

Garden Lighting Guide



Garden lighting can enhance any outdoor area, but there are few things to consider when planning your garden lighting. This guide will show you how to plan and setup your garden lighting. This relates to the use of both Halogen lighting and LED lighting, as there are differences in the transformers and wiring used.

There are three main aspects to garden lighting:

Lights:

The lights that you choose to light your garden can vary from Garden spotlights, Pond lights, LED Deck lights or Step lights. Each will achieve different lighting effects. When planning which lights you would like to use, it is also worthwhile thinking about how bright each light needs to be as this will have an impact on the transformer size required.

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Transformer / Driver:

Do it yourself garden lighting works on safe low voltage 12Volts to power the individual lights. This is different to the 240Volt power supplied to your house. We use a Transformer or Driver which converts the house power from 240V down to a safe 12Volts. Transformers come in many different sizes. The size required depends on the amount of lights in the system. In this guide we will explain how to choose the right transformer for your needs. Transformers convert the power to 12v AC power which suits halogen lamps, Drivers are the same as transformers but convert the power to 12v DC which is required for the use of some LED lamps.

Wiring:

Wiring is used to carry the power through the garden to each of the lights. The distance to each light from the transformer and the number of lights in the garden all have an effect on the size of the wiring that is required. This guide will look at the correct way to choose the size of cable required for your garden lighting system.

Step 1: Draw a plan.

Draw a rough plan of the Garden lighting desired. You will see below we have provided an example diagram to show what we mean. There is some key information you should mark on your plan:

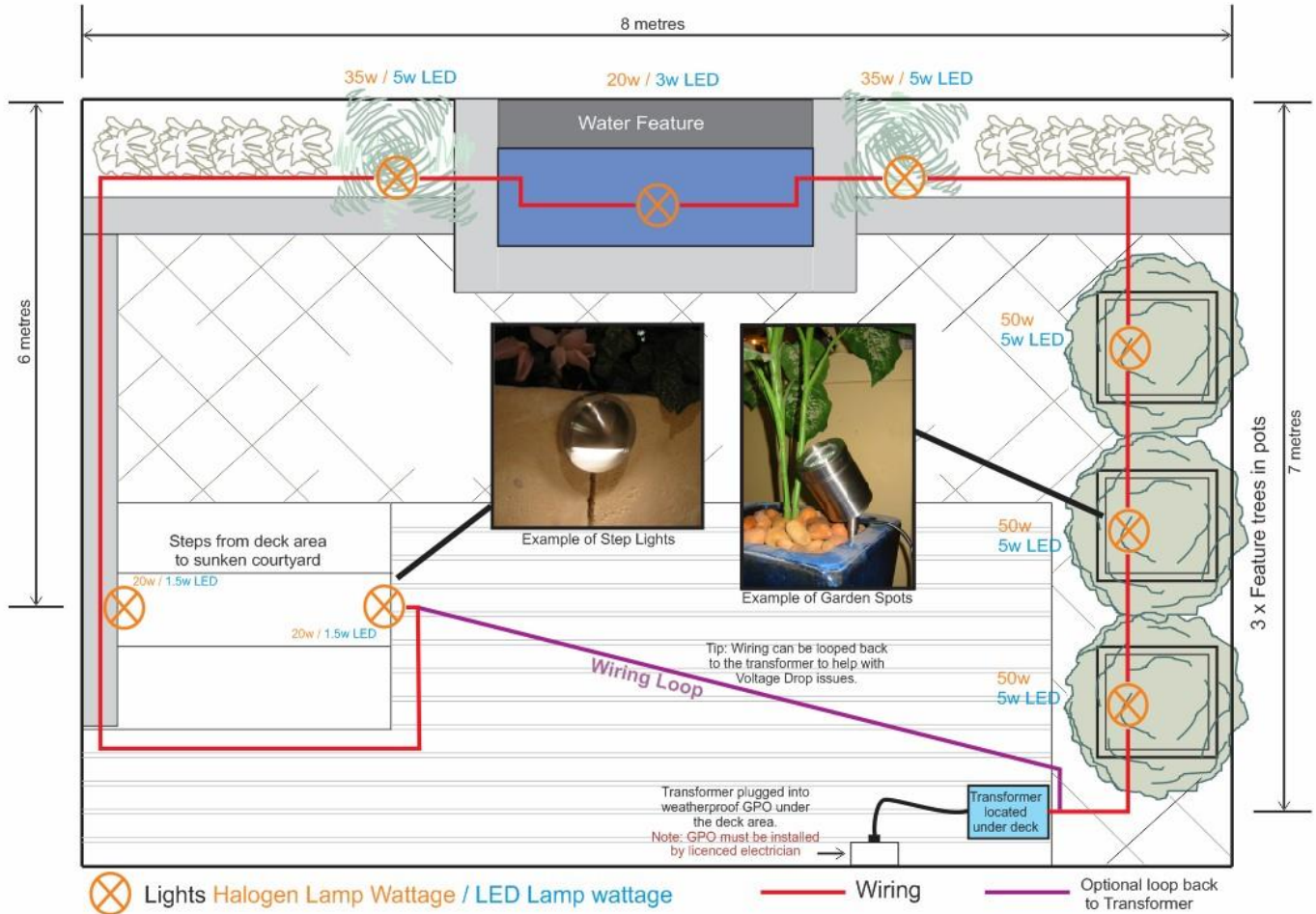
Power: This is usually where the transformer / driver will be located.

Lights: Mark on your plan where you would like the lights to go and what wattage you would like to use in each light.

Wiring: Mark on the plan the path the wiring is to take to get from the transformer each of the lights.

Distance: Calculate the distance to each of the lights from the transformer.

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Step 2: Choose the Lights and the power of each globe.

Your plan from Step 1 will show where the lights are to be located. Now you need to choose the styles of lights. Unfortunately there are far too many styles to list in the handout, however we have all the options on show in our showroom or are listed on our website.

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The important part to choosing your lights is to plan how bright (or what wattage) you would like the lights to be. This is a very important factor in working out the size of the transformer required which you will see is covered in step 3.

Tips: Halogen system: Halogen globes come in various wattages, the same light might have a 10, 20, 35, or 50watt lamp installed in it.

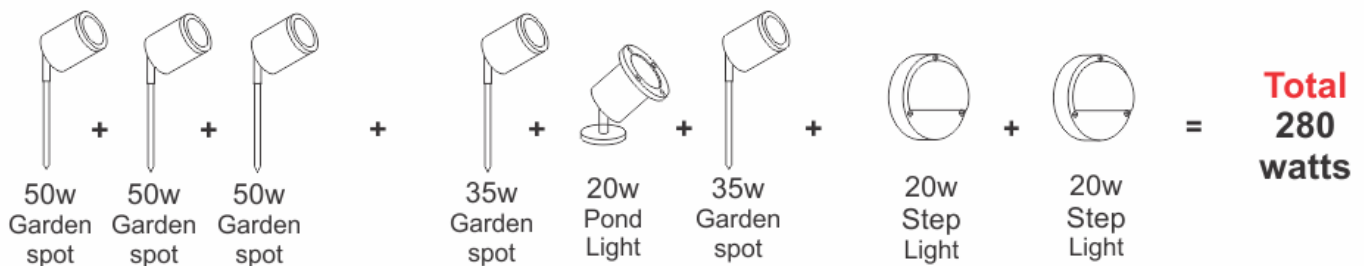
LED System: LED globes also come in various wattages but much lower power, 3, 5 or 9 watt globes are available, but be aware that as the LED globes get brighter they also get bigger. Ensure the LED you choose fits into the light you have selected.

Transformers get more expensive the bigger they get. If you choose the brightest globe and have a number of lights in the garden you may require one of the larger (more expensive) transformers. It can be best to look at the size of the globes you need in each of the lights to keep the transformer to one of the smaller sizes.

Step 3: Transformers / Drivers.

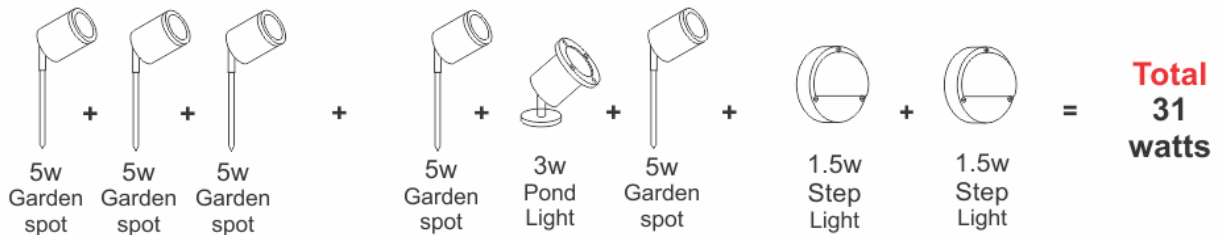
Transformers are needed to change the power from 240 volts down to 12 volts. The size of the transformer depends on the number of lights and the brightness of each of the globes. To work this out simply add the wattages of all the lights in the garden together to obtain the total load the system will draw.

Halogen example:



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LED example:



In the above example you would need a transformer that can power at least 280watts in the halogen example and a Driver to power at least 31watts in the LED example.

Tips: Never exceed the size of the transformer, even overloading the transformer a small amount will cause it to fail or consistently shut down.

The size of a transformer is always marked on it but is commonly written as 300VA instead of 300 watts. VA is the same as watts.

Step 4: Wiring.

Garden cable comes in various sizes, we mainly use 3 sizes:

Light Duty: approx. 2.0sqmm, Medium Duty: approx. 3.3sqmm, Heavy Duty: approx.. 6.0sqmm

In LED systems, the power draw from the driver is usually very low, unless your system uses a driver bigger than 100watts the smallest wire (Light Duty) is all you will need.

In Halogen systems, the size of the cable depends on the size of the transformer, the number of lights and the distance it needs to run. Combined, these factors will affect the performance of the lights.

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Tip: Halogen garden lights can suffer from voltage drop, basically voltage drop is the problem where the light furthest from the transformer does not burn as bright as the light closest to the transformer. This is usually a problem on garden lights that run over a large distance or have many lights on them and use one of the largest sized transformers. The problem is that the voltage running through the system loses some of its power as it reaches the last light. To make sure this problem is kept to a minimum take note of our table below which states which size cable should go with the size transformer and over a particular distance.

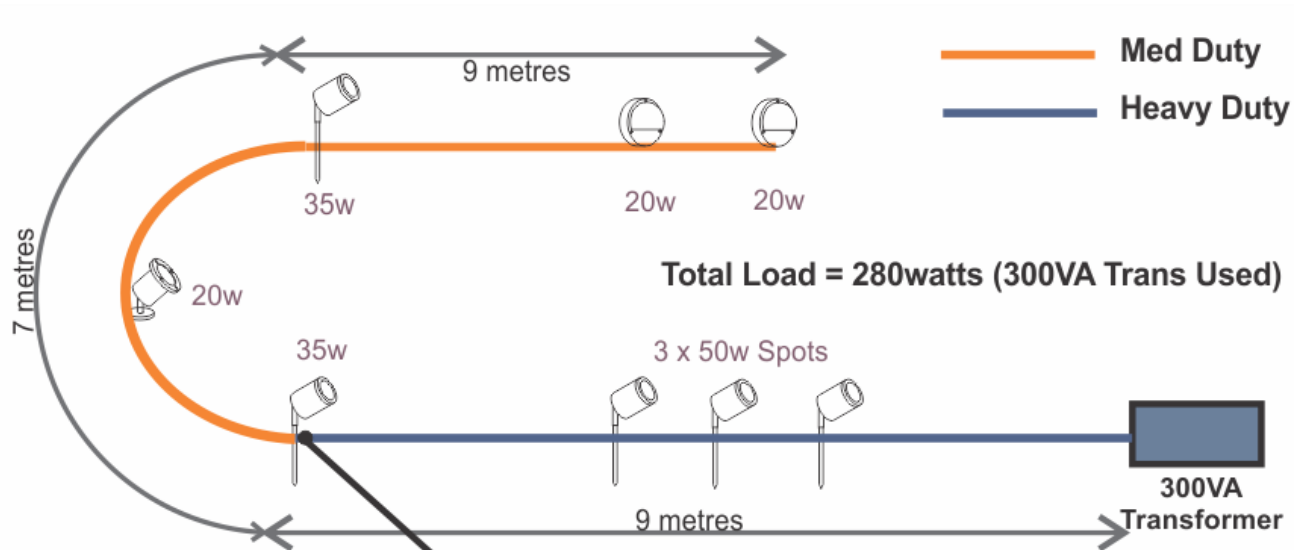
Use this guide to help choose the correct cable

	0-10mts	10-20mts	20-30mts	30mts +
50VA (watts)	Light duty	Light duty	Light duty	Light duty
100VA	Light duty	Med duty	Med duty	Med duty
150VA	Med duty	Med duty	Med duty	Med duty
200VA	Med duty	Med duty	Heavy duty	Heavy duty
250VA	Heavy duty	Heavy duty	Heavy duty	Heavy duty
300VA	Heavy duty	Heavy duty	Heavy (Loop)	Heavy (Loop)
400VA	Heavy duty	Heavy (Loop)	Heavy (Loop)	Heavy (Loop)
Heavy (Loop) This requires the heavy duty cable be looped back to the transformer (See Step 5)				

Using our working example from before we had a total wiring run or 22 metres and we needed to use a 300watt transformer. So the Table above says we should use the heavy duty cable throughout. However the heavy duty cable is the most expensive and there is a way to reduce the cable size to reduce the overall cost of the lighting system.

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The diagram below explains this.



At this point in the wiring the cable can be reduced from Heavy to Medium duty. This is because the total load at this point is $35 + 20 + 35 + 20 + 20 = 130$ watts and the distance is 16metres. From the above chart you can see that Medium duty is sufficient.

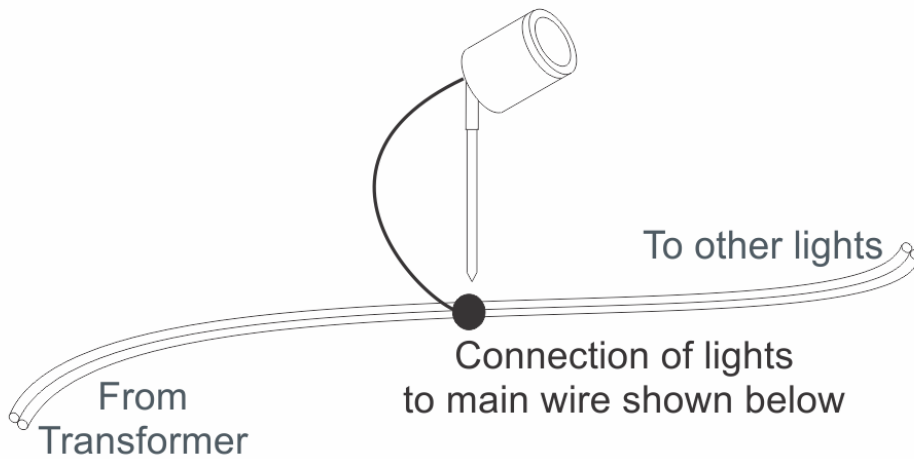
Heavy Duty must still be used for the first 9 metres.

Step 5: Connections.

The connections shown below relate to low voltage garden lighting. The output from a garden Transformer or Driver is safe 12volts and can be done by yourself. Any wiring to power the transformer must be completed by a qualified electrician.

The connection below shows how to connect your garden light to the main wiring from your transformer.

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<p>1.</p> <p>Wiring from transformer</p> <p>Wiring from Garden Spot</p> <p>Wiring to other lights</p> <p>Cut insulation from cable to expose the wire. (Approx 20mm)</p>	<p>2.</p> <p>Twist the wires together</p> <p>The wiring from the lights needs to be connected with each wire from the transformer as pictured.</p>
<p>3.</p> <p>Screw connector</p> <p>Tighten with screwdriver</p> <p>Use a screw connector on the twisted cables. The connector helps keeps the wires connected over time.</p>	<p>Tips:</p> <p>Follow the above procedure for each light in the garden.</p> <p>Multiple lights can be connected at a time, it will simply mean that more than three cables will be joined in the connector.</p> <p>The wires from each light must always be connected to each of the wires coming from the transformer for the light to work.</p> <p>Never join the two main wires from the transformer together. This will short circuit the transformer and cause it to fail.</p>

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