

# SELECTION GUIDE OF EMERGENCY BATTERY KIT FOR LED

LED lamp is one of the most energy-efficient and rapidly developing lighting technologies in the lighting industry, and becoming popular in Hong Kong and all over the world. Almost all LED lamps with remote LED driver could be equipped with emergency battery kit. For LED lamps with integral LED driver, the lamp could be equipped with emergency battery kit with maximum wattage around 30W.

## LED Classification

Category	Characteristic	Page
Integral LED Driver	W-LED : Modified Sine Wave	21-22
	M-LED : Square Wave	23-24
	P-LED : Pulse DC Voltage	25-26
	Y-LED : Constant Voltage	27-28
Remote LED Driver	Constant 12V type for MR16 and AR111	29-30
	R-LED : Constant current type (mA)	31-32

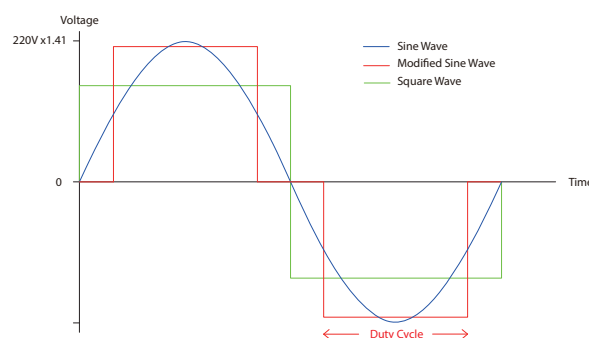
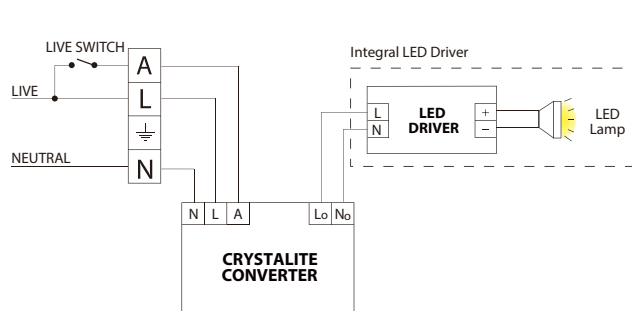
**Remark: Integral LED driver type LED Lamps and tube always require samples for testing.**

## Dimming consideration

For remote LED driver type LED Luminaire, the dimming control of LED driver is not effective in emergency mode since the emergency battery kit will bypass the LED driver and directly output to LED lamp. However, integral LED driver type LED Luminaire with dimming control cannot be isolated from emergency battery kit and the dimming function should be disabled during emergency mode of operation. Therefore, an external relay is adopted to cut off the dimming signal for those 1-10V, DALI and others dimming control.

## Integral LED Driver

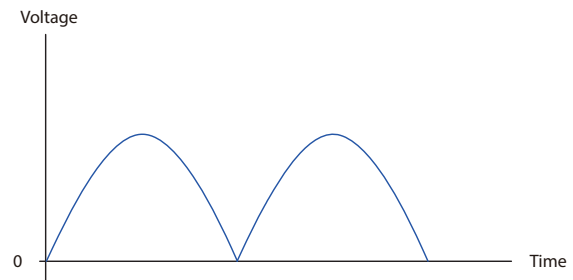
In Hong Kong, electrical power supply is a Sine wave 220Vac in 50Hz. Most of the LED Lamp manufacturers had designed the LED products to fit the power supply with power factor, inrush current and efficiency. However, the self-contained emergency lighting may not directly be adopted because the battery kit cannot generate a true Sine wave itself.



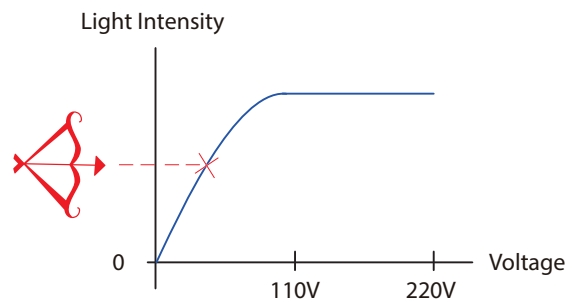
**Modified Sine Wave (Whale LED Series W-LED)** has the highest compatibility to LED lamp. Almost 97% of LED Lamps tested by CRYSTALITE are working well with W-LED series emergency battery kit. Generally speaking, pulse-width modulation with 80% (W-LED-80) duty cycle could be transformed to simulate modified Sine wave and the LED lamps will run on 100% light intensity. If the LED lamp can be function as triac dimmer, 50% (W-LED-50) or 30% (W-LED-30) of duty cycle can be used and so the light intensity in emergency mode will be dimmed with smaller battery capacity.

**Square Wave (Mega LED Series M-LED)** cover a wide range of LED lamps. The advantage is M-LED series could tolerant high inrush current from LED driver. Since an external transformer is required in battery kit, the size of the battery kit is relatively larger than W-LED series. Also, for 1-10V integral LED driver, M-LED-DK Series can perform better dimming control in emergency mode of operation.

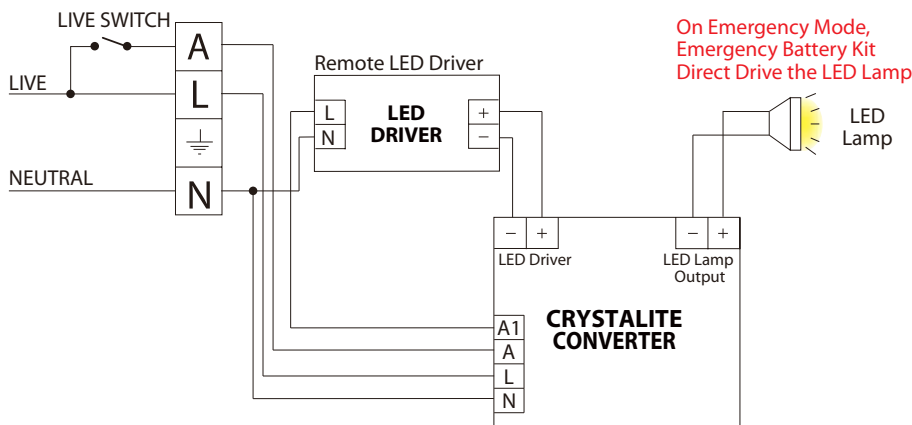
**Pulsed d.c. Wave (P-LED Series)** is designed for economic purpose by trial and error methodology. The principle is to limit the maximum voltage and current flow to LED. Some of the LED Lamps and tubes perfectly match with P-LED series even though there is no dimming function on declaration of the LED lamp. The drawback is a complete compatible test is required.



**Constant d.c. Voltage (Yoke LED Series Y-LED)** is an advanced methodology to dim the LED lamps for economic purpose. Some of the LED lamp manufacturers had designed their products with 100% light intensity on 110V-240Vac input for worldwide market. The principle of Y-LED Series is looking up the turning point of d.c. voltage of LED lamp and intensity, locate the optimal point of d.c. voltage and implement the emergency lighting with high accuracy on specific voltage.



## Remote LED Driver



### Example One: 12W LED Lamp with 350mA remote LED driver

According to Ohm's Law:  $V=IR$  and  $P=VI$

$P=12W$ ,  $I=350mA$ ,  $V=P/I=34.29V$  which is inside the range of CC-R24-LED

If the Power Selection be 5W, the Ballast Lumen Factor (BLF) will become  $5W/12W = 41.6\%$  light intensity of normal supply  
For 2 Hours duration, the model become CC-R24-LED-5-K2

### Example Two: 30W LED Lamp with 700mA remote LED driver

$P=30W$ ,  $I=700mA$ ,  $V=P/I=42.86V$  which is inside the range of CC-R48-LED

If the Power Selection be 8W, the Ballast Lumen Factor (BLF) will become  $8W/30W = 26.7\%$  light intensity of normal supply  
For 3 Hours duration, the model become CC-R48-LED-5-K3



SELF-CONTAINED EMERGENCY LIGHTING SYSTEM  
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