Solatube Integrated LED Light Kit

(Powering and controlling guidelines)

Power

The LED light kit can be powered over a wide range of voltages: 120-277 Vac. The voltage and circuit size will dictate the number of units per circuit. You need to consider two calculations when determining the number of Solatube Integrated LED Light Kits that can be connected per circuit breaker: Steady-state current and inrush current.

Steady-state current

Calculating the steady-state current unit maximum:

To calculate the steady-state current unit maximum, take the light kit wattage and divide it by the working voltage. For example, the 330/750 DS integrated light kit consumes 75 watts and is connected to a 277V circuit:
Below are the wattages for both the 290 DS / 300 DS & 330 DS / 750 DS Integrated LED Light Kits.

$$\frac{75Watts}{277V} = 0.27\ Amps$$

Solatube 290 DS / 300 DS Integrated Light Kit = 25 watts

Solatube 330 DS / 750 DS Integrated Light Kit = 75 watts

Next, divide 60% of the circuit breaker capacity by the LED Light Kit current draw. For example, a 277 V circuit rated to 20 amps is connected to the Solatube 330 DS / 750 DS LED Light

$$\frac{20\ Amps\ X\ 60\%}{0.27\ Amps} = 44\ Units$$

This means a maximum of 44 units can be connected to the 277Vac 20-amp circuit.

Note: loading the circuit to only 60% leaves 20% for added loads in the future and 20% safety margin.

Inrush current

We now need to calculate the maximum units based on inrush current. When the LED Light Kit is first switched on, the LED Driver causes a large start-up current (Inrush current) that only lasts approximately 350 microseconds (0.00035 sec).
Below are the inrush current draws and duration for two Solatube LED light kits.

Solatube 290 DS / 300 DS Integrated Light Kit = 50A (*Twidth*=350µs)

Solatube 330 DS / 750 DS Integrated Light Kit = 50A (*Twidth*=300µs)

Next, find the maximum inrush current capability of the circuit breaker at the twidth time for the unit being used. Then take the circuit breaker inrush current capability and divide it by the light kit inrush current. For example, for a 20-amp circuit breaker with a tripping current of 1000 amps at 0.00035 seconds, when installing the 330/750 DS Integrated Light Kit:

$$\frac{1000A}{50A} = 20\ Units$$

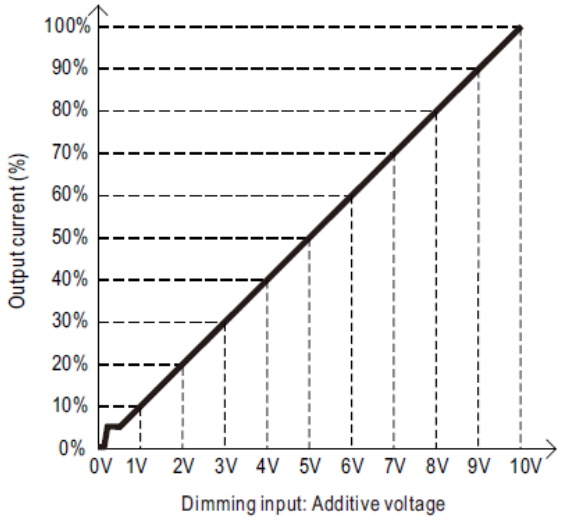
This means a maximum of 20 units can be placed on this 20-amp circuit breaker.

Now, compare the maximum units the circuit can support for steady-state current and inrush current. Take the lower of the two numbers. For example, if we calculated 44 units for steady-state current and 20 units for inrush current, we would only place 20 units maximum on this circuit.

Dimming control 0-10V

The LED drivers can be connected to any third-party 0-10V DC current-sinking controller. The LED driver provides 10V DC and a return ground wire. The controller reduces the returned voltage. If the controller returns the full 10V, the light will be at its brightest level. If no volts are returned, the light will be at its minimum level. The 0-10V signal wire can be daisy-chained to each driver. To calculate the number of units that can be connected to one 0-10V controller, take the controller's sinking ability in mA (found in a datasheet) and divide it by 0.1mA.

Controller (0–10 V Sink Capacity)	Solatube 290 DS / 330 DS or 330 DS / 750 DS Integrated LED Light Kit units per controller
DVTV (50 mA)	500 units



Note: The Solatube Integrated LED Light Kit can only be controlled by a sinking controller. If the controller is sourcing the 0-10V signal, the LED light kit will not dim properly.