



Emergency LED Drivers



What is Constant Power?

Constant Power (or "CP") is a term used by IOTA to identify emergency LED drivers that deliver a consistent output wattage to the LED load while operating in the emergency mode. The advantage of delivering constant wattage is that the LED array will illuminate in direct proportion to the wattage, or power, it is given. If the wattage remains the same, illumination levels also remain the same. Conversely, if the wattage were to decrease, then LED illumination must also diminish. The patented Constant Power circuitry of IOTA emergency LED drivers is an improvement over traditional *constant current* emergency driver types that force wattage to drop as battery voltage decreases. This function is illustrated in Joule's Law as " $P = I \times E$ " where P = watts, I = current, and E = volts. In a constant current scenario, as battery voltage decreases, wattage must also decrease to maintain a consistent output current value. The specialized design of IOTA "CP" emergency drivers, however, manipulates the output as battery voltage drops, ensuring that wattage does not change and there is no change in emergency LED illumination.

Identifying True Constant Power

IOTA emergency LED drivers that feature the patented constant power performance are easily recognized by the presence of 'CP' in the model name. It is important to note that not all emergency LED drivers provided by other manufacturers deliver constant power output, despite claims to the contrary. Some constant power claims are due to either a simple lack of understanding of how LEDs operate or they classify the output as 'regulated' which means that the output power is only constant for a limited amount of time but is then reduced to protect battery discharge. Refer closely to emergency driver specifications – if the amperage of the emergency driver states a single value, then it is impossible for the output wattage to remain constant.

Achieving Required Foot-Candles Along the Path of Egress

Maintaining constant illumination along the path of egress provides many advantages. First, non-diminishing illumination ensures the lumen levels provided by a properly specified emergency driver never drop below the minimum foot-candles required by national and local safety codes. Violating these minimums can incur fines and penalties from the authorities having jurisdiction, but more importantly, can also place families and loved ones at risk during an emergency. Two factors can impact the emergency lumen output levels of a fixture: the first is the decrease in battery voltage as it discharges as noted above, and second, is the age of the LED components which naturally lose efficacy over time. While some degradation is allowable by code during the runtime duration, having constant power output provides additional protection against dropping below the minimum threshold for the safety of the building's occupants. Another advantage of constant power is potential cost-savings by eliminating the need for 'over-sizing.' In order to achieve the necessary minimum foot candles required at the end of the run-time, a *constant current driver* must provide additional power at the initial output. For example, if a specifier determines a path of egress fixture would require a minimum 5W at the end of the runtime, then a higher wattage (ie. higher priced) constant current driver would need to be purchased to ensure 5W of power can be delivered at Minute 90 of emergency operation. A *constant power* emergency driver, however, does not need to be 'over-sized' to accommodate this decline.

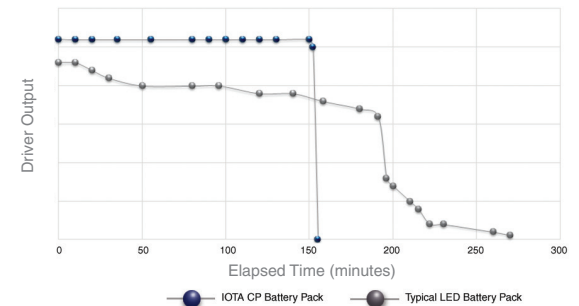
Confident Performance Evaluation and Project Specification

Constant Power emergency drivers offer ease of specifying by eliminating the question marks of varying lumen outputs. By simply multiplying the unchanging wattage value of the CP emergency driver with the luminaire efficacy (lumens per watt) of the specified fixture, the fixed emergency lumen output is quickly determined. To make the process even simpler, IOTA offers an on-line calculator at www.iotaengineering.com/cptools for easily comparing available lumen packages for the fixture's efficacy rating.

True Constant Power (CP) Emergency LED Drivers

- Deliver constant wattage to the LED array
- Provide non-diminishing light output for the full emergency runtime
- Simplify the specification process
- Help prevent falling below ft-candle levels required by local and national codes

The illumination level of the LED is directly related to the wattage it receives. IOTA CP emergency drivers deliver constant wattage to prevent diminishing emergency output.



Since wattage does not change, specifying the optimal IOTA CP emergency driver for the desired lumen level is easily calculated by multiplying the fixed output by luminaire efficacy (lumens per watt).



www.iotaengineering.com/cptools

Using the IOTA On-Line Calculator allows specifiers to enter luminaire efficacy and instantly compare lumen and drive current across IOTA emergency driver options.