

## Features

- Compact Metal Case with Excellent Thermal Performance
- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 1-5V/1-10V/10V PWM/3-Timer-Modes Dimmable
- Output Lumen Compensation
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: OVP, SCP, OTP
- IP66 / IP67 and UL Dry / Damp / Wet Location
- SELV Output
- TYPE HL, for Use in a Class I, Division 2 Hazardous (Classified) Location
- 5 Years Warranty



## Description

The EUM-320SxxxDx series is a 320W, constant-current, programmable and IP66/IP67 LED rated driver that operates from 90-305Vac input with excellent power factor. It is created for many lighting applications including high bay, high mast and roadway, etc. The high efficiency of these drivers and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.

## Models

Adjustable Output Current Range	Full-Power Current Range(1)	Default Output Current	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Typical Power Factor		Model Number (5)
							120Vac	220Vac	
70-1050mA	700-1050mA	700 mA	90~305 Vac/ 127~300 Vdc	153~457 Vdc	320 W	94.0%	0.99	0.96	EUM-320S105Dx
105-1500mA	1050-1500mA	1400 mA	90~305 Vac/ 127~300 Vdc	107~305 Vdc	320 W	94.0%	0.99	0.96	EUM-320S150Dx
175-2500mA	1750-2500mA	2100 mA	90~305 Vac/ 127~300 Vdc	64~183 Vdc	320 W	94.0%	0.99	0.96	EUM-320S250Dx
285-5000mA	2850-5000mA	4900 mA	90~305 Vac/ 127~300 Vdc	32~112 Vdc	320 W	93.0%	0.99	0.96	EUM-320S500Dx <sup>(4)</sup>
535-7600mA	5350-7600mA	6700 mA	90~305 Vac/ 127~300 Vdc	21 ~ 60 Vdc	320 W	93.0%	0.99	0.96	EUM-320S760Dx <sup>(4)</sup>

**Notes:** (1) Output current range with constant power at 320W.

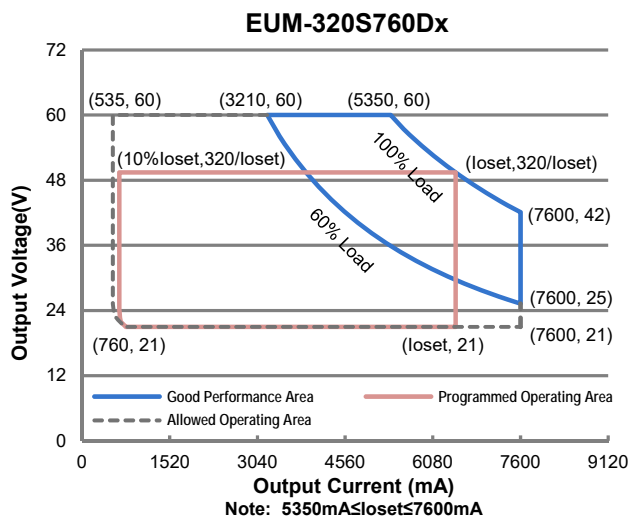
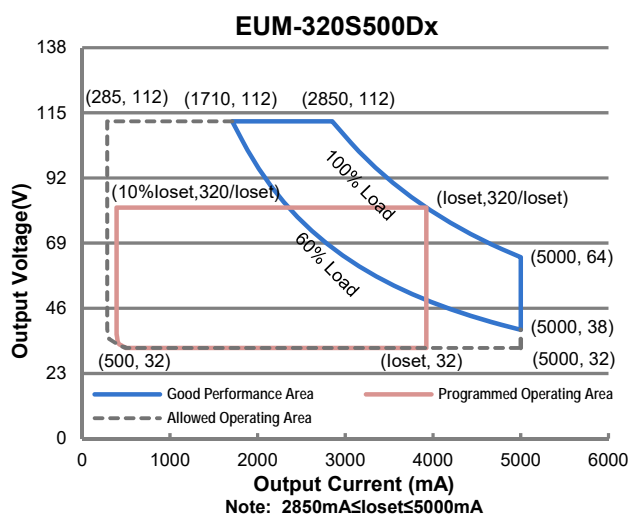
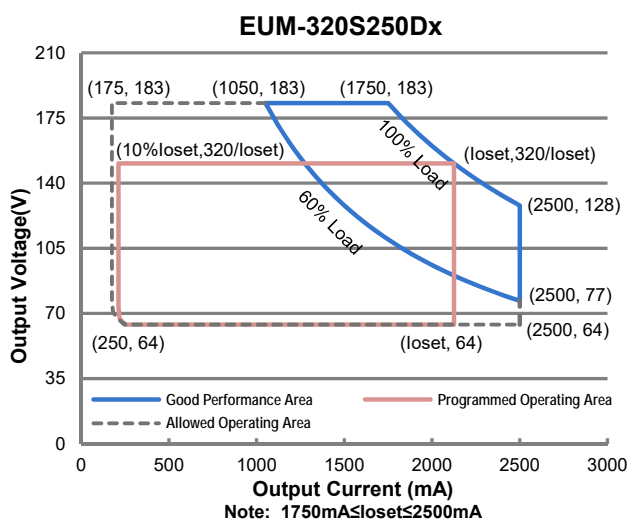
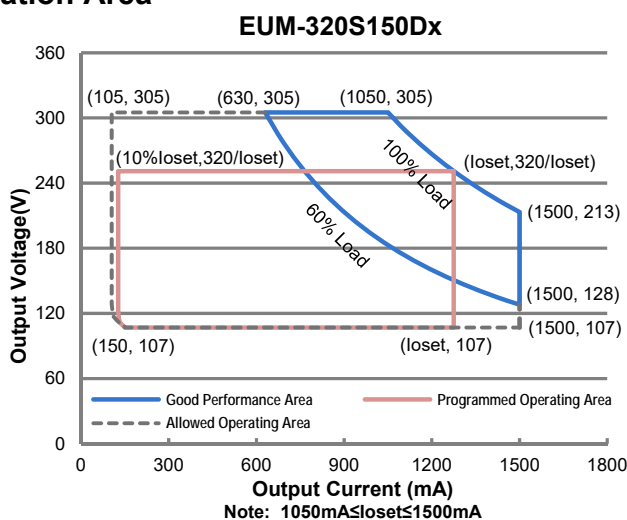
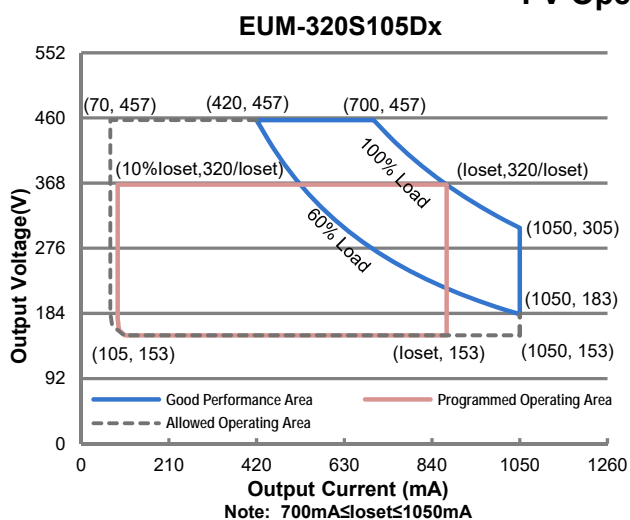
(2) Certified input voltage range: UL, FCC 100-277Vac; otherwise 100-240Vac.

(3) Measured at 100% load and 220Vac input (see below "General Specifications" for details).

(4) SELV output.

(5) x = G are UL Recognized, ENEC and CCC, etc. models; x = T are UL Class P models.

## I-V Operation Area



## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	300 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MU	UL8750; 277Vac/ 60Hz
	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	-	3.29 A	Measured at 100% load and 120 Vac input.
	-	-	1.76 A	Measured at 100% load and 220 Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	1.09 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration=7.84 ms, 10%I <sub>pk</sub> -10%I <sub>pk</sub> . See Inrush Current Waveform for the details.
PF	0.9	-	-	At 100-277Vac, 50-60Hz, 60%-100% Load (192-320W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100% Load (240-320W)

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%loset	-	5%loset	At 100% load condition
Output Current Setting(loset) Range				
EUM-320S105Dx	70 mA	-	1050 mA	
EUM-320S150Dx	105 mA	-	1500 mA	
EUM-320S250Dx	175 mA	-	2500 mA	
EUM-320S500Dx	285 mA	-	5000 mA	
EUM-320S760Dx	535 mA	-	7600 mA	
Output Current Setting Range with Constant Power				
EUM-320S105Dx	700 mA	-	1050 mA	
EUM-320S150Dx	1050 mA	-	1500 mA	
EUM-320S250Dx	1750 mA	-	2500 mA	
EUM-320S500Dx	2850 mA	-	5000 mA	
EUM-320S760Dx	5350 mA	-	7600 mA	
Total Output Current Ripple (pk-pk)	-	5%lomax	10%lomax	At 100% load condition. 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%lomax	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%lomax	At 100% load condition
No Load Output Voltage				
EUM-320S105Dx	-	-	500 V	
EUM-320S150Dx	-	-	340 V	
EUM-320S250Dx	-	-	210 V	
EUM-320S500Dx	-	-	120 V	
EUM-320S760Dx	-	-	70 V	

## Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Line Regulation	-	-	±0.5%	Measured at 100% load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120-277Vac input, 65%-100%load
Temperature Coefficient of Isotet	-	0.03%/°C	-	Case temperature = 0°C ~Tc max

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: EUM-320S105Dx				Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io= 700 mA	89.5%	91.5%	-	
Io=1050 mA	90.0%	92.0%	-	
EUM-320S150Dx				
Io=1050 mA	89.5%	91.5%	-	
Io=1500 mA	89.5%	91.5%	-	
EUM-320S250Dx				
Io=1750 mA	90.0%	92.0%	-	
Io=2500 mA	90.0%	92.0%	-	
EUM-320S500Dx				
Io=2850 mA	89.0%	91.0%	-	
Io=5000 mA	89.0%	91.0%	-	
EUM-320S760Dx				
Io=5350 mA	88.5%	90.5%	-	
Io=7600 mA	88.0%	90.0%	-	
Efficiency at 220 Vac input: EUM-320S105Dx				Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io= 700 mA	91.5%	93.5%	-	
Io=1050 mA	92.0%	94.0%	-	
EUM-320S150Dx				
Io=1050 mA	92.0%	94.0%	-	
Io=1500 mA	92.0%	94.0%	-	
EUM-320S250Dx				
Io=1750 mA	92.0%	94.0%	-	
Io=2500 mA	92.0%	94.0%	-	
EUM-320S500Dx				
Io=2850 mA	91.0%	93.0%	-	
Io=5000 mA	91.0%	93.0%	-	
EUM-320S760Dx				
Io=5350 mA	91.0%	93.0%	-	
Io=7600 mA	90.5%	92.5%	-	

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 277 Vac input: EUM-320S105Dx Io= 700 mA Io=1050 mA EUM-320S150Dx Io=1050 mA Io=1500 mA EUM-320S250Dx Io=1750 mA Io=2500 mA EUM-320S500Dx Io=2850 mA Io=5000 mA EUM-320S760Dx Io=5350 mA Io=7600 mA	92.0% 92.5% 92.0% 92.5% 92.0% 92.5% 91.5% 91.0% 91.0% 91.0%	94.0% 94.5% 94.0% 94.5% 94.0% 94.5% 93.5% 93.0% 93.0% 93.0%	- - - - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
MTBF	-	228,000 Hours	-	Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	111,000 Hours	-	Measured at 220Vac input, 80%load and 70°C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+90°C	
Operating Case Temperature for Warranty Tc_w	-40°C	-	+80°C	Case temperature for 5 years warranty Humidity: 10% RH to 95% RH
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 95%RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	8.82 × 3.15 × 1.75 224 × 80 × 44.5			With mounting ear 9.57 × 3.15 × 1.75 243 × 80 × 44.5
Net Weight	-	1510 g	-	

## Dimming Specifications

Parameter		Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin		-20 V	-	20 V	
Source Current on Vdim (+)Pin		200 μA	300 μA	450 μA	Vdim(+) = 0 V
Dimming Output Range	EUM-320S105Dx EUM-320S150Dx EUM-320S250Dx EUM-320S500Dx EUM-320S760Dx	10%loset	-	loset	700 mA ≤ loiset ≤ 1050 mA 1050 mA ≤ loiset ≤ 1500 mA 1750 mA ≤ loiset ≤ 2500 mA 2850 mA ≤ loiset ≤ 5000 mA 5350 mA ≤ loiset ≤ 7600 mA
	EUM-320S105Dx EUM-320S150Dx EUM-320S250Dx EUM-320S500Dx EUM-320S760Dx	70 mA 105 mA 175 mA 285 mA 535 mA	-	loset	70 mA ≤ loiset < 700 mA 105 mA ≤ loiset < 1050 mA 175 mA ≤ loiset < 1750 mA 285 mA ≤ loiset < 2850 mA 535 mA ≤ loiset < 5350 mA
Recommended Dimming Range for 1-5V		0.25 V	-	4.75 V	Dimming mode set to 1-5V in PC interface.

## Dimming Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Recommended Dimming Range for 1-10V	1 V	-	9 V	Default 1-10V dimming mode with positive logic.
PWM_in High Level	-	10V	-	
PWM_in Low Level	-	0V	-	
PWM_in Frequency Range	200 Hz	-	2 KHz	
PWM_in Duty Cycle	0%	-	100%	

## Safety & EMC Compliance

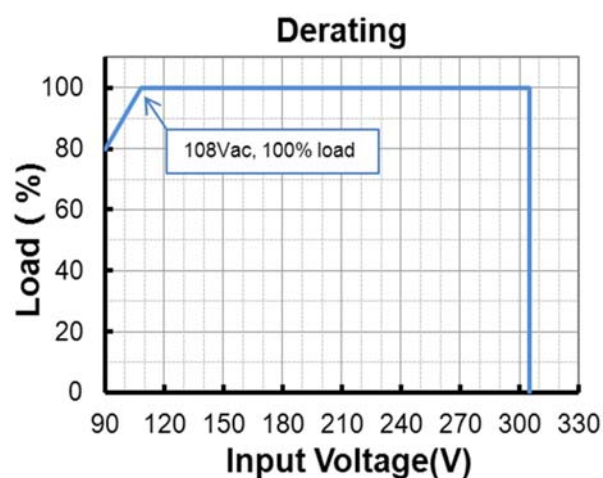
Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13
ENEC & CE	EN 61347-1, EN 61347-2-13
UKCA	BS EN 61347-1, BS EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
PSE	J 61347-1, J 61347-2-13
global-mark	AS/NZS 61347.1, AS/NZS 61347.2.13
EAC	ГОСТ Р МЭК 61347-1, ГОСТ IEC 61347-2-13
NOM	NOM-058-SCFI
EMI Standards	Notes
BS EN/EN 55015/GB 17743/KN 15 <sup>(1)</sup>	Conducted emission Test & Radiated emission Test
BS EN/EN 61000-3-2/GB 17625.1	Harmonic current emissions
BS EN/EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15 <sup>(1)</sup>	ANSI C63.4 Class B This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation.
EMS Standards	Notes
BS EN/EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
BS EN/EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
BS EN/EN 61000-4-4	Electrical Fast Transient / Burst-EFT
BS EN/EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 6 kV, Common Mode 10 kV
BS EN/EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS

## Safety & EMC Compliance (Continued)

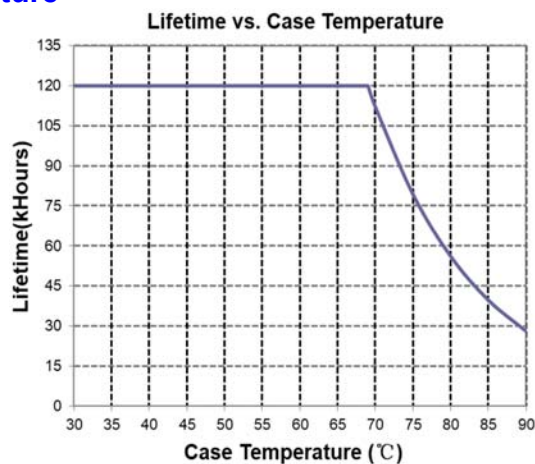
EMS Standards	Notes
BS EN/EN 61000-4-8	Power Frequency Magnetic Field Test
BS EN/EN 61000-4-11	Voltage Dips
BS EN/EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

**Note:** (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

## Derating

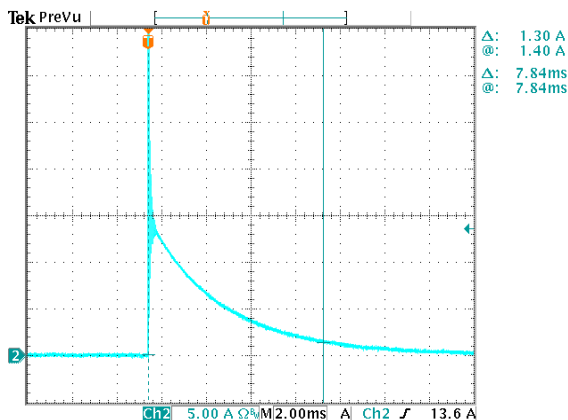


## Lifetime vs. Case Temperature





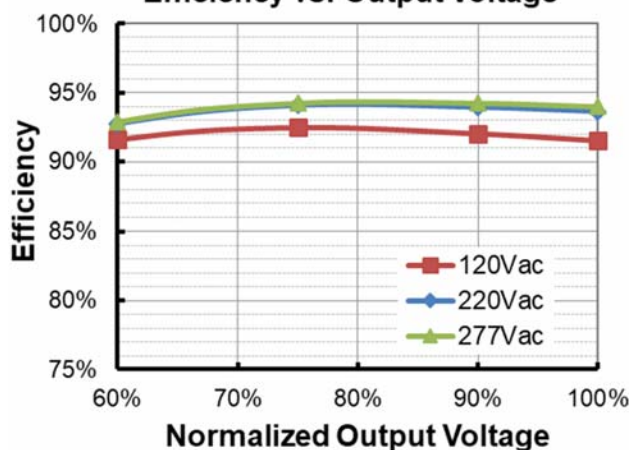
## Inrush Current Waveform



## Efficiency vs. Load

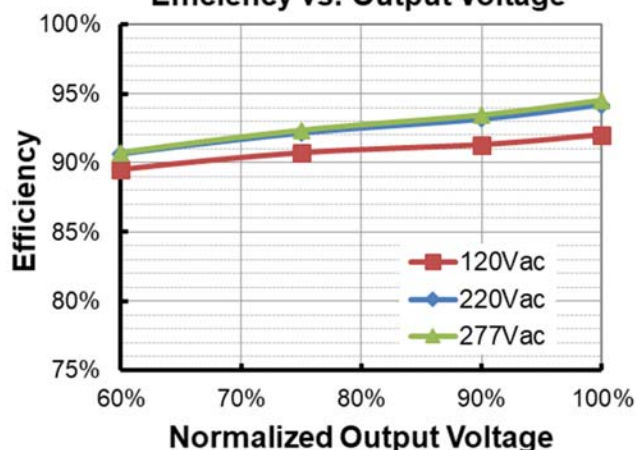
EUM-320S105Dx( $I_o=700mA$ )

Efficiency vs. Output Voltage



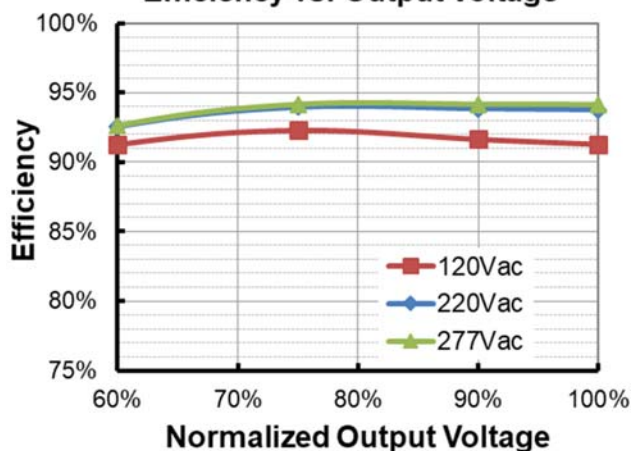
EUM-320S105Dx( $I_o=1050mA$ )

Efficiency vs. Output Voltage



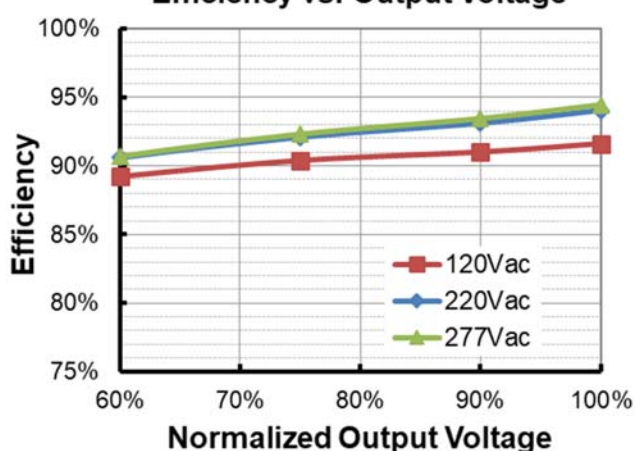
EUM-320S150Dx( $I_o=1050mA$ )

Efficiency vs. Output Voltage

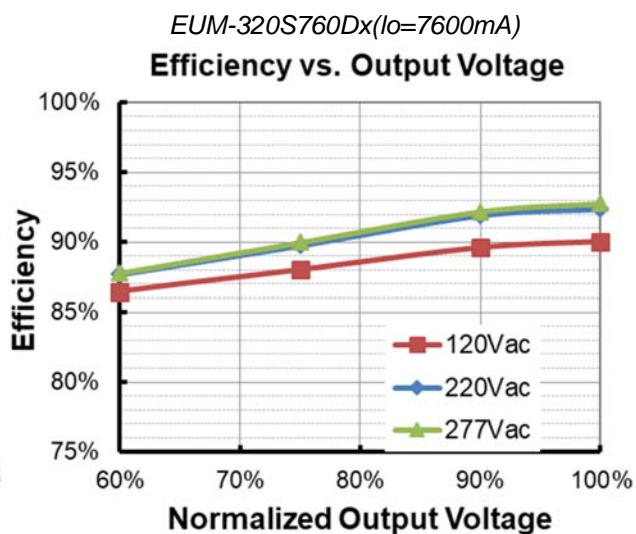
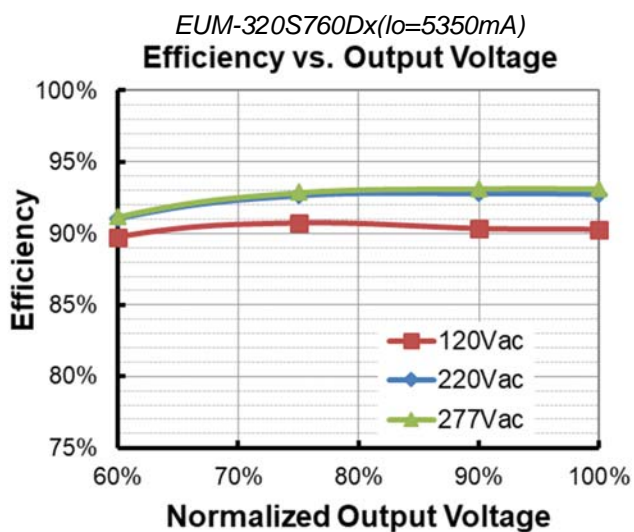
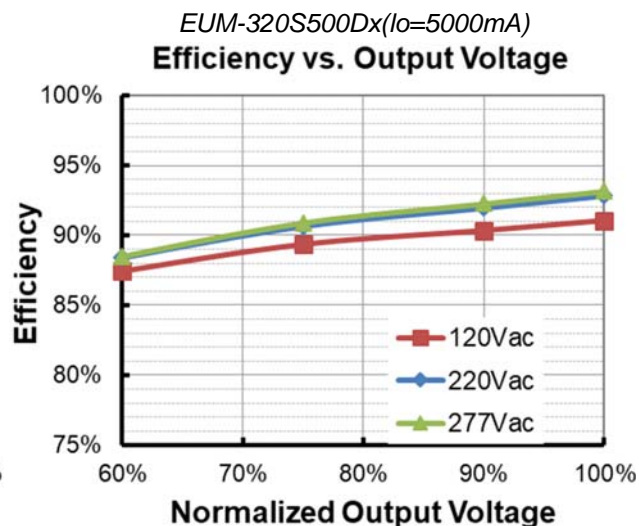
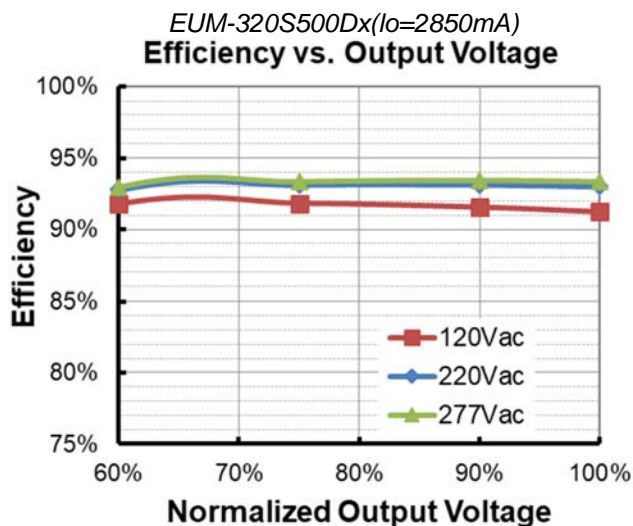
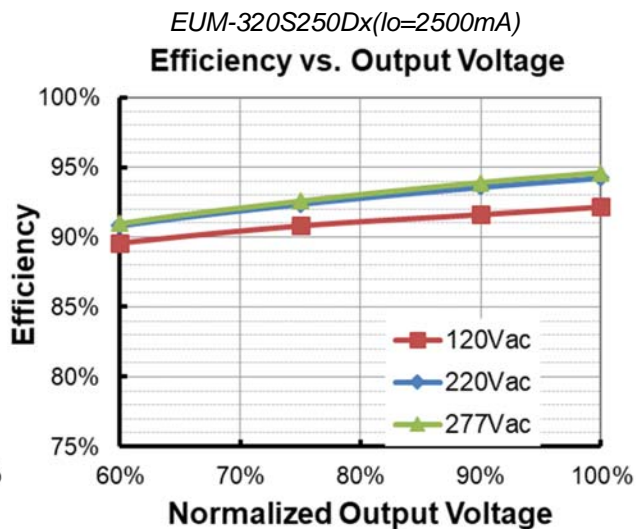
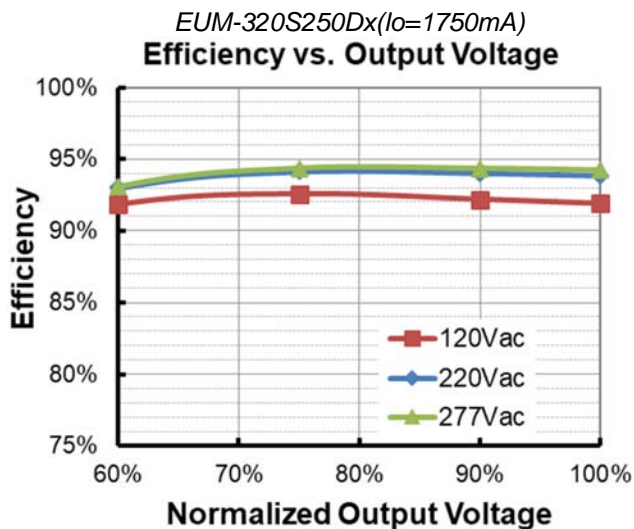


EUM-320S150Dx( $I_o=1500mA$ )

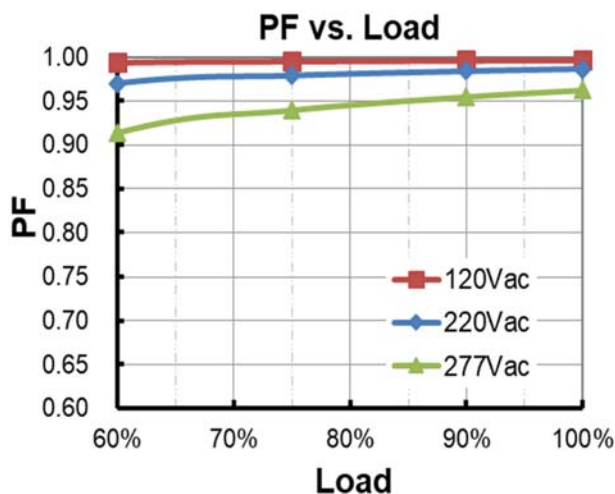
Efficiency vs. Output Voltage



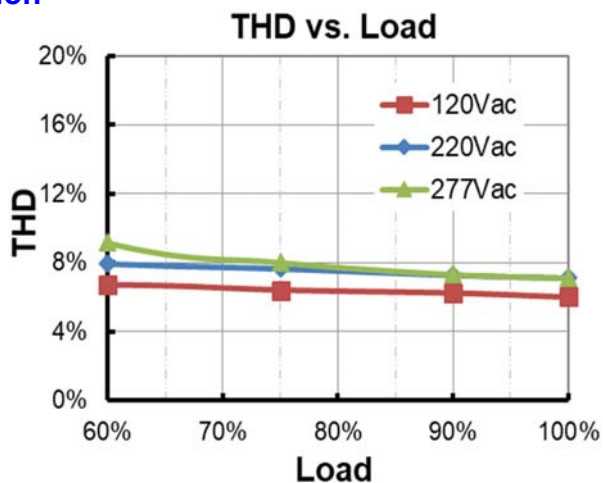




## Power Factor



## Total Harmonic Distortion



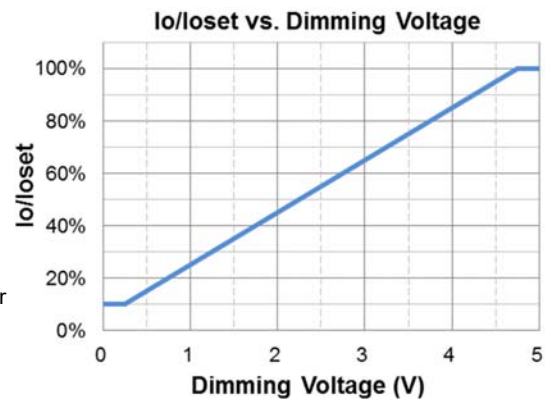
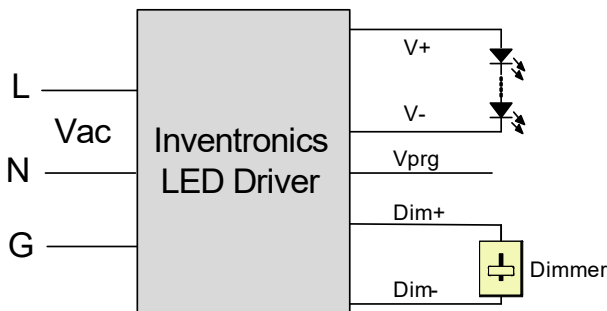
## Protection Functions

Parameter	Notes
Over Temperature Protection	Decreases output current, returning to normal after over temperature is removed.
Short Circuit Protection	Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.
Over Voltage Protection	Limits output voltage at no load and in case the normal voltage limit fails.

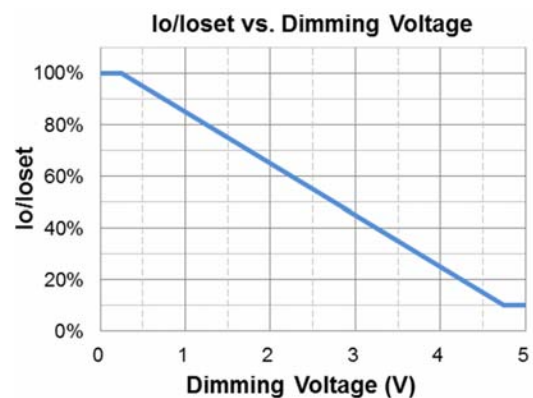
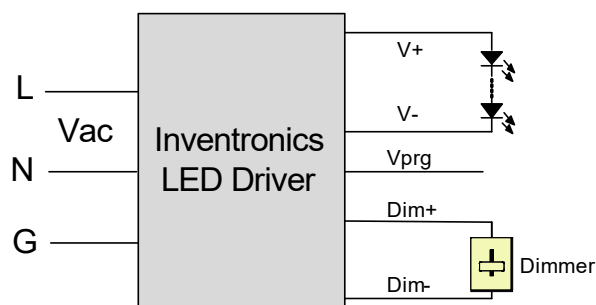
## Dimming

### ● 1-5V Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 1: Positive logic**



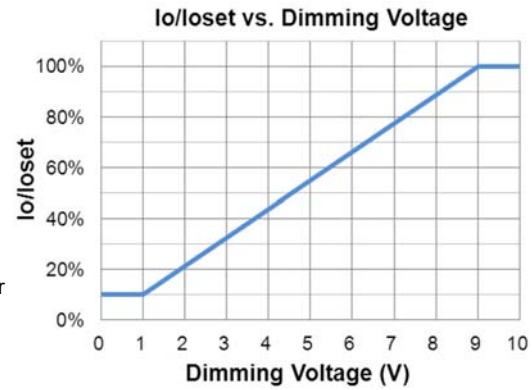
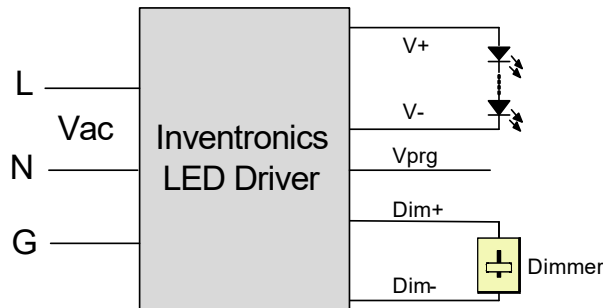
**Implementation 2: Negative logic**

#### Notes:

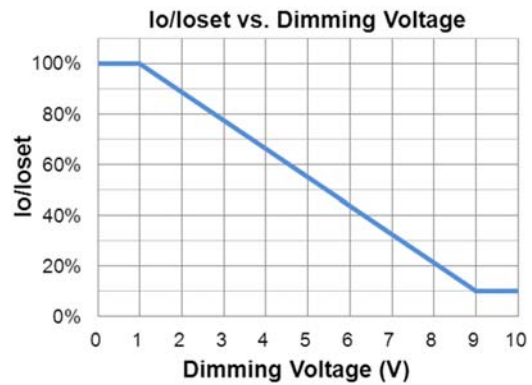
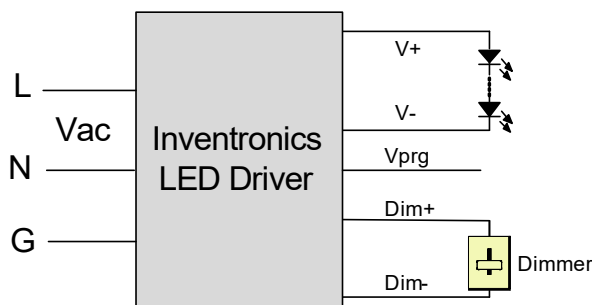
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 1-5V voltage source signal or passive components like zener.
3. When 1-5V negative logic dimming mode and Dim+ is open, the driver will output maximum current.

## ● 1-10V Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 3: Positive logic**



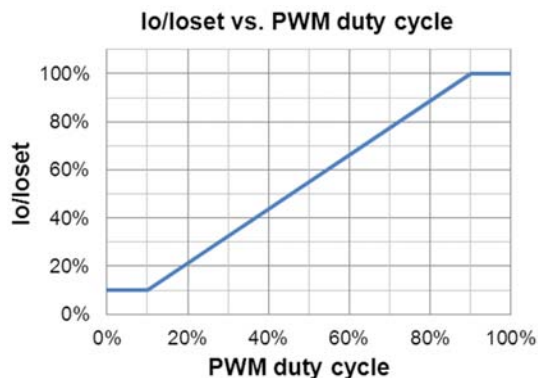
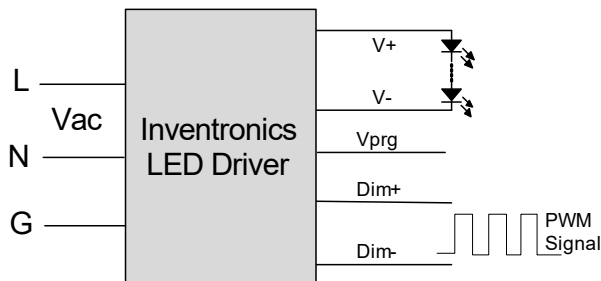
**Implementation 4: Negative logic**

### Notes:

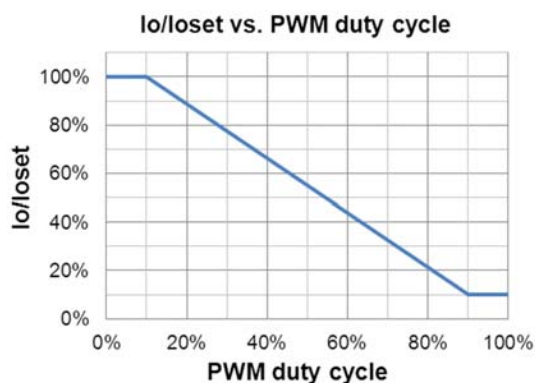
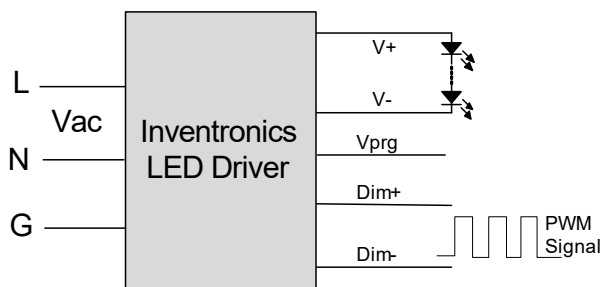
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 1-10V voltage source signal or passive components like zener.
3. When 1-10V negative logic dimming mode and Dim+ is open, the driver will output minimum current.

## ● 10V PWM Dimming

The recommended implementation of the dimming control is provided below.



Implementation 5: Positive logic



Implementation 6: Negative logic

### Notes:

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. When PWM negative logic dimming mode and Dim+ is open, the driver will output minimum current.

## ● Time Dimming

Time dimming control includes 3 kinds of modes, they are Self Adapting-Midnight, Self Adapting-Percentage and Traditional Timer.

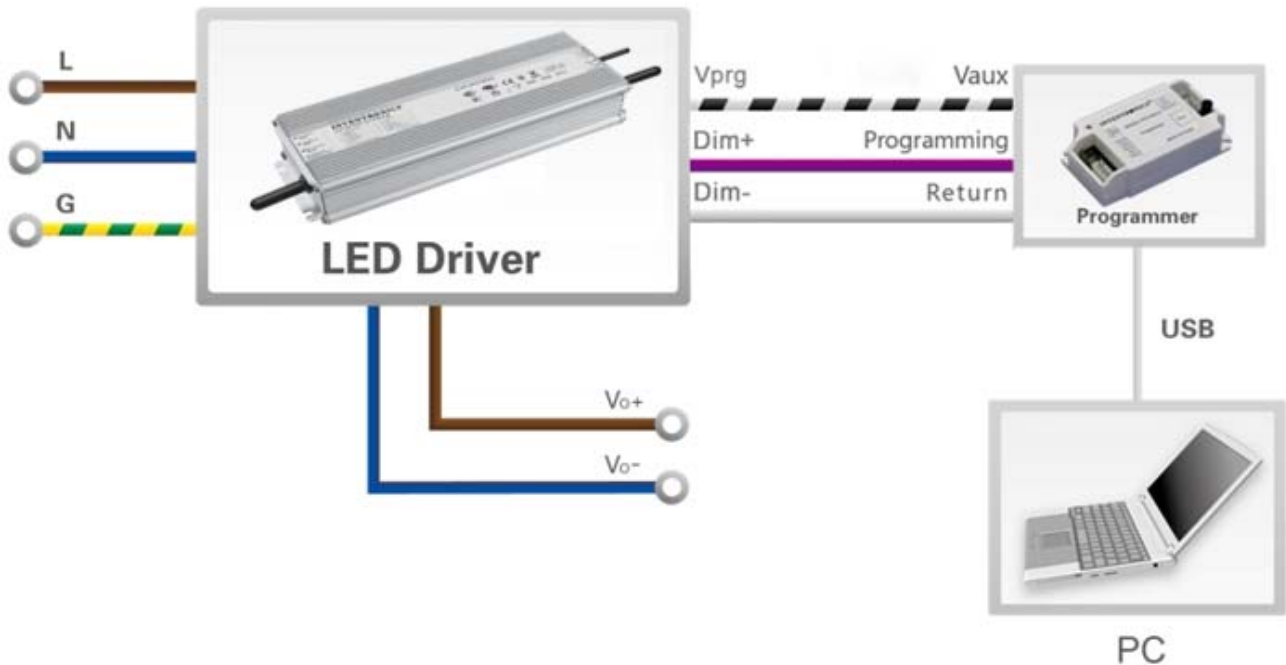
- **Self Adapting-Midnight:** Automatically adjusts the dimming curve based on the on-time of past two days (if difference <15 minutes), assuming that the center point of the dimming curve is midnight local time.
- **Self Adapting-Percentage:** Automatically adjusts the on-time of each step by a constant percentage = (actual on-time for the past 2 days if difference <15 min) / (programmed on-time from the dimming curve).
- **Traditional Timer:** Follows the programmed timing curve after power on with no changes.

## ● Output Lumen Compensation

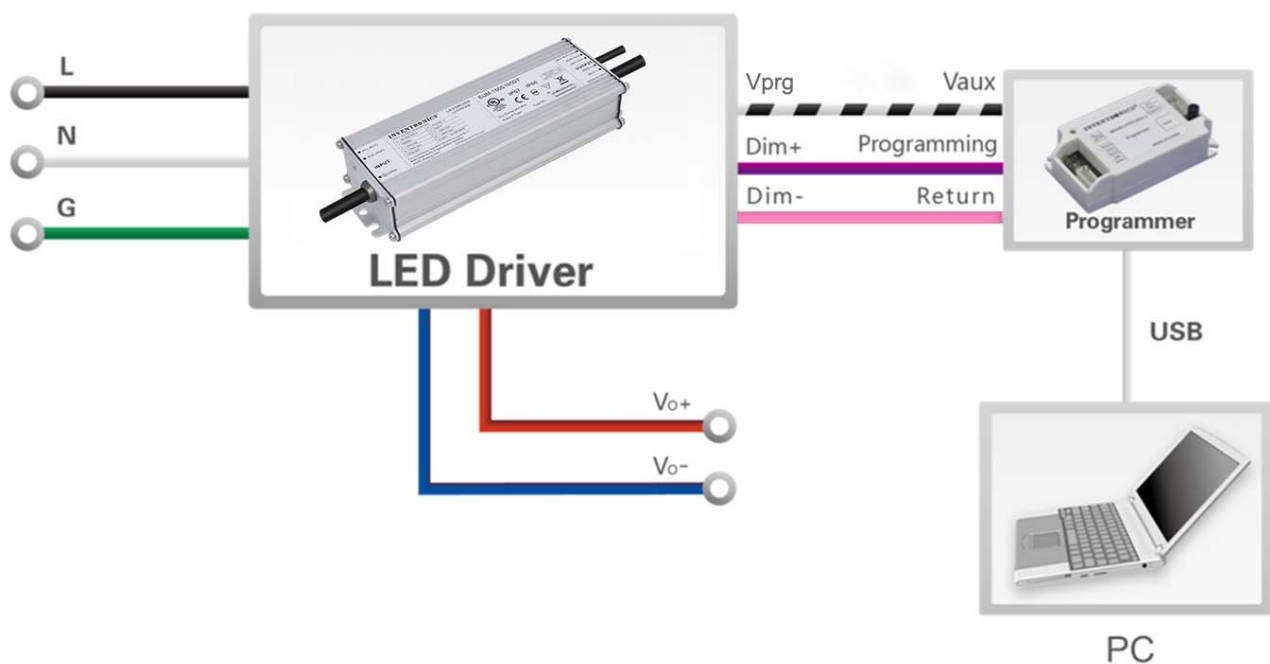
Output Lumen Compensation (OLC) may be used to maintain constant light output over the life of the LEDs by driving them at a reduced current when new, then gradually increasing the drive current over time to counteract LED lumen degradation.

## Programming Connection Diagram

EUM-320SxxxDG



EUM-320SxxxDT



**Note:** The driver does not need to be powered on during the programming process.

- Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.

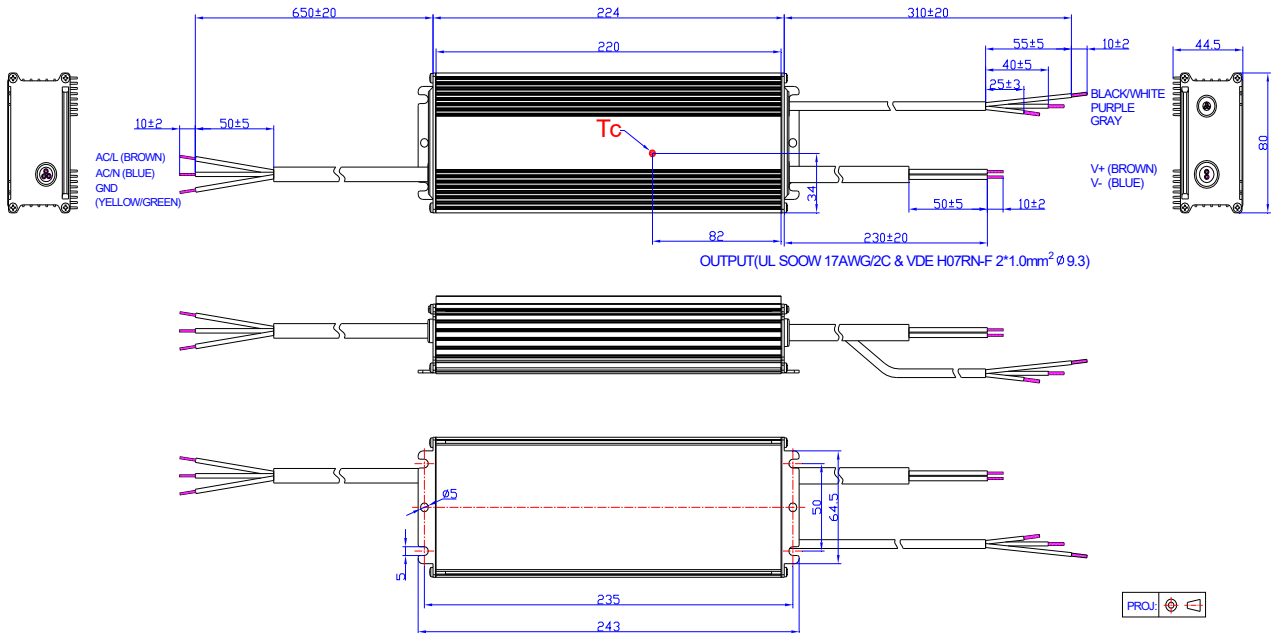


## Mechanical Outline

*EUM-320S105/150DG*

INPUT(UL SJOW 17AWG/3C & VDE H05RN-F 3\*1.0mm<sup>2</sup> Ø 8.3)

Dimming Wire(UL2196 22AWG/3C Ø 5.0)

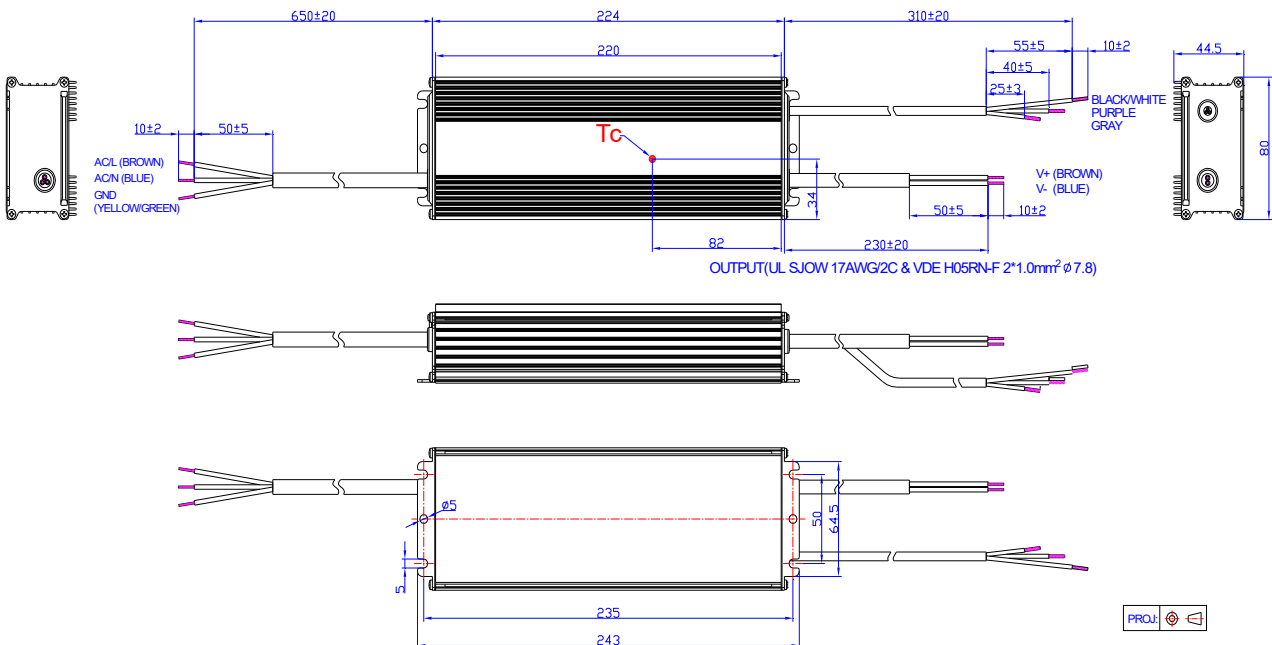


Unspecified tolerance:  $\pm 1$

*EUM-320S250/500/760DG*

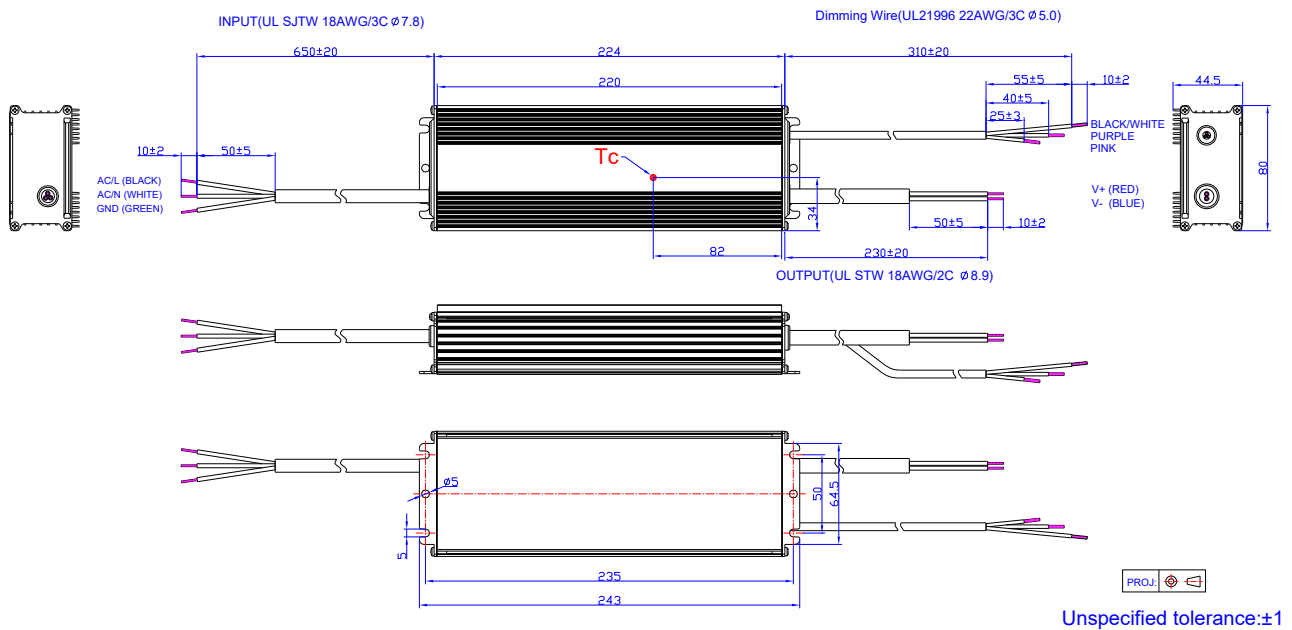
INPUT(UL SJOW 17AWG/3C & VDE H05RN-F 3\*1.0mm<sup>2</sup> Ø 8.3)

Dimming Wire(UL21996 22AWG/3C Ø 5.0)

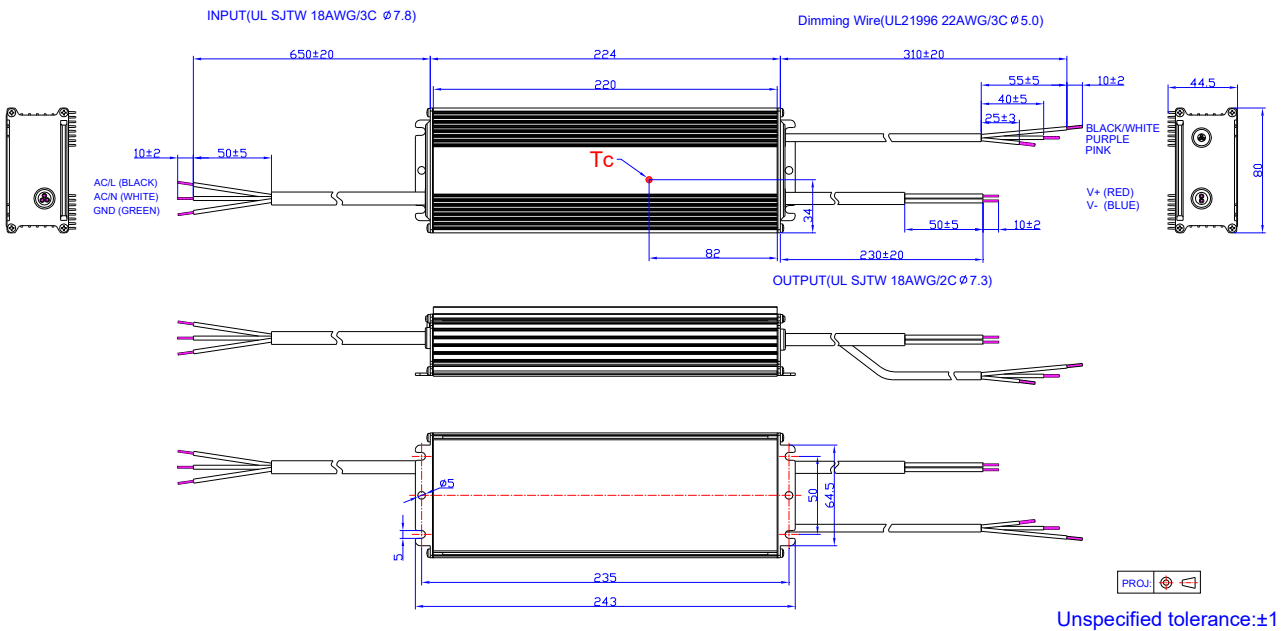


Unspecified tolerance:  $\pm 1$

## EUM-320S105/150DT



## EUM-320S 250/500/760DT



## RoHS Compliance

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

## Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2021-08-19	A	Datasheet Release	/	/
2021-08-26	B	KS logo	/	Deleted
		Programming Connection Diagram	/	Updated
		Safety & EMC Compliance	/	Deleted
2022-02-10	C	UKCA/global-mark logo	/	Added
		Safety & EMC Compliance	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	/	Updated