EUM-050SxxxDx

Rev. B

50W Programmable IP66/IP67 Driver

Features

- 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 4kV, CM 6kV
- All-Around Protection: OVP, SCP, OTP
- IP66 / IP67 and UL Dry / Damp / Wet Location
 Only IP66 and UL Dry / Damp Location (DF models)
- Class 2 & SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location
- Suitable for Luminaires with Protection Class I
- 5 Years Warranty



Description

The EUM-050SxxxDx series is a 50W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 90-305Vac input with excellent power factor. It is created for many lighting applications including low bay, tunnel and street, 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	Full-Power Current	Default Output	Input Voltage	Output Voltage	Max.	Typical Efficiency	Power	oical r Factor	Model Number
Current Range	Range (1)	Current	Range(2)	Range	Power	(3)	120Vac	220Vac	(4)
30-530mA	300-530mA	530 mA	90~305Vac/ 127~300 Vdc	47~167 Vdc	50W	90.5%	0.99	0.96	EUM-050S053Dx ⁽⁵⁾
55-900mA	550-900mA	700 mA	90~305 Vac/ 127~300 Vdc	28~91 Vdc	50W	89.0%	0.99	0.96	EUM-050S090Dx ⁽⁶⁾
92-1500mA	920-1500mA	1050 mA	90~305 Vac/ 127~300 Vdc	17~54 Vdc	50W	88.0%	0.99	0.96	EUM-050S150Dx ⁽⁷⁾

Notes: (1) Output current range with constant power at 50W

(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) x = G are UL Recognized, ENEC and CCC, etc. models; x = T are UL Class P models; x = B are BIS models; x = F are UL Class P models with flying leads. See drawings for cable information.
- (5) Only available with x = G, and only with ENEC, CE, CB and CCC certificates.

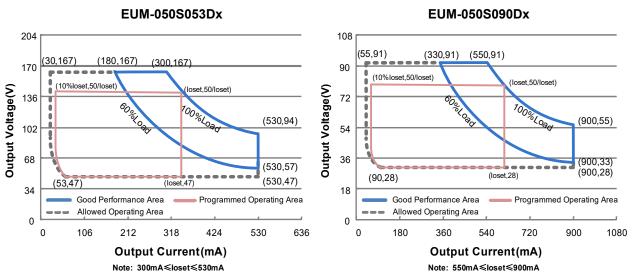
(6) SELV output.

(7) Class 2 & SELV output.

All specifications are typical at 25 $\ensuremath{^{\circ}\!\!C}$ unless otherwise stated.

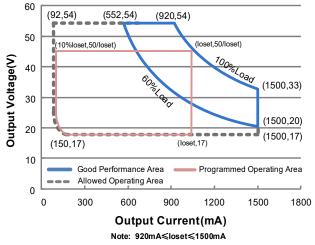


Rev. B



I-V Operation Area

EUM-050S150Dx



Input Specifications

Parameter	Min.	Тур.	Max.	Notes
Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	300 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Lookogo Current	-	-	0.75 MIU	UL8750; 277Vac/ 60Hz
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	- 0.55 A		Measured at 100% load and 120 Vac input.
Input AC Current	-	-	0.30 A	Measured at 100% load and 220 Vac input.

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Specifications are subject to changes without notice.

EUM-050SxxxDx

Rev. B

Input Specifications (Continued)

Parameter	Min.	Тур.	Max.	Notes	
Inrush Current(I ² t)	-	-	0.48 A²s	At 220Vac input, 25°C cold start, duration=292 μs, 10%lpk-10%lpk. See Inrush Current Waveform for the details.	
PF	0.9	-	-	At 100-277Vac, 50-60Hz, 60%-100% Lo (30-50W)	
THD	-	-	20%		
THD	-	-	10%	At 220-240Vac, 50-60Hz, 60%-100% Load (30-50W)	

Output Specifications

Parameter	Min.	Тур.	Max.	Notes
Output Current Tolerance	-5%loset	-	5%loset	At 100% load condition
Output Current Setting(loset) Range				
EUM-050S053Dx EUM-050S090Dx EUM-050S150Dx	30 mA 55 mA 92 mA	- -	530 mA 900 mA 1500 mA	
Output Current Setting Range with Constant Power				
EUM-050S053Dx EUM-050S090Dx EUM-050S150Dx	300 mA 550 mA 920 mA	- -	530 mA 900 mA 1500 mA	
Total Output Current Ripple (pk-pk)	-	5%lomax	10%Iomax	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-050S053Dx EUM-050S090Dx EUM-050S150Dx	- -	-	200 V 120 V 60 V	
Line Regulation	-	-	±1%	Measured at 100% load
Load Regulation	-	-	±5%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120-277Vac input, 60%-100% Load
Temperature Coefficient of loset	-	0.06%/°C	-	Case temperature = 0°C ~Tc max

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EUM-050SxxxDx

Rev. B

General Specifications

EUM-050S090Dx Io= 550 mA 84.0% 86.0% - temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) EUM-050S150Dx Io= 920 mA 83.0% 85.0% - measured immediately after startup.) EUM-050S150Dx Io= 920 mA 83.0% 85.0% - measured immediately after startup.) Efficiency at 220 Vac input: Io= 300 mA 87.5% 89.5% - EUM-050S0503Dx Io= 300 mA 87.5% 89.5% - Measured at 100% load and steady-stemperature in 25°C ambient; EUM-050S0500Dx Io= 500 mA 86.5% 88.5% - Measured at 100% load and steady-stemperature in 25°C ambient; EUM-050S050Dx Io= 900 mA 87.0% - measured immediately after startup.) EUM-050S050Dx Io= 900 mA 88.0% - Measured at 100% load and steady-stemperature in 25°C ambient; EUM-050S050Dx Io= 300 mA 88.0% - Measured at 100% load and steady-stemperature in 25°C ambient; EUM-050S050Dx <td< th=""><th colspan="2">Parameter</th><th>Min.</th><th>Тур.</th><th>Max.</th><th colspan="2">Notes</th></td<>	Parameter		Min.	Тур.	Max.	Notes	
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Io= 530 mA 88.5% 90.5% - Measured at 100% load and steady-stemperature in 25°C ambient; Io= 550 mA 86.5% 88.5% - (Efficiency will be about 2.0% lower if measured immediately after startup.) EUM-050S150Dx Io= 920 mA 85.0% 87.0% - measured immediately after startup.) EUM-050S150Dx Io= 920 mA 85.0% 87.0% - - EUM-050S05050x Io= 90.0% - - - - Efficiency at 277 Vac input: Io= 300 mA 88.0% 90.0% - - EUM-050S0503Dx Io= 300 mA 88.0% 90.0% - Measured at 100% load and steady-stemperature in 25°C ambient; EUM-050S090Dx Io= 550 mA 87.0% 89.0% - (Efficiency will be about 2.0% lower if measured immediately after startup.) EUM-050S150Dx Io= 900 mA 87.5% 89.5% - measured immediately after startup.) EUM-050S150Dx Io= 920 mA 86.0% 88.0% -<		ac input:					
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Io= 900 mA 87.5% 89.5% - measured immediately after startup.) EUM-050S150Dx Io= 920 mA 86.0% 88.0% - - Io= 1500 mA 86.0% 88.0% - - Measured at 220Vac input, 80%Load MTBF - 548,000 - 25°C ambient temperature (MIL-HDB 217F)	UM-050S090Dx						
EUM-050S150Dx Io= 920 mA 86.0% 88.0% - Io=1500 mA 86.0% 88.0% - - MTBF - 548,000 Hours - Measured at 220Vac input, 80%Load 25°C ambient temperature (MIL-HDB 217F)					-	(Efficiency will be about 2.0% lower if	
Io= 920 mA 86.0% 88.0% - Io=1500 mA 86.0% 88.0% - - MTBF - 548,000 Hours - Measured at 220Vac input, 80%Load 25°C ambient temperature (MIL-HDB 217F)		lo= 900 mA	87.5%	89.5%	-	measured immediately after startup.)	
Io=1500 mA 86.0% 88.0% - MTBF - 548,000 Hours - Measured at 220Vac input, 80%Load 25°C ambient temperature (MIL-HDB 217F)	UM-050S150Dx						
MTBF - 548,000 Hours - 25°C ambient temperature (MIL-HDB 217F)					-		
MTBF - 346,000 Hours - 25°C ambient temperature (MIL-HDB 217F)		lo=1500 mA	86.0%	88.0%	-		
Measured at 2201/ac input, 80%Load	MTBF		-	,	-	25°C ambient temperature (MIL-HDBK-	
	Lifetime		-	103,000 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	for Safety Tc_s		-40°C	-	+90°C		
Operating Case Temperature for Warranty Tc_w-40°C-+80°CCase temperature for 5 years warrant Humidity: 10% RH to 95% RH;	Operating Case Temperature		-40°C	-	+80°C	Case temperature for 5 years warrant Humidity: 10% RH to 95% RH;	
Storage Temperature -40°C - +85°C Humidity: 5%RH to 95%RH	Storage Temperature		-40°C	-	+85°C		
Dimensions With mounting ear				•	-	With mounting ear	
Inches (L × W × H) 3.75 × 2.52 × 1.44 4.41 × 2.52 × 1.44			3.75 × 2.52 × 1.44				
Millimeters (L × W × H) 95 × 64 × 36.5 112 × 64 × 36.5	Millimeters	s (L × W × H)		95 × 64 × 36.5		112 × 64 × 36.5	
Net Weight - 490 g -	et Weight		-	490 g	-		

Dimming Specifications

Parameter	Min.	Тур.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin	-20 V	-	20 V	
Source Current on Vdim (+)Pin	200 uA	300 uA	450 uA	Vdim(+) = 0 V

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Dimming Specifications (Continued)

Parameter		Min.	Тур.	Max.	Notes
EUM-050S053Dx EUM-050S090Dx EUM-050S150Dx		10%loset	-	loset	300 mA ≤ loset ≤ 530 mA 550 mA ≤ loset ≤ 900 mA 920 mA ≤ loset ≤ 1500 mA
Output Range	EUM-050S053Dx EUM-050S090Dx EUM-050S150Dx	30 mA 55 mA 92 mA	-	loset	30 mA ≤ loset < 300 mA 55 mA ≤ loset < 550 mA 92 mA ≤ loset < 920 mA
Recommended Dimming Range for 1-5V		0.25 V	-	4.75 V	Dimming mode set to 1-5V in PC interface.
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 Du	ty 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
СВ	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
PSE	J 61347-1, J 61347-2-13
KS	KS C 7655
BIS	IS 15885(Part2/Sec13)
EAC	ГОСТ Р МЭК 61347-1, ГОСТ ІЕС 61347-2-13
EMI Standards	Notes
EN 55015/GB 17743/KN 15 ⁽¹⁾	Conducted emission Test &Radiated emission Test
EN 61000-3-2/GB 17625.1	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
	ANSI C63.4 Class B
FCC Part 15 ⁽¹⁾	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.

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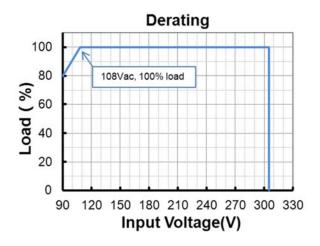
Rev. B

Safety & EMC Compliance (Continued)

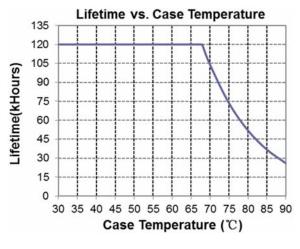
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 4 kV, Common Mode 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
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

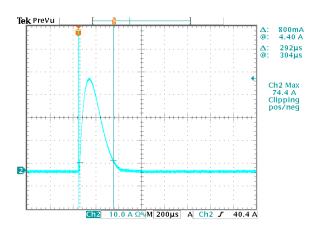


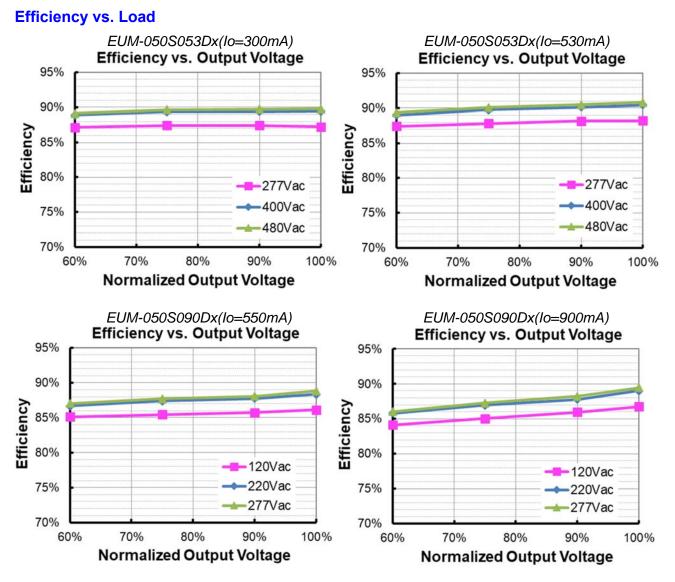
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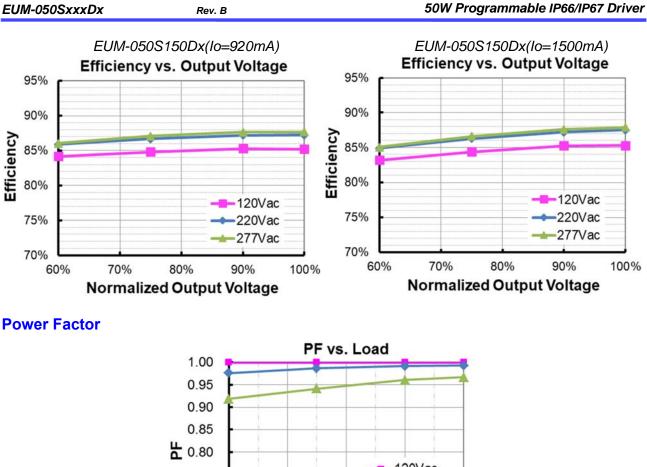
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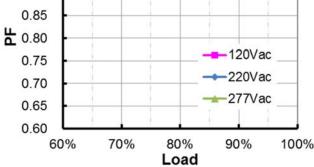
Inrush Current Waveform



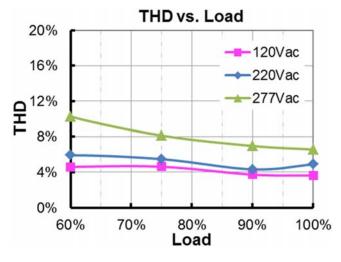


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Total Harmonic Distortion



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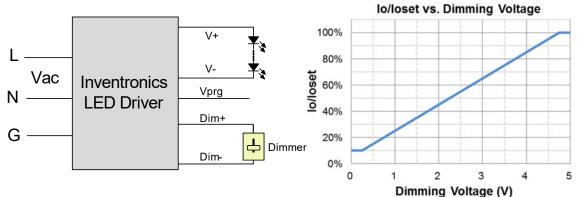
Protection Functions

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.				

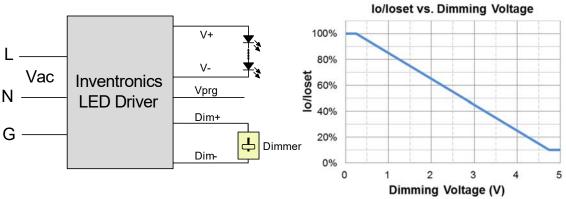
Dimming

• 1-5V Dimming

The recommended implementation of the dimming control is provided below.



Implementation 1: Positive logic



Implementation 2: Negative logic

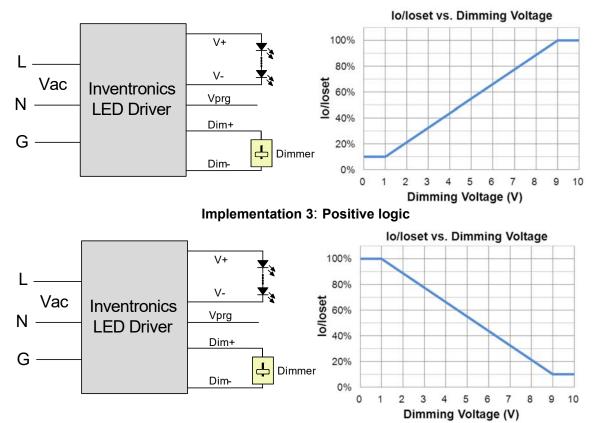
Notes:

- 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.

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• 1-10V Dimming

The recommended implementation of the dimming control is provided below.



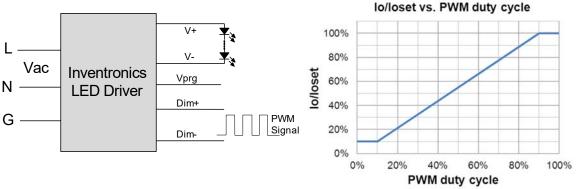
Implementation 4: Negative logic

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

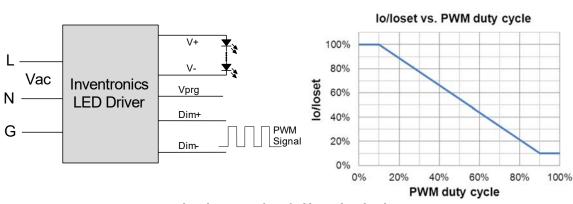
The recommended implementation of the dimming control is provided below.



Implementation 5: Positive logic

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50W Programmable IP66/IP67 Driver



Implementation 6: Negative logic

Notes:

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- 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.

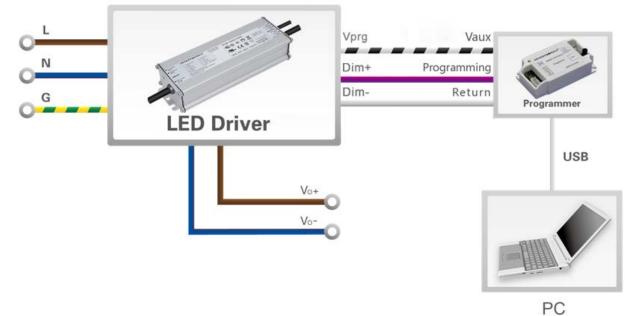
• Output Lumen Compensation

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.

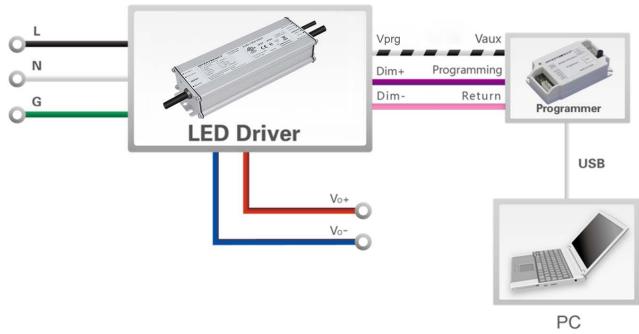
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Programming Connection Diagram EUM-050SxxxDG



EUM-050SxxxDT

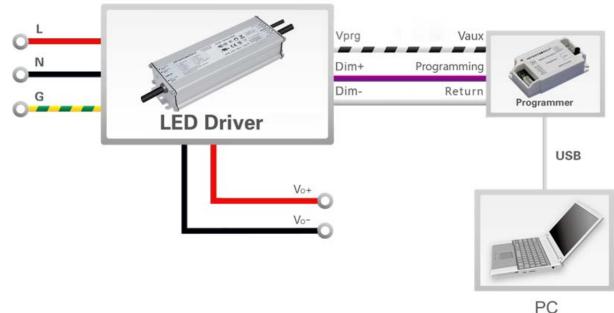


EUM-050SxxxDx

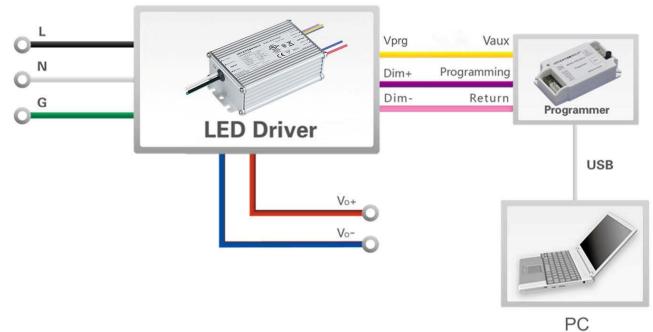
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50W Programmable IP66/IP67 Driver

EUM-050SxxxDB



EUM-050SxxxDF



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

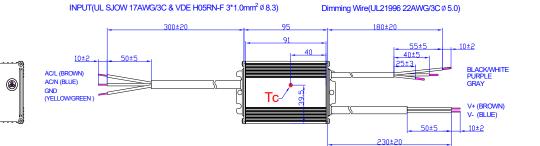
• Please refer to <u>PRG-MUL2</u> (Programmer) datasheet for details.

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Mechanical Outline

EUM-050SxxxDG

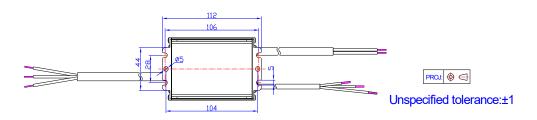
INPUT(UL SJOW 17AWG/3C & VDE H05RN-F 3*1.0mm² Ø 8.3)



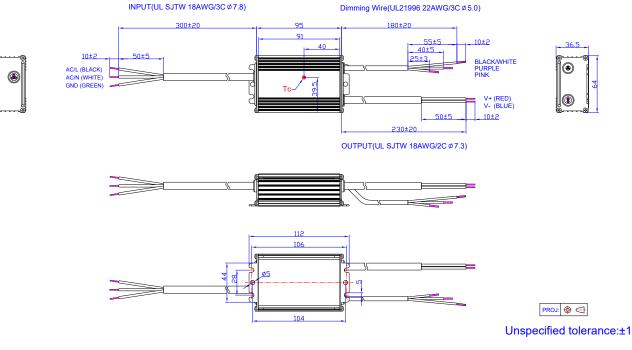


OUTPUT(UL SJOW 17AWG/2C & VDE H05RN-F 2*1.0mm² Ø 7.8)

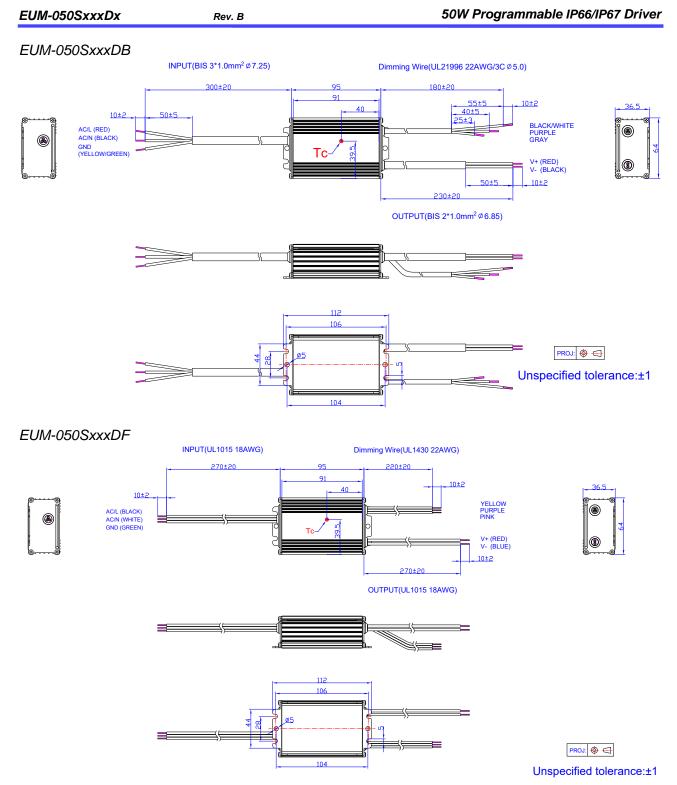




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RoHS Compliance

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.

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Revision History

Change Rev.			Description of Change		
Date	Rev.	ltem	From	То	
2021-01-21	А	Datasheets Release	/	/	
		Product photograph	EUM-050SxxxDF	Updated	
		UKCA logo	1	Added	
		EAC logo	1	Added	
		Models	EUM-050S053Dx	Added	
		Models	Note (5)	Added	
		I-V Operation Area	EUM-050S053Dx	Added	
		Output Current Setting(loset) Range	EUM-050S053Dx	Added	
		Output Current Setting Range with Constant Power	EUM-050S053Dx	Added	
	No Load Output Voltage	EUM-050S053Dx	Added		
		Efficiency at 120 Vac input	EUM-050S053Dx	Added	
2021-12-24	В	Efficiency at 220 Vac input:	EUM-050S053Dx	Added	
			Efficiency at 277 Vac input:	EUM-050S053Dx	Added
			Dimming Output Range	EUM-050S053Dx	Added
		Safety &EMC Compliance	UKCA	Added	
		Safety &EMC Compliance	EAC	Added	
		Efficiency vs. Load	EUM-050S053Dx	Added	
		Dimming	Note	Updated	
		Programming Connection Diagram	EUM-050SxxxDT	Updated	
		Programming Connection Diagram	EUM-050SxxxDF	Updated	
		Mechanical Outline	EUM-050SxxxDT	Updated	
		Mechanical Outline	EUM-050SxxxDF	Updated	