED light fittings require a driver.

Some LED light fittings by design already have the drivers integrated such as our "Seek" and "Uno" models. If this is the case then a supply of 230V is all that is required.

In most circumstance LED light fittings will need a driver to be placed between the incoming supply (230V) and the first fitting in the circuit. **If no driver is installed then this will cause permanent damage to the LED**, requiring replacement of the entire LED light fitting.



A compatible LED driver must be used between the switched main supply and the LED light.

### What Driver to Use?

First, we need an example:

Lets say we want to power **9 x Beam.M light fittings.**

Before we start we need to work out some details: (i) the **overall voltage needed** to "drive" the light fittings, (ii) what **load the circuit will draw**, and finally (iii) the **current rating of the fitting.**

- Beam.M requires 3v each, so 9 fittings x 3v each= **27v**
- Beam.M load is rated at 2.1w each, so 9 fittings x 2.1w each= **18.9w**
- Beam.M current is **700mA**

Now we have the information we need to find a suitable driver

Powerbank700.L	Powerbank350.M	Powerbank350.L	Powerbank700XL	Characteristics
25 – 42Vdc <input checked="" type="checkbox"/>	12 - 24Vdc <input type="checkbox"/>	25 - 42Vdc <input checked="" type="checkbox"/>	43 – 70Vdc <input type="checkbox"/>	Output Voltage
17.5w – 29.2w <input checked="" type="checkbox"/>	4.2 – 8.4w <input type="checkbox"/>	8.75 – 14.7w <input type="checkbox"/>	30 – 49w <input type="checkbox"/>	Output Power
700mA <input checked="" type="checkbox"/>	350mA <input type="checkbox"/>	350mA <input type="checkbox"/>	700mA <input checked="" type="checkbox"/>	Output Current

As we can see from this table, **we need to use a Powerbank700.L**

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### **Danger/Warning**

Always remember: **never "overdrive" your fittings!**

Lets say we only connect 3 of our Beam.M fittings to the Powerbank700.L. The driver will now be supplying the fittings with a possible 25Vdc. The 3 x Beam.M have an overall voltage demand of 3 x 3v, or 9v in total, however the driver will be supplying the fittings with over 3 times the rated voltage...**damage will occur!**

### **Types Dimming**

*1-10v or 0-10v*

An analogue dimming method which requires both mains power and control wires to carry the voltage to control the output of the driver. If the driver receives 3v then the lights will dim to 30%, if the driver receives 8v then the lights will dim to 80%. The type of dimming doesn't lend itself to retro fit projects as a control cable needs to be wired to all drivers on each circuit you want to control.

*Phase*

Phase dimming, leading/trailing edge, TRIAC or mains dimming is the most common and easiest dimming method to install. There are two types of phase dimming: leading edge and trailing edge. Trailing edge offers superior performance, with smoother control and silent running when in operation. Take care to ensure that the dimmer switch or control system is suitable for the load of the circuit, as some control systems or dimmer switches require a minimum load to operate.

*DALI*

DALI (Digital Addressable Lighting Interface) is a digital programmable dimming method, usually used in large commercial properties. It requires specialist installation and commissioning. DALI also requires both mains power and control or signal wires between switch and driver.

### **Constant Current or Constant Voltage**

As the term suggests, constant current LED lighting requires the current in the circuit to remain at a constant value in order to operate correctly. Typically, one will see the LED light fittings requiring either 350mA or 700mA, and installers will need to match the driver output to this value accordingly. Constant current circuits are always wired in series.

Constant voltage is usually used when powering LED strip lighting. Again, as the name suggests, the same voltage must be applied across each LED chip in order to operate correctly; 12v or 24v is the typical value.

### **What is Forward Voltage?**

Forward voltage refers to the voltage needed to operate the LED light fitting correctly, if the voltage supplied by the driver is too low the fitting will not work correctly; if the voltage is too high, it will cause damage to the LED light fitting.

If there are multiple LED light fittings together on the same circuit connected to one LED driver, one must add all the forward voltages of all the products together. This value must fall within the forward voltage range of the LED driver.

### **Hot Swapping/ Hot Wiring**

*Lets setup an example:*

We have 1 x Aim70 36° beam fitting we wish to replace with an Aim70 24° beam. The circuit is on, and the 36° fitting is working correctly. At this stage it would be easy to simply unplug the fitting and plug in the 24° fitting, but **never do this** as the driver will be outputting its full voltage of 42Vdc once the fitting is disconnected and, as the Aim70 is rated at 36Vdc, damage will occur.

**Always turn off the power supply to any driver before disconnecting an LED fitting. Most drivers when not connected to a load will produce random voltage output.**