LED Driver

EUCI PRO Series

EUCI PRO

Highlights & Features

- DALI-2 certified LED driver, 2.5%-100 % dimming range
- Flexible configurable operating windows (AOC) via NFC, DALI or i-Programmer
- Integrated 12VDC/100mA auxiliary power supply
- Robustness protection against vibration, harsh operating temperature and moisture
- Autonomous dimming includes three “Smart Timer Dim” operation modes with five independent levels: Fixed Timer, Midnight Centric Timer, and Ratio Rescale Timer
- Override function is used to force the output dimming to maximum in any of Smart Timer Dim modes at any given time when AC mains are shorted to DALI port
- High Efficiency (Up to 93%)
- High surge immunity (CM/DM)
- Design and fix for luminaires of protection class I and protection class II

Safety Standards

- 40W&75W

SELV

- 130W&170W

Dimensions (L x W x H):

EUCI-040105GLA EUCI-075105GLA	133.0 x 77.0 x 40.0 mm (5.24 x 3.03 x 1.57 inch)
EUCI-130105GLA	150.0 x 90.0 x 40.0 mm (5.91 x 3.54 x 1.57 inch)
EUCI-170105GLA	170.0 x 100.0 x 40.0 mm (6.69 x 3.94 x 1.57 inch)

General Description

Delta LED drivers come in different series to suit different application needs. The EUCI PRO series features program output current level. EUCI PRO series offers the capability to achieve different level of LED brightness via built-in DALI-2 function to meet various application and energy optimization needs. The products are designed and rigorously tested to work with various outdoor LED lighting conditions. Featuring high surge immunity (CM: 8kV, DM: 6kV) make Delta EUCI PRO series an essential part of an energy efficient LED lighting power solution for both indoor and outdoor applications.

Model Information

EUCI PRO LED Driver

Model Number	Input Voltage Range	Rated Output Voltage	Program Output Current Range	Constant Power Current Range
EUCI-040105GLA	220-240Vac Typical 198-264Vac Range	28-77Vdc	200-1050mA	520-1050mA
EUCI-075105GLA		54-110Vdc	350-1050mA	680-1050mA
EUCI-130105GLA		60-200Vdc	350-1050mA	650-1050mA
EUCI-170105GLA		80-340Vdc	350-1050mA	550-1050mA

All parameters are specified at 25°C ambient for all products unless otherwise indicated.

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EUCI PRO Series

Model Numbering

EU	C	I	–	□□□	□□□	G	L	A
Safety Approval CE, ENEC	Constant current	Indoor		Output Power 040–40W 075–75W 130–130W 170–170W	Output Current 105–1050mA	Programmable output current + 12V/100mA	Control type – DALI-2	A – Standard

Specifications

Model Number	EUCI-040105GLA	EUCI-075140GLA	EUCI-130105GLA	EUCI-170105GLA

Input Ratings / Characteristics

Normal Input Voltage		220-240Vac			
Input Voltage Range		198-264Vac			
Normal Input Frequency		50-60Hz			
Input Frequency Range		47-63Hz			
Max. Input Current	220Vac	0.25A	0.4A	0.67A	0.8A
Efficiency [1]	230Vac	90% @ 0.7A	91.5% @ 0.7A	93% @ 0.7A	93% @ 0.7A
	230Vac	91% @1.05A	92.5% @ 1.05A	92% @ 1.05A	92% @ 1.05A
Inrush Current (Apk / 50% - uS @ Cold Start)	230Vac	65A/250uS	65A/250uS	10A/250uS	10A/250uS
Max. No. of LED Drivers circuit breaker @ 230Vac	B16	8pcs	8pcs	15pcs	14pcs
Power Factor		> 0.95 @ 230Vac, 100% load ; > 0.90 @230Vac, 50% load			
Total Harmonic Distortion		THD < 10% with 100% load @ 230Vac THD < 20% with load ≥ 50% @ 230Vac			
Leakage Current		< 0.7mA peak @ 240Vac			
Standby Power		0.5W @ Dim to off, 230Vac			
Input Over-Voltage		Can survive input over-voltage stress of 320VAC for 48 hours and 350Vac for 2 hours			

1) 100% Load (typical) and tested after 30 minutes warm up.

Output Ratings / Characteristics

Output Voltage Range	28-77Vdc	54-110Vdc	60-200Vdc	80-310Vdc
Max. No Load Output Voltage	85V	120V	250V	350V
Output Power Range	40W	75W	130W	170W
Adjustable Output Current (AOC)	200-1050mA	350-1050mA	350-1050mA	350-1050mA
	With steps of 1mA, configurable via software			
Minimum Output Current	35mA (Min dim level)			
Current Accuracy	± 5% @0.35A~1.05A ; ± 15% @35mA~0.35A			
Line Regulation	± 1% (@ 220-240Vac)			
Load Regulation	± 3% (@ Min-Max output voltage)			
Output Current LF Ripple	5% (ripple = peak-average/average) at full load, (<100Hz)			
Start-up Time	660~1000ms max. (@ 220-240Vac)			

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EUCI PRO Series

Model Number	EUCI-040105GLA	EUCI-075140GLA	EUCI-130105GLA	EUCI-170105GLA

Mechanical

Casing		Plastic, Color : Black		
Dimensions (L x W x H)	[mm]	133.0 x 77.0 x 40.0	150.0 x 90.0 x 40.0	170.0 x 100.0 x 40.0
	[inch]	5.24 x 3.03 x 1.57	5.91 x 3.54 x1.57	6.69 x 3.94 x 1.57
Unit Weight	[kg]	0.61	0.75	0.93
	[lb]	1.34	1.65	2.05
Cooling System		Convection		
Input connector :		Terminal, 2-pole (Line/Neutral) Conductor 0.5~2.5 mm² Strip length 10…11mm	Terminal, 2-pole (Line/Neutral) Conductor 0.5~2.5 mm² Strip length 10…11mm	
Control connector		Terminal, 2-pole (DALI1/DALI2) Conductor 0.5~2.5 mm² Strip length 10…11mm Terminal, 2-pole (Spacer/EUQI) Conductor 0.5~1.5 mm² Strip length 8.5…9.5mm	Terminal, 4-pole (DALI1/DALI2/Spacer/EUQI) Conductor 0.5~1.5 mm² Strip length 8.5…9.5mm	
Output connector		Terminal, 6-pole (Vaux,PRG NTC/GND/Rset/LED+/LED-) Conductor 0.5~1.5 mm² Strip length 8.5…9.5mm	Terminal,6-pole (Vaux,PRG_NTC/GND/Rset/LED+/LED-) Conductor 0.5~1.5 mm² Strip length 8.5…9.5mm	
Noise (30cm distance)		Sound Pressure Level (SPL) < 24dBA		

Environment

Ambient Temperature	Operating	-40°C to +60°C	-40°C to +55°C		
	Storage	-40°C to +85°C			
Maximum Case Temperature		+85°C	+85°C	+85°C	+90°C
Lifetime @ tc		+85°C	+85°C	+85°C	+90°C
Relative Humidity	Operating	10 to 90% RH (Non-Condensing)			
	Storage	5 to 95% RH (Non-Condensing)			

Protections

Over Voltage	90Vrms	120Vrms	250Vrms	360Vrms
	Auto-Recovery when the fault is removed			
Overload / Overcurrent	Reduce output current. Auto-Recovery when the fault is removed			
Short Circuit	Auto-Recovery when the fault is removed			
Over Temperature	Reduce output current. Auto-Recovery when the fault is removed			
Ingress Protection Classification	IP20			
Suitable for Luminaires Class	Class I/Class II. Insulation Class according to IEC 60598			

Reliability Data

Lifetime	50,000 hours @ lifetime case temperature
MTTF	1000,000 hours @Ta=+55°C (as per Telcordia SR-332, total failure rate less than10%)

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Safety Standards / Directives

Electrical Safety	IEC 61347-1, IEC 61347-2-13 (Built in) EN 61347-1, EN 61347-2-13 SELV for 40W,75W			
CE	In conformance with EMC Directive and Low Voltage Directive			
Material and Parts	RoHS Directive 2011/65/EU Compliant			
Galvanic Isolation	Mains	EQUI	LED+NTC+AUX	DALI
Mains	N/A	Double	Double	Basic
EQUI	Double	N/A	Double	Double
LED+NTC+AUX	Double	Double	N/A	Double
DALI	Basic	Double	Double	N/A

EMC

Emissions (CE & RE)	Compliance to EN 55015 Class B;	
Immunity	Compliance to EN 61547	
Electrostatic Discharge	IEC 61000-4-2	Air Discharge: 8kV Contact Discharge: 4Kv Criteria A1) or Criteria B2)
Radiated Disturbances	IEC 61000-4-3	80MHz-1GHz, 3V/m with 1kHz Sine Wave / 80% Modulation Criteria A1)
Electrical Fast Transient / Burst	IEC 61000-4-4	1KV, Criteria A1) or Criteria B2)
Surge	IEC 61000-4-5	Common Mode3): 8kV; Differential Mode4): 6kV, Criteria A1) or Criteria B2):
Conducted Disturbances	IEC 61000-4-6	50kHz-80MHz, 3Vrms ,Criteria A1)
Power Frequency Magnetic Fields	IEC 61000-4-8	3A/Meter, Criteria A1)
Voltage Dips	IEC 61000-4-11	100% dip; 0.5 cycle , Criteria A1) or Criteria B2) 30% dip; 10 cycle, Criteria A1) or Criteria B2)
Harmonic Current Emission	IEC 61000-3-2	Class C (230Vac @ ≥ 50% load)
Voltage Fluctuation & Flicker	IEC 61000-3-3	

1) Criteria A: Normal performance within the specification limits
2) Criteria B: Temporary degradation or loss of function, which is self-recoverable
3) Asymmetrical: Common mode (Line to earth)
4) Symmetrical: Differential mode (Line to line)

Default Settings of the Driver (can be changed with programmable tools)

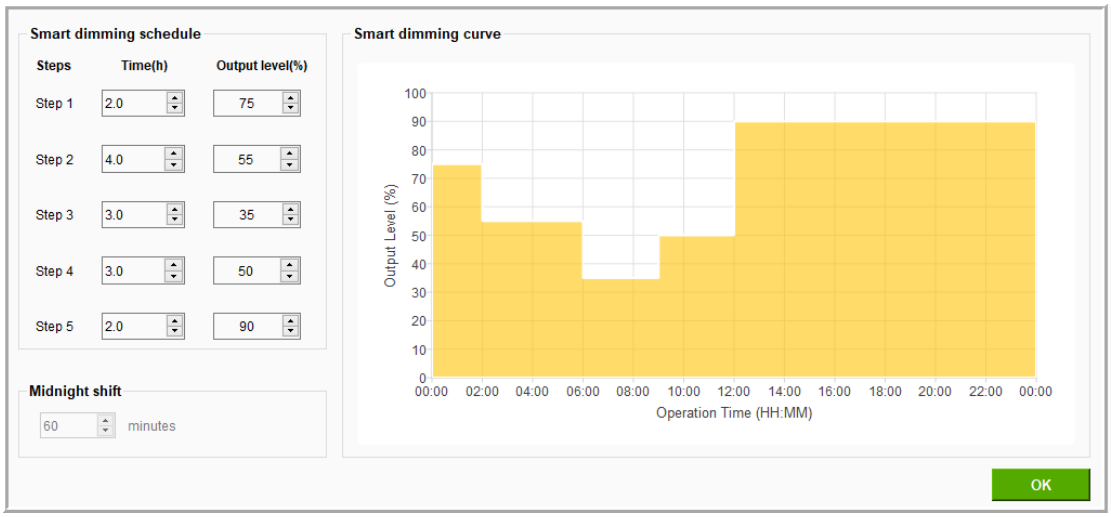
Adjustable Output Current (AOC)		700mA	700mA	700mA	700mA
Smart Timer DIM		Disabled. Settable though programmable tools			
Module Temperature Protection (MTP)		Disabled. Settable though programmable tools			
Constant Lumen Output (CLO)		Disabled. Settable though programmable tools.			
End of Life indication (EOL)		Disabled. Settable though programmable tools			
Auxiliary Output Voltage	+12V Output Range	+12Vdc (10.8 – 13.2Vdc)			
	+12V Output Current	100mA			
	Maximum Output Power	1.2W			

DALI Specification

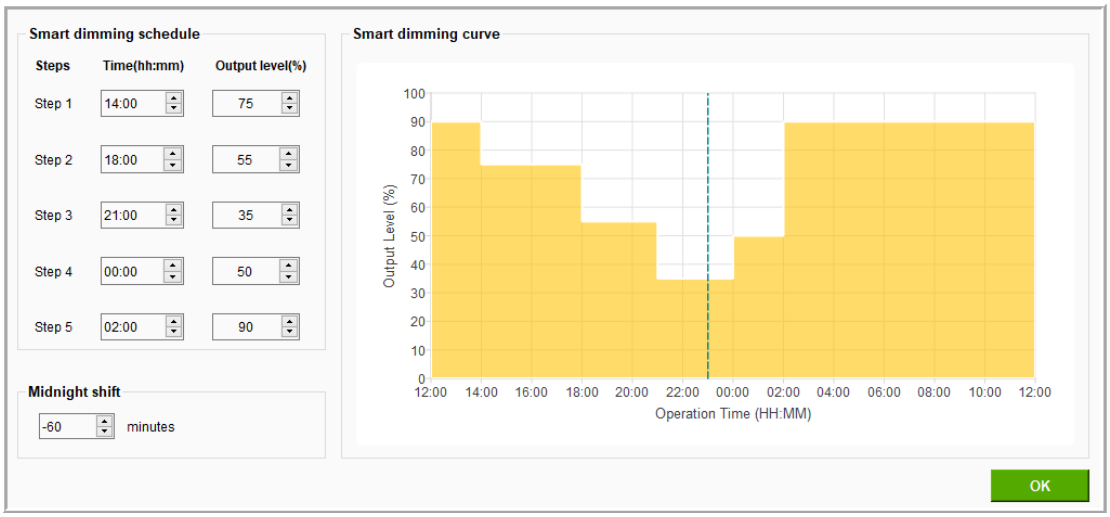
Dimming range	10-100% duty
Standards	EN 62386-101 EN 62386-102 EN 62386-207

"Smart Time Dim" provides three operation modes

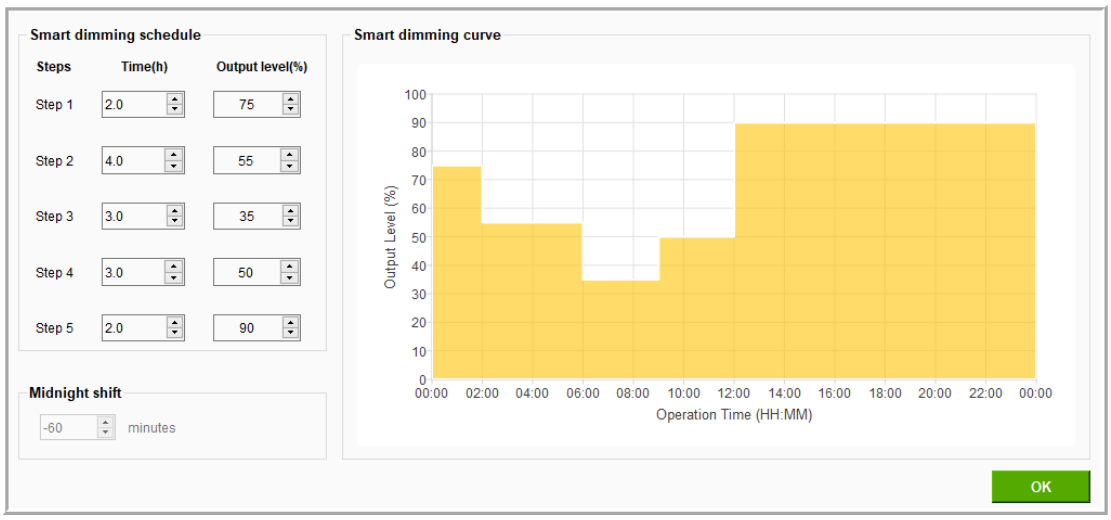
Fixed Timer: It is a memoryless-based dimming mode that tracks the output level based on the programmed timing curve. The output level is organized by scheduled profile in five steps.



Midnight Centric Timer: This mode is a memory-based that automatically measures over the past two days the power-on time of the lighting installation at which is the naturally corresponded to night time. The Midnight Centric Timer software calculates the length of power on time and centralized from the given virtual midnight point and change the output level accordingly.



Ratio Rescale Timer: This mode is similar to Midnight Centric Timer that records the power-on time based on the local night time. The Ratio Rescale Timer software rescale programmed output power profile of each step by a calculated percentage of the recorded power-on time out of given 5 steps duration.



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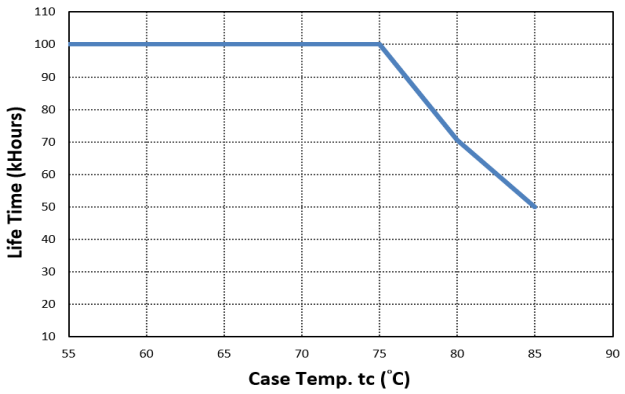
Lifetime VS Case Temperature

EUCI-040105GLA



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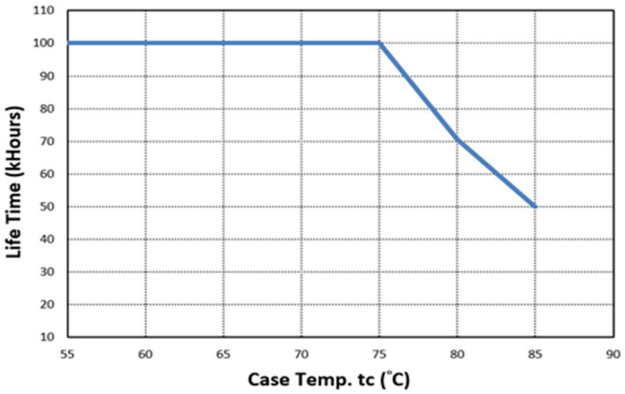

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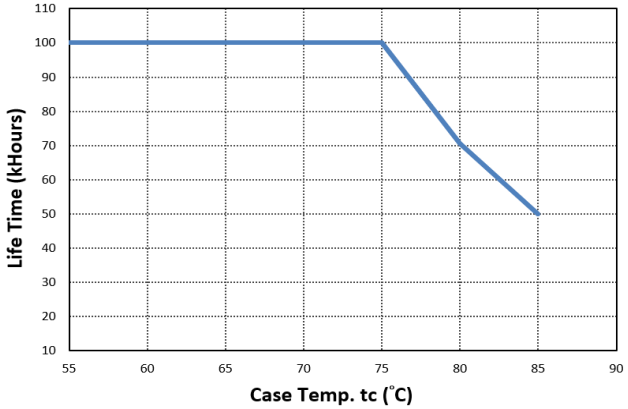

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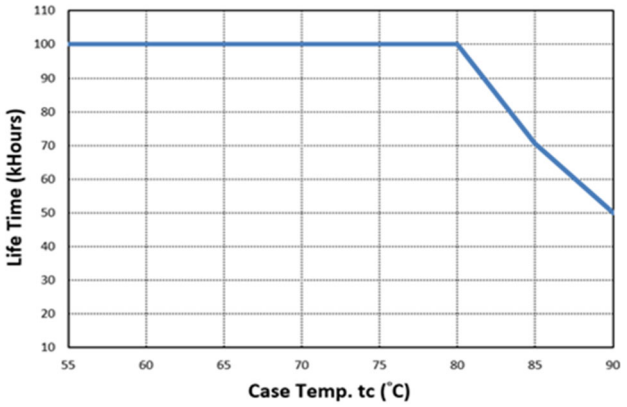

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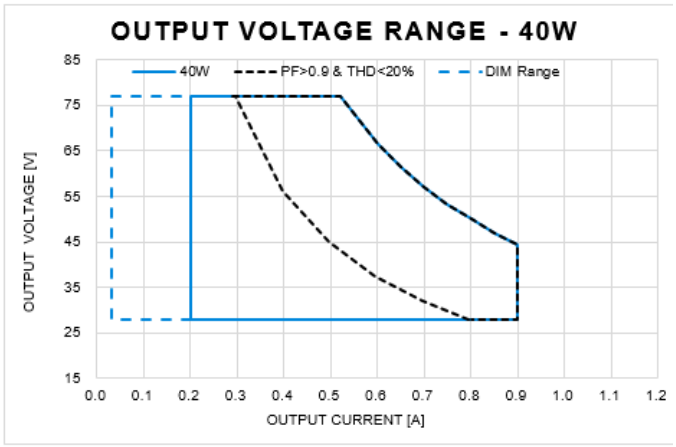
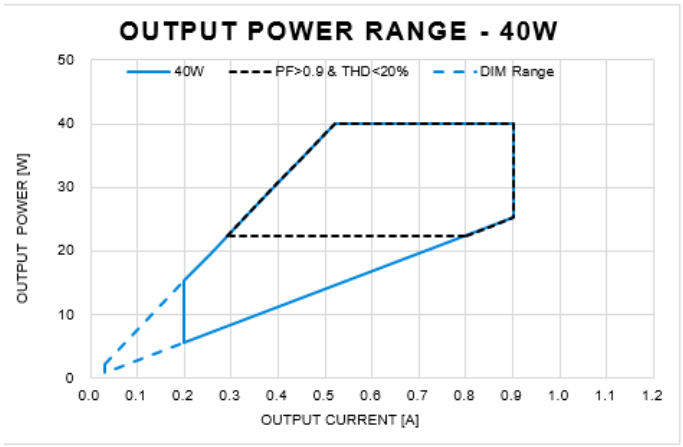
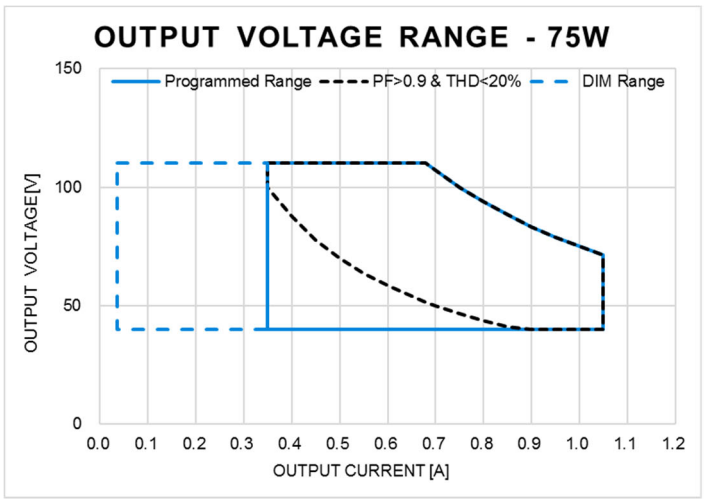
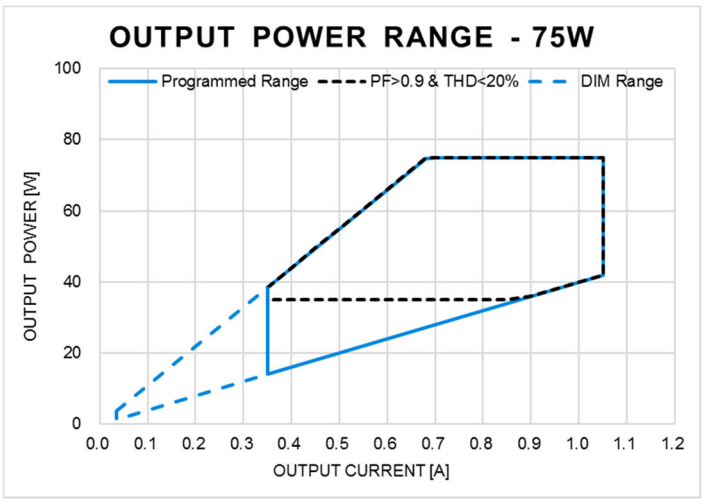
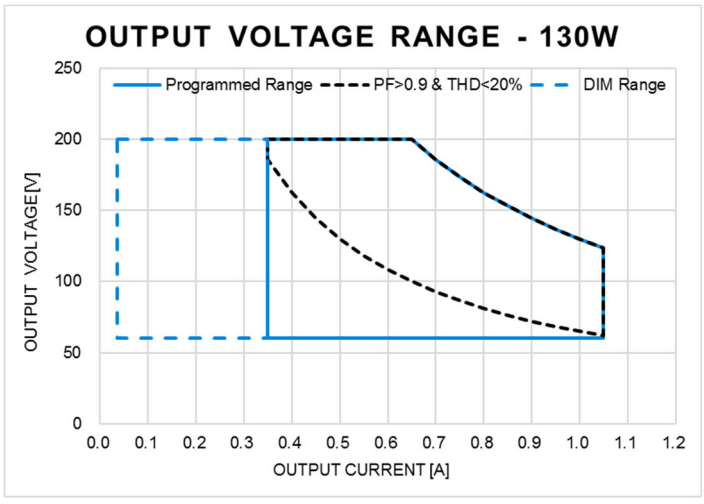
Operation Window

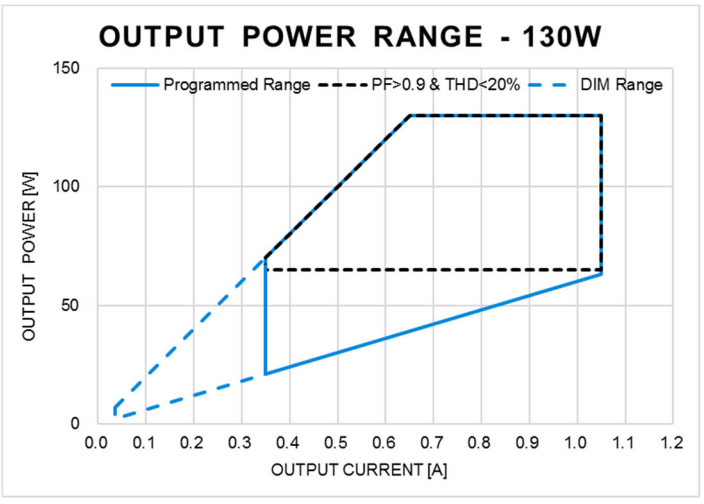












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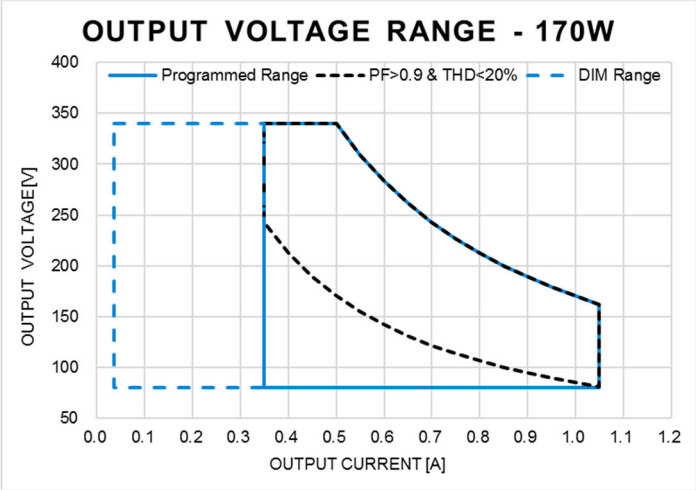
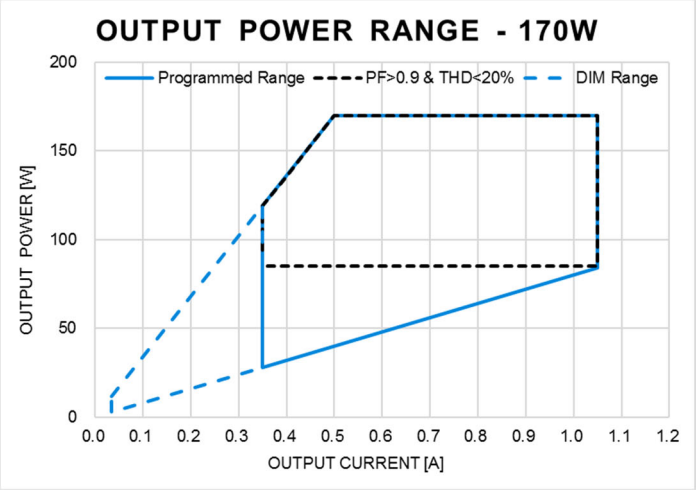
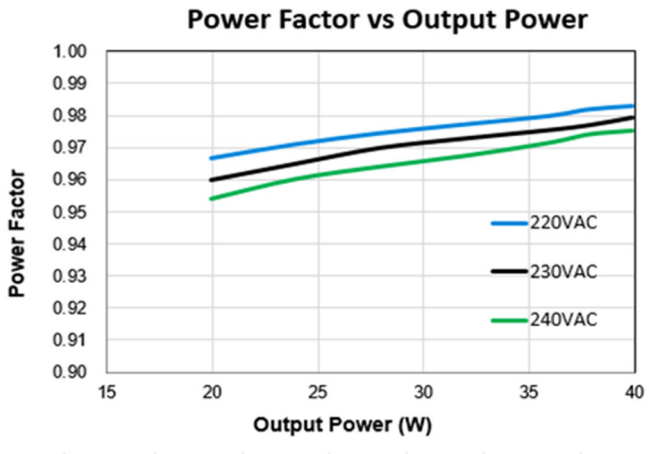




Power Factor VS Output Power

EUCI-040105GLA



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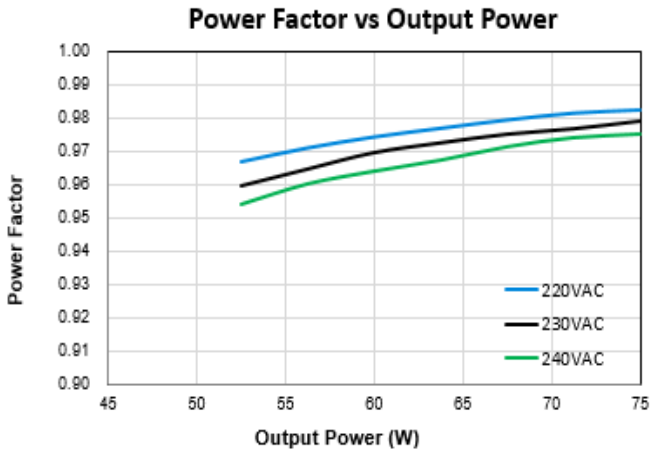

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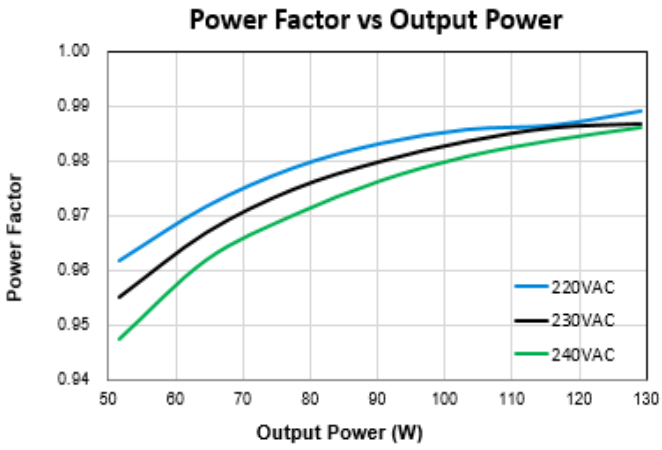

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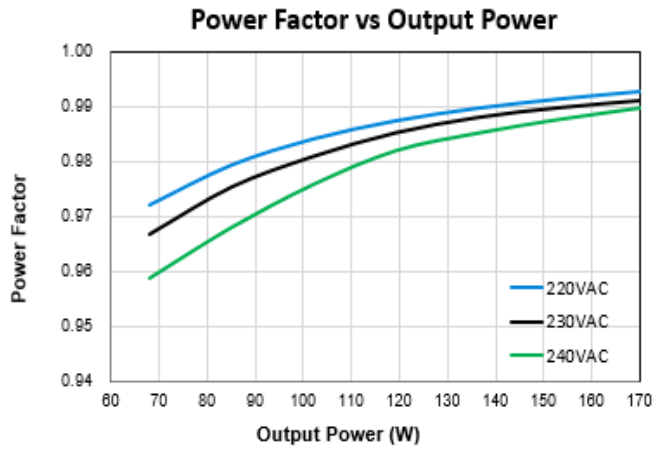
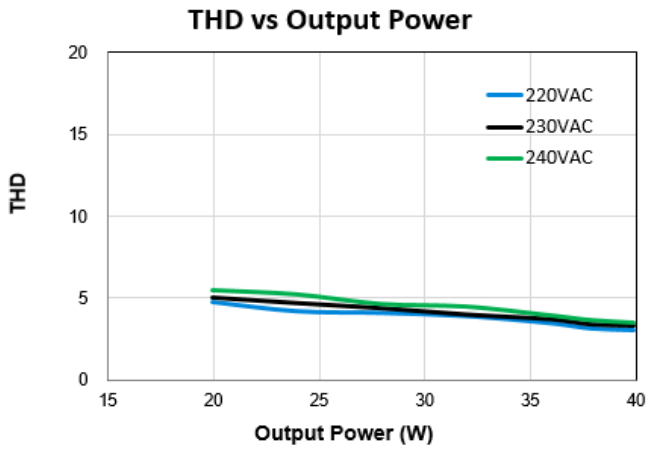


Total Harmonic Distortion VS Output Power

EUCI-040105GLA



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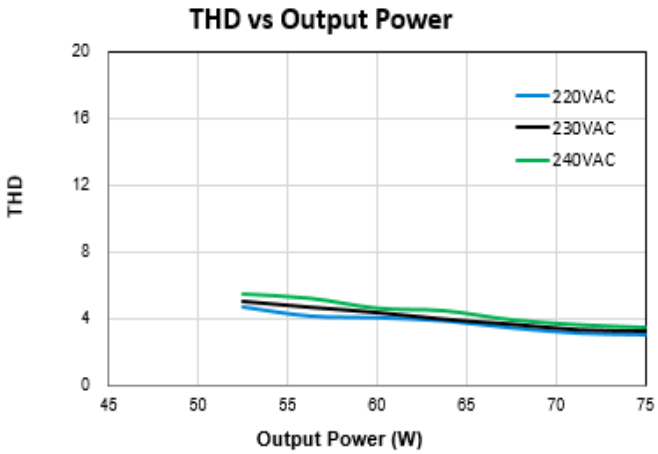

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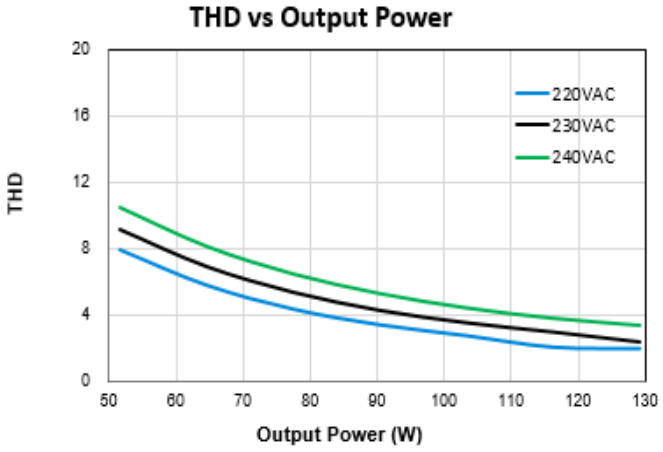

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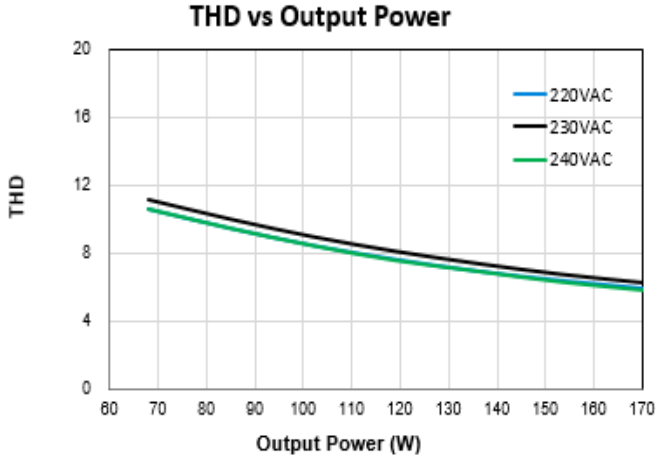
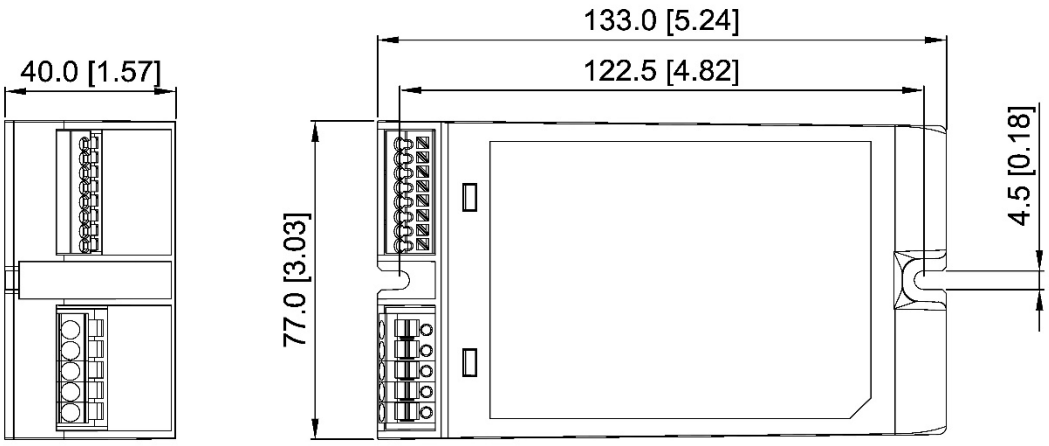


Dimensions

EUCI-040105GLA & EUCI-075105GLA



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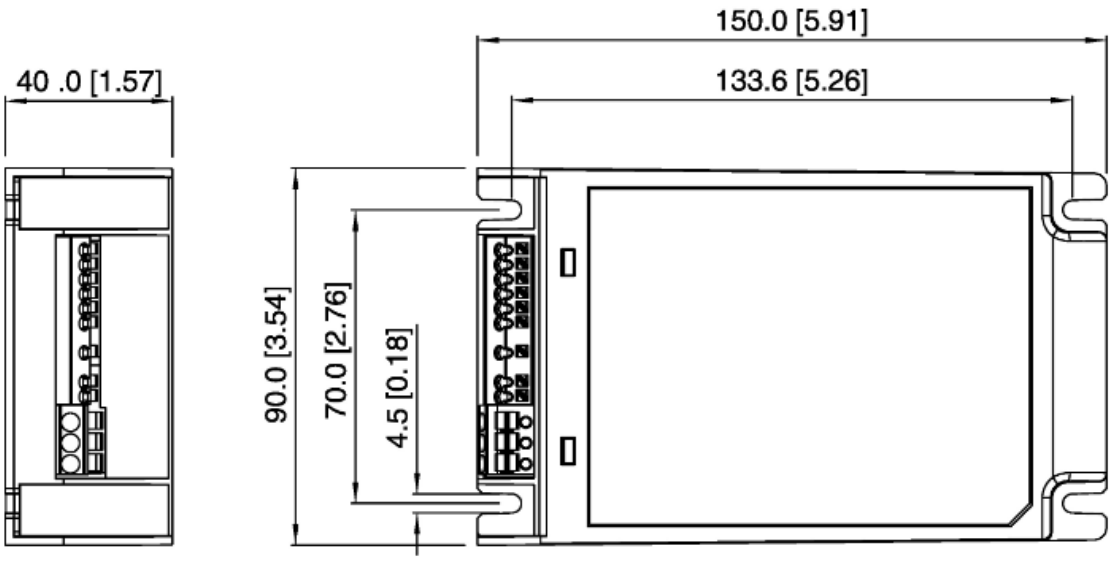
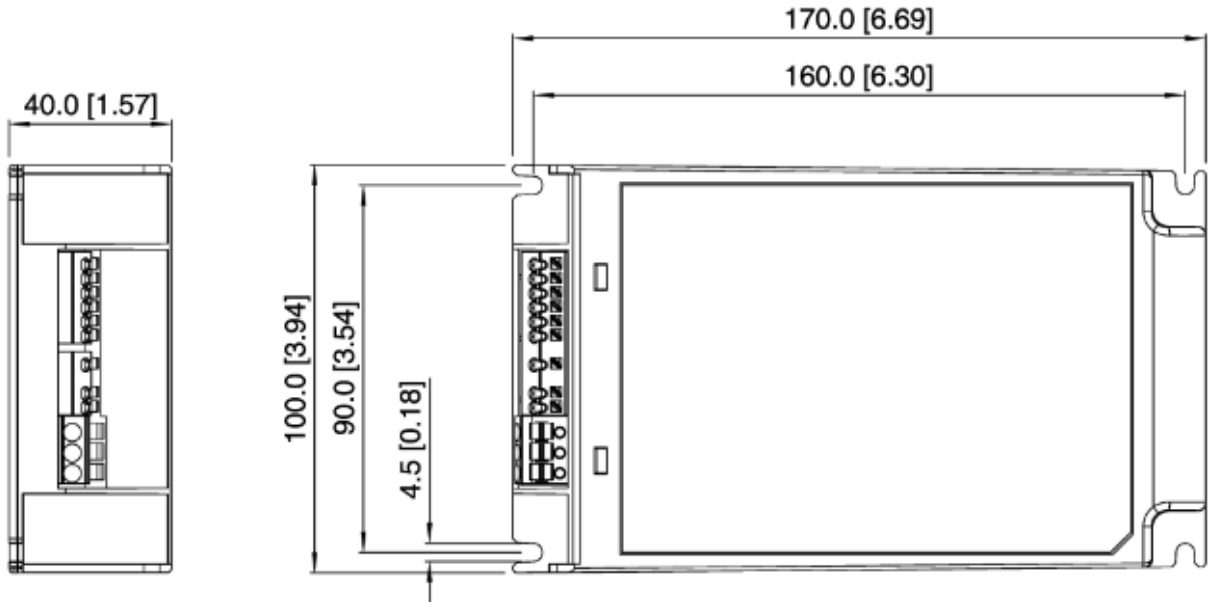


Unit: mm [inch]

Dimensions

EUCI-170105GLA



Unit: mm [inch]

Functions

Start-up Time

The time required for the output voltage to reach 90% of its final steady state set value, after the input voltage is applied.

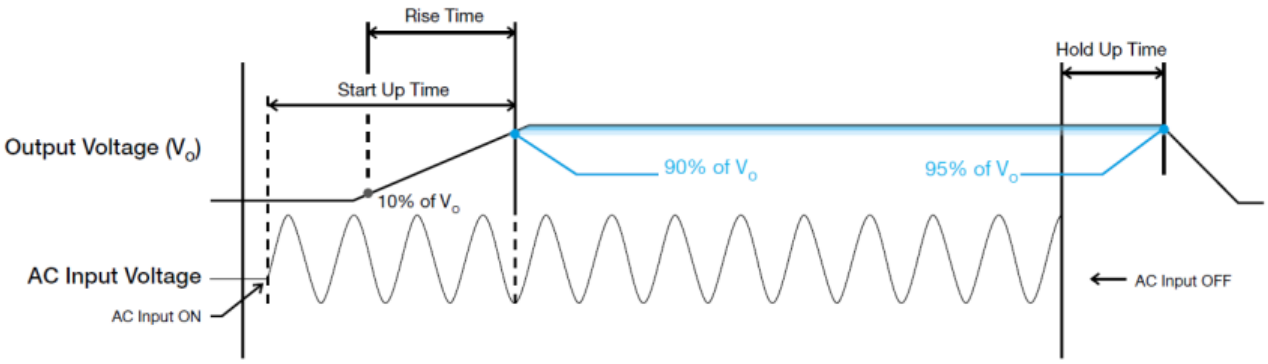
Rise Time

The time required for the output voltage to change from 10% to 90% of its final steady state set value.

Hold-up Time

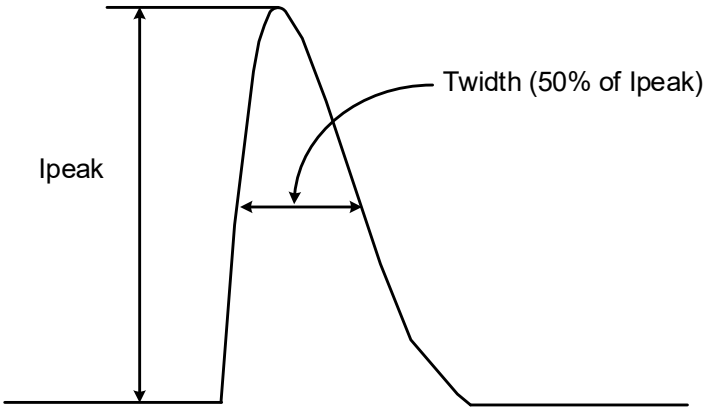
Time between the collapse of the AC input voltage, and the output falling to 95% of its steady state set value.

■ **Graph illustrating the Start-up Time, Rise Time, and Hold-up Time**



Inrush Current

Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



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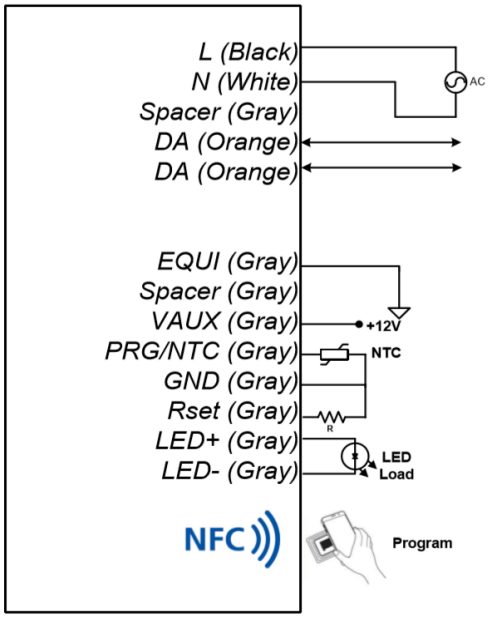
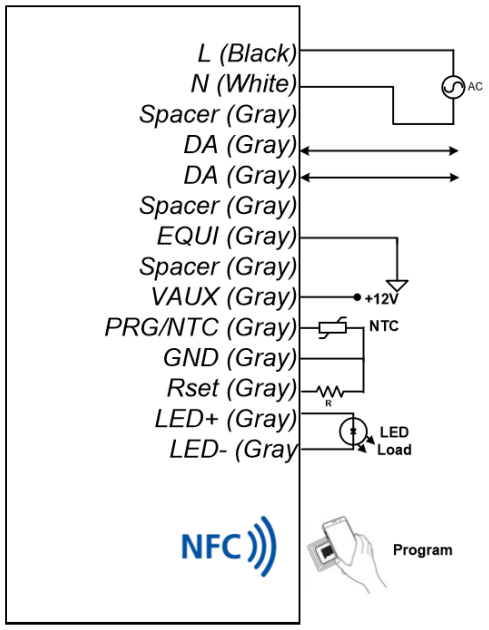
Wired Connection and NFC program

40W & 75W



130W & 170W



Others and Protection

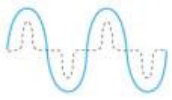
Delta RoHS Compliant

Restriction of the usage of hazardous substances

The European directive 2011/65/EU limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHS is the abbreviation for “Restriction of the use of certain hazardous substances in electrical and electronic equipment”.

This product conforms to this standard.

PFC – Norm EN 61000-3-2



Line Current Harmonic content

Typically, the input current waveform is not sinusoidal due to the periodical peak charging of the input capacitor. In industrial environment, complying with EN 61000-3-2 is only necessary under special conditions. Complying with this standard can have some technical drawbacks, such as lower efficiency as well as some commercial aspects such as higher purchasing costs. Frequently, the user does not profit from fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.

Over Voltage Protections (Auto-Recovery)

The LED driver's Overvoltage Protections (OVP) will be activated when output voltage is achieved trigger point defined at OVP range. Upon such an occurrence, the I_O (output current) will start to droop.

Short Circuit Protection (Auto-Recovery)

The LED driver's output OLP function also provides protection against short circuits. When a short circuit is applied, the LED driver will operate in "hiccup mode". It will return to normal operation after the short circuit is removed.

Overload & Overcurrent Protection (Auto-Recovery)

The LED driver's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output is between 95% and 108% of Io (max load). Upon such an occurrence, the Vo (output voltage) will start to droop. Once the LED driver has reached its maximum power limit, the protection will be activated; and, the LED driver will operate in "CC mode". The LED driver will recover once the fault condition once the cause of OLP or OCP is removed, and Io is back within the specified range.

Over Temperature Protection (Auto-Recovery)

As mentioned above, the LED driver also has Over Temperature Protection (OTP). In the event of a higher operating temperature at 100% load, the LED driver will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into bouncing mode until the temperature drops to its normal operating temperature as recommended in the de-rating graph.

Safety Instructions

- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the device. If mains is not turned OFF, there is risk of explosion / severe damage.
- To guarantee sufficient convection cooling, keep a distance of 50mm above and lateral distance to other units.
- DO NOT insert any objects into the device.
- When the PE terminal is not connected, the device must be installed on a metal plate with PE connection.
- The current rating for the output cable must be rated higher than or equal to the output current of the power supply. Please refer to the product specifications.
- For device with dimming function, always ensure the dimming control is working properly. "Dimming 0-10V" shall be insulated from AC mains by reinforced insulation.

Document Revision Record

Rev	Change Notice	Date
S00	Draft	2020/05/13