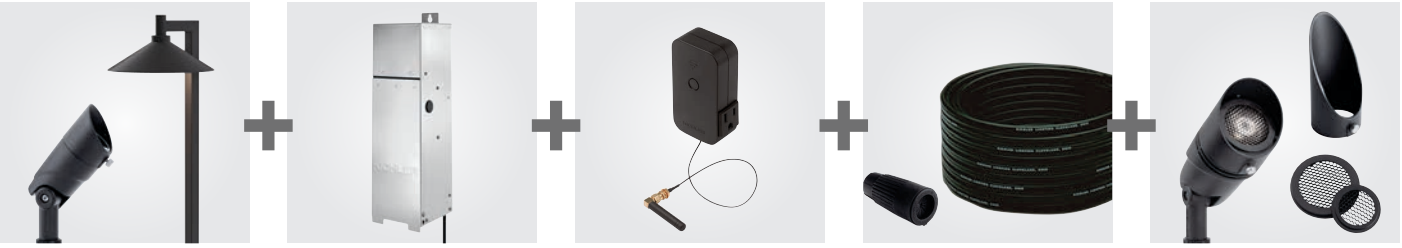
Calculating Project Load & Wire Size

From transformer to fixture selection to calculating your voltage drop, we've laid out the steps to make sure your fixtures have the power they need to light the night right.



Lights | Transformer | Controls | Wire & Connectors | Accessories

Selecting Lights

- Use our landscape lighting techniques section (pgs 18-21) and design tips (pgs 11-17) to select the right fixtures for each application.
- Determine the preferred color temperature, beam spread, and lumen level for each application.
- Determine the type of light you would like to use: drop-in, integrated LED, or adjustable integrated LED (VLO).
- List the wattage and VA fore each fixture in the system.

Choosing a Transformer

- Add the VA values of each fixture to determine total VA of the system.
- The total VA value of the system should not exceed the wattage value of the transformer.

Example: A system totaling 300 VA should use a transformer rated with at least 300 Watts

Transformer Control Options (see pg 49)

- **Photo Cell** – Sensor turns lights on when it gets dark and off when it gets bright outside.
- **Mechanical Timer** – Uses traditional pin setting to automate on and off sequencing.
- **Digital Timer** – Program on/off times for each day of the week and automatically adjusts for daylight savings time.
- **Smart Control Timer (Wi-Fi)** – Schedule and control your lights from your phone or another Wi-Fi enabled device.

Voltage Drop Calculation

Utilize the voltage drop calculation below to select the appropriate wire gauge and to determine the voltage that will be delivered to the last fixture on your wire run. This calculation should be done on each wire run to ensure safe and effective operation.

End Fixture Voltage = Transformer Tap Voltage – (Total Watts x Length of Wire / Wire Constant)

- **Transformer Tap Voltage** – Varies by transformer and can be 12V, 13V, 14V or 15V.
- **Total Watts** – The total wattage of each fixture that will be installed on an individual wire run
- **Length of Wire** – The length in feet of an individual wire run.
- **Wire Constant** – Predetermined value, see chart below. We recommend starting with 12 gauge and adjusting if necessary.
- **End Fixture Voltage** – Should be greater that 10V to ensure effective operation.

Calculation Example

Transformer Tap Voltage	14V
Total Watts on run	75 Watts
Length of Wire (ft)	85 Feet
Wire Constant (see chart)	7,490

End Fixture Voltage: 14V – [75W x 85' / 7,490] = **13.15V**

Wire Constants

18 gauge	1,380
16 gauge	2,200
12 gauge	7,490
10 gauge	11,920
8 gauge	18,960

What if your number is less than 10V?

- If possible, select the next highest voltage tap and recalculate.
- Decrease the load (eliminate fixtures) on the wire run and recalculate.
- Increase the wire gauge and recalculate.

We don't accept responsibility for any missuses or misunderstanding of the wire size calculations. We always recommend utilizing a voltmeter to confirm your calculations.