IMPORTANT SAFETY INSTRUCTIONS

- THIS POWER UNIT MUST BE CONNECTED TO A COVERED GFCI RECEPTACLE MARKED "WET LOCATION" WHILE IN USE
- **CAUTION:** FOR USE ONLY ON A BRANCH CIRCUIT PROTECTED BY A CLASS A TYPE GROUND FAULT CIRCUIT INTERRUPTER
- FOR USE WITH LANDSCAPE LIGHTING SYSTEMS ONLY
- LANDSCAPE LIGHTING SYSTEMS ARE FOR OUTDOOR USE ONLY
- POWER SUPPLIES ARE FOR OUTDOOR USE ONLY
- THIS DEVICE IS ACCEPTED AS A COMPONENT OF A LANDSCAPE LIGHTING SYSTEM WHERE THE SUITABILITY OF THE COMBINATION SHALL BE DETERMINED BY CSA OR LOCAL INSPECTION AUTHORITIES HAVING JURISDICTION
- NOT FOR USE IN DWELLING UNITS
- DO NOT CONNECT TWO OR MORE POWER SUPPLIES IN PARALLEL
- DO NOT MOUNT POWER SUPPLY OR FIXTURES WITHIN 3 METERS OF A SWIMMING POOL OR SPA
- DO NOT USE AN EXTENSION CORD WITH THIS POWER SUPPLY
- THE MAIN SECONDARY WIRE CAN BE BURIED NO MORE THAN SIX INCHES DEEP

ENSURE THAT THE TRANSFORMER IS APPROPRIATELY SIZED

The total wattage (W) - or volt-amps (VA) for LED - all the fixtures operated by this transformer must not exceed the wattage rating of the transformer.

If you are powering halogen lamps, calculate the load by adding the wattage of the lamps in the system. Make sure the load does not exceed the wattage rating of the transformer.

If you are powering LED lamps or fixtures, calculate the load by adding the volt/amp (VA) values of all the lamps in the system. VA is calculated using the following formula:

$$VA = \frac{\text{Wattage}}{\text{Power Factor}}$$

If the power factor of the LEDs is unknown, use 0.7 as the value for this calculation. Once you have determined the total wattage or total VA value of the run, make sure that the transformer that you have selected has excess capacity in the event that new fixtures are connected to the system at a later date.

Example: 15 fixtures are each operating a 3W LED lamp with an unknown PF value.

$$\text{System VA} = \frac{15 \times 3}{0.70} = 64.3 \text{ VA}$$

A transformer with a maximum wattage rating of 150W can be utilized.

CALCULATE THE SYSTEM LOAD AND VOLTAGE DROP

Low voltage landscape system voltage drop occurs along the secondary wire and is affected by the distance of the run, the total wattage of the system, and the gauge of the wire. As a result, fixtures at the end of the system's run will receive lower voltage than fixtures near the beginning of the run. Voltage loss can be minimized in different ways.

Low voltage wire is necessary to run from the secondary power on the transformer to the fixtures it will operate in the system. Low voltage wire is measured by gauges. Thinner wire has a higher number and has a lower maximum load. The lower the wire number, the thicker the wire and the more current it can carry. Consequently, thicker wire reduces voltage drop so it is suggested that 8/2, 10/2, or 12/2 wire is used for low voltage landscape lighting systems. Below is a table that lists the cable constant value of different wire gauges:

Wire Gauge	Cable Constant
#14/2	3500
#12/2	7500
#10/2	11920
#8/2	18960

Use the following formula to calculate voltage drop using the distance of the run (transformer to last fixture), the total wattage of the system (load), and the cable constant of the wire listed above:

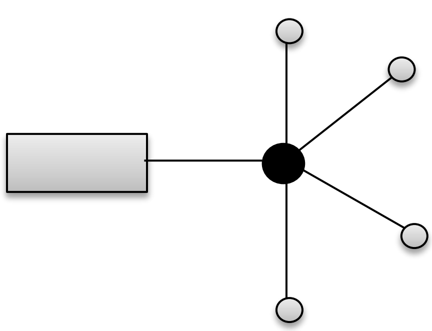
$$\text{Voltage Drop} = \frac{\text{Length of the Run x Load x 2}}{\text{Cable Constant}}$$

Example: A 75 ft. run with 100W load using 12/2 wire

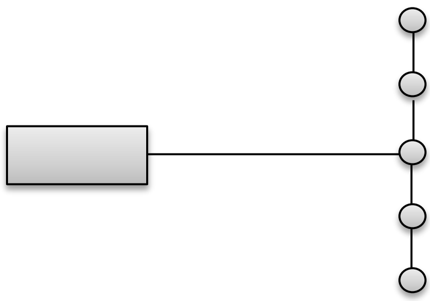
Voltage Drop = (75 x 100 x 2) ÷ 7500 = **2V.** This means that a 14V tap is needed to deliver 12V to the final fixture on the run.

One way to minimize voltage drop in this example is to spread the load to separate wire runs. Wiring the system effectively is another way to minimize voltage drop:

For halogen systems, the **hub method** is the suggested wiring technique used. This entails a single wire from the transformer to a junction box that connects multiple fixtures:

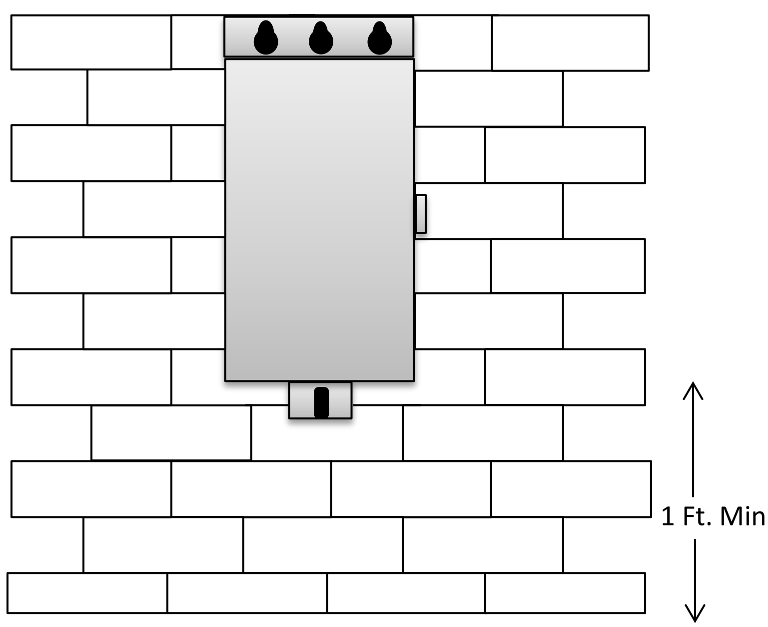


The **T-method** of low voltage landscape lighting wiring connects the transformer to the center fixture and provides better distribution of power to fixtures up and down the run. The T-method is often the suggested wiring technique used for LED systems with input voltage ranges.



MOUNT THE TRANSFORMER UNIT

1) Remove transformer door for easy access.
2) Find a solid, flat surface to mount the transformer in a location:
   a) That is at least 12 inches between the terminals and ground level with wire terminals facing down and
   b) Six feet or fewer from a 120V supply circuit that is protected by a Class A type ground fault circuit interrupter
3) Insert load bearing screws or wall anchors into pre-drilled holes that align with the corresponding keyhole slots on the transformer's mounting brackets.
4) Secure the transformer's keyhole slots on the mounting brackets to the load bearing screws or wall anchors.



CONNECT SECONDARY WIRES TO TRANSFORMER

1) Remove the bottom plate from the transformer.
2) Using a flathead screwdriver, adjust the common tap and appropriate low voltage tap(s) (labeled 12V, 13V, 14V, or 15V) on terminal block to accept secondary wires.
3) Run the secondary wire cables through the knockouts in the bottom plate.
4) Separate the wires from each pair and strip both approximately one inch.
5) Connect one wire from each pair to the common tap and the other wire to the appropriate low voltage tap.
6) Secure the wires to the taps by tightening the common tap and the low voltage taps with a flathead screwdriver.

CHECK VOLTAGE AT EACH FIXTURE

It is very important that the secondary voltage provided to each fixture is within the input voltage range of the lamp or fixture. Halogen lamps and some LEDs have an input voltage rating of 12V. If the specified input voltage range is 12V, the input voltage provided to the fixture must be between 11V and 12V. If the voltage at the socket exceeds 12V, light output of the lamp will be higher but average rated life will be lower. If the voltage at the socket is lower than 11V, light output will be lower and average rated life will be higher. Many LEDs have an input voltage range of 10V to 15V or 10V to 18V. For LEDs with input voltage ranges, input voltage supplied to the lamp within that range is acceptable.

1) Plug the transformer into a covered 120V GFCI receptacle.
2) Switch on the transformer to provide secondary voltage to the fixtures.
3) Using a voltmeter, check the voltage at each fixture.
4) Make sure that the voltage at each fixture is within the specified input voltage range of the lamps or integrated LED fixtures.
5) If the measured voltage falls outside of the specified input voltage range of the lamps or integrated LED fixtures, adjust the voltage to the acceptable range by moving the wire to higher/lower voltage tap.

CHECK OUTPUT AMPS

After checking the voltages on the run, use a clamp-on meter to measure the output current on the low voltage cable at the transformer. Make sure that the output current of the system is below the maximum rated output current:

Model Total Watts	50	100	150	200	300
Max Output Amps	4.17A	8.34A	12.5A	16.67A	25A

CHECK INPUT AMPS

This unit is provided with a looped wire that is attached to the optional photocell plug. Use a clamp-on meter around the looped wire to measure the input current. Apply the clamp on the amp meter around the looped wire to get an input current measurement. Make sure that the input current of the system is below the maximum rated input current:

Model Total Watts	50	100	150	200	300
Max Input Amps	.47A	.84A	1.25A	1.67A	2.5A

If the input current of the system exceeds the max rating of this transformer unit, remove fixtures or reduce lamp wattages until the input current is reduced to an acceptable level.