

LED Driver

EUCO ARENA SPORT 1400 W Series

EUCO ARENA SPORT

Highlights & Features



Model Number: EUCO-1K4200G□A□□

Unit Weight: ~5.4kg

Dimensions (L × W × H): 500x152x77 mm

- 2 independent programmable output channels
- Max. output power 1400W (2×700W/channel)
- Wide input voltage: 198-440VAC
- Ultra high Efficiency (97.9% Typ.)
- Programmable output current range 700-2000 mA
- Configurable single channel or multi-channel by DALI-2 & D4i or RDM/DMX (2 × DT6 or 2 × DMX)
- Wide dimming range 0.1%-100%
- Low current ripple (1%)
- Flicker free for HDTV broadcasting
- After-glow effect free
- High-accuracy integrated power metering
- Constant Lumen Output (CLO)
- Smart Timer Dimming (STD)
- Input surge protection: DM 10kV; CM 10kV
- IP66 & IK08 approval enclosure
- Max remote distance 300 meters

General Description

Delta EUCO ARENA SPORT 1400W series is a compact-single output LED driver, which is designed to provide ultimate flexibility and reliability to operate under a wide range of temperatures while retaining highly accurate specifications over its lifetime. The EUCO-1400W makes an ideal solution for Stadium Lighting due to its low ripple current level and flicker free, which is indispensable for Live or HDTV broadcasting conditions. Also due to its robust design, the EUCO-1400W is well-suited for industrial lighting, high mast lighting, and horticulture applications. This driver supports multiple dimming functions with a wide dimming range, which includes DALI-2 with D4i certification, RDM/DMX and autonomous dimming (STD and CLO), which ensures adaptability for dynamic atmospheres and seamless event adjustments. The EUCO-1400W driver offers a remote-control function, allowing the driver to be installed up to 300 meters from the luminaire, which provides greater flexibility in installation, operation, and easy maintenance.

Model Information

Model Number	Input Voltage Range	Rated Output Power	Output Channel	Control Interface
EUCO-1K4200GIA	220/400Vac(typical) 198~440Vac(range)	1400 W	2 ¹	DALI-2 & D4i
EUCO-1K4200GDA				RDM/DMX

1. Default setting is a single address. Optionally, user could be able to assign a dedicated address per each channel via GUI programming tool for both DALI-2 and DMX models.

Model Numbering

EU	C	O	-	1K4	□□□	G	□	A	□□
Market Code	Constant Current	Outdoor		Output power 1K4:1400W	Output Current 200:2000mA	i-Programming	Function I: DALI-2 & D4i D: RDM/DMX	Variable A - Standard	Mode series, can be 0~9, A~Z or blank.

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Specifications

Input Ratings / Characteristics

Specification	Min.	Typ.	Max.	Conditions
Nominal Input Voltage	220Vac	-	400Vac	
Input Voltage Range	198Vac	-	440Vac	
Nominal Input Frequency	-	50/60Hz	-	
Input Frequency Range	47Hz	-	63Hz	
Nominal Input Current	-	6.7A	7A	At 220Vac, 25°C, 1400W output
	-	3.7A	4A	At 400Vac, 25°C, 1400W output
Efficiency ²	-	96.7%	-	At 220Vac, 25°C, 350V/2A *2 channels output
	-	97.0%	-	At 220Vac, 25°C, 550V/1.27A *2 channels output
	-	97.4%	-	At 400Vac, 25°C, 350V/2A *2 channels output
	-	97.9%	-	At 400Vac, 25°C, 550V/1.27A *2 channels output
Standby Power Consumption	-	0.3W	-	At 230Vac, Dim OFF, in compliance with Erp (EU) 2019/2020
	-	0.8W	-	At 400Vac, Dim OFF
Power Factor	-	0.99	-	At 220Vac, 25°C, 1400W output
	-	0.98	-	At 400Vac, 25°C, 1400W output
Total Harmonic Distortion	-	6%	-	At 220Vac, 25°C, 350V/2A *2 channels output
	-	10%	-	At 400Vac, 25°C, 350V/2A *2 channels output
Inrush Current (Apk / 50%-us)	-	15A	-	At 220Vac, 50%Apk to 50%Apk time: 2ms
	-	25A	-	At 400Vac, 50%Apk to 50%Apk time: 2ms
Power metering accuracy	-	±1%	±2%	At 220Vac~400Vac, 100% load

2. 100% Load and tested after 30 minutes warming up.

Output Ratings / Characteristics

Specification		Min.	Typ.	Max.	Conditions
Output Channels		-	2 ²	-	2 independent and individually controllable output channels (single address for all channels by default)
Total Output Power		-	-	1400W	All channels
Output Power Range		-	-	700W	Per Output Channel
Default Output Current		-	1250mA	-	
Programmable Output Current Range		700mA	-	2000mA	Operation range refer to Appendix 1
Output Current Tolerance		-	-	±3%	Range from 700 to 2000mA
Output Voltage Range ³		150V	-	550V	All operating conditions shall not exceed this voltage range
Max. No Load Output Voltage		-	-	600Vrms	
Output Current Ripple		-	1%	2%	(ripple = (pk-pk)/avg), at low frequency (<8kHz)
		-	5%	20%	(ripple = (pk-pk)/avg), at high frequency (>15kHz)
Strobe Effects ³		-	-	33 fps	Supports a continuous sequence of 30ms-ON and 30ms-OFF (fps means frame per second)
Output Remote Distance		-	-	300m	The distance is related to the actual application conditions, but the voltage drop on the wire does not exceed 5V.
Turn on Delay Time	DALI version	-	0.7s	1s	Compliant with clause 9.13 of IEC 62386-102:2014
	RDM / DMX version	-	0.7s	1s	Connecting to the controller correctly.
		1.25s	-	2s	No controller or incorrect connection to the controller, compliance with clause 3.5 of ANSI E1.37-1:2012.

3. The OFF period should be within 5s in general, please contact us if any requirements or questions.

2 | All parameters are specified at 25°C ambient for all products unless otherwise indicated.
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Auxiliary Power Supply Ratings / Characteristics ⁴

Specification	Min.	Typ.	Max.	Conditions
Integrated 24V Auxiliary Power Supply				
Operating Voltage	21.6V	24.0V	26.4V	0.1W~6.0W, reference to "DA-".
High frequency ripple of operating voltage	-	-	1.0 V _{pp}	21.6V~26.4V, f _{ripple} > 10kHz
Voltage in no-load condition	-	-	30.0V	Output power < 0.1W
Average output power capability	-	3.0W	-	CC mode load: 4.0mA~125mA (0.1W~3W).
Pulsed output power capability	-	6.0W	-	Dynamic CC mode load: peak load = 250mA/2.2ms and avg load = 4.0mA~125mA/3.8ms.
Start-up time	-	-	0.6s	From AC power on to V _{aux} increases and reaches 21.6 V, Mains is applied at any phase angle.
Integrated DALI-2 Bus Power Supply				
DALI-2 Bus voltage	12V	-	22.5V	CC load: 0~50mA, integrated bus power supply is pre-configured to a disabled state, and it can be activated via GUI or DALI controller.
Over Current Protection	50mA	-	62.5mA	Auto recovery and no component damaged. Limits output current to 50~62.5mA when output is short-circuited.

4. This part applies to DALI version only: EUCO-1K4200GIA.

Dimming Control

Specification	EUCO-1K4200GIA		EUCO-1K4200GDA
Control interface	DALI-2 & D4i		RDM/DMX
Dimming range	Logarithmic	0.1%-100% (2mA-2000mA, DALI default dimming mode)	
	Linear	0.4%-100% (8mA-2000mA, DMX default dimming mode)	

Control Interface Standards

Specification	EUCO-1K4200GIA	EUCO-1K4200GDA
Control interface standards	DALI-2 & D4i IEC 62386-101 Ed 2.0 IEC 62386-102 Ed 2.0 IEC 62386-207 Ed 2.0 IEC 62386 part 150: Integrated 24Vdc auxiliary power supply IEC 62386 part 250: Integrated bus power supply IEC 62386 part 251: Memory bank 1 extension (luminaire data) IEC 62386 part 252: Energy report IEC 62386 part 253: Diagnostics and maintenance	RDM/DMX ANSI E1.11 DMX512A ANSI E1.20 RDM – Remote Device Management ANSI E1.37-1 Additional message sets for dimmer

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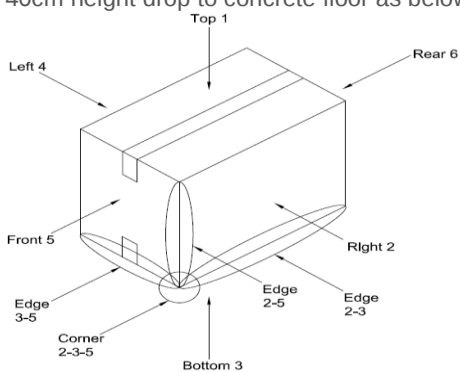
Additional Dimming Features

Specification	EUCO-1K4200GIA	EUCO-1K4200GDA
Smart Timer Dimming (STD)	CLO is a function to make the brightness consistent by compensating the ageing of the light source over the lifetime. It's available in GUI to set starting dimming level (for example 90%) and end of life of the product (for example 50khrs), so that the driver by counting its functioning hours can do a linear interpolation in between starting dimming level at t=0hrs, and go to 100% at t=end of life. This function is not activated by default. For more details, please refer to "LNA/EUCO Series Programming Tool User Manual".	
Constant Lumen Output (CLO)	CLO is a function to make the brightness consistent by compensating the ageing of the light source over the lifetime. It's available in GUI to set starting dimming level (for example 90%) and end of life of the product (for example 50khrs), so that the driver by counting its functioning hours can do a linear interpolation in between starting dimming level at t=0hrs, and go to 100% at t=end of life. This function is not activated by default. For more details, please refer to "LNA/EUCO Series Programming Tool User Manual".	

Mechanical Characteristics

Specification	EUCO-1K4200GIA	EUCO-1K4200GDA
Housing	Aluminum case, Dark Gray, compliance with C5 environment (ISO 9223)	
Dimensions (L x W x H)	500x152x77 mm	
Unit Weight	~5.4 kg	
Cooling System	Natural Convection	
INPUT	With the sign of L1, L2, PE	
OUTPUT	With the sign of PE, NTC, V2+, V2-, V1+, V1-	
DIMMING	DA+, DA-, +24V	D1+, D1-, COM

Environment & Package

Specification	EUCO-1K4200GIA	EUCO-1K4200GDA
Ambient Temperature	Operating	-40 ~+ 50°C
	Storage	-40°C to +85°C
Maximum Case Temperature	+85°C	
Lifetime Case Temperature	+80°C	
Relative Humidity	Operating	10% to 95% RH (Non-Condensing)
	Storage	5% to 95% RH (Non-Condensing)
Audible Noise (30cm distance)	Sound Pressure Level (SPL) < 24dBA	
Ingress Protection classification	IP66	
Impact Protection classification	IK08	
Drop Test (Non-Operating)	According to ASTM D-775, 40cm height drop to concrete floor as below drawing, total 10 times. 	
Vibration (Non-Operating)	IEC 60068-2-6, Random: 5 Hz to 10 Hz (1G); 30 min per axis for all X, Y, Z direction	

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Packing	1pcs per carton
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Protections

Specification		Min.	Typ.	Max.	Notes
Input Under Voltage Protection (IUVP)	Protection	160Vac	-	180Vac	The driver shuts down and then restarts to normal status when the fault condition is cleared.
	Recovery	170Vac	-	190Vac	
Input Over Voltage Protection (IOVP)	Protection	460Vac	-	480Vac	
	Recovery	440Vac	-	460Vac	
Open Load & Output Over Voltage Protection	Protection	-	-	600Vrms	Hiccup mode. The output voltage shall not exceed 600Vrms under no load, open load or other over voltage conditions.
Constant Output Power Protection		-	720W	-	Output power limited. The driver shall come back to its original programmed current after the fault condition is cleared.
Output Short Circuit Protection		YES			Hiccup mode. Restarts automatically after fault condition is removed.
Internal Over Temperature Protection		YES			Driver OTP, decrease the output current to $20\% \times I_o$ when $T_c \geq 90 \pm 5^\circ\text{C}$, auto recovery when $T_c \leq 80 \pm 5^\circ\text{C}$
Programmable External Over Temperature Protection		YES			Luminaire OTP, the default trigger point is 110°C , output power derating. Refer to Appendix 6 " Programmable External Over Temperature Protection " for more details.

Electro-Magnetic Compatibility (EMC)

Specification	Standards
EMC-Emission Characteristics	
Radiated Emission	EN55015
Conducted Emission	EN55015
Harmonic Current Emission	EN61000-3-2
Voltage Fluctuation & Flicker	EN61000-3-3
EMC-Immunity Characteristics	
Electrostatic Discharge (ESD)	EN 61000-4-2
Radio Frequency Electro-magnetic Fields	EN 61000-4-3
Electrical Fast Transient (EFT)	EN 61000-4-4
Surge (AC Mains) ⁵	EN 61000-4-5 - Common Mode: 10kV (Line to Earth, Neutral to Earth) - Differential Mode: 10kV (Line to Neutral)
Conducted Disturbance	EN61000-4-6
Voltage Dip & Interruptions	EN 61000-4-11

5. Level B, the peak of residual common mode voltage pulse from output +/- to Earth is typically around 2.5kV.

Reliability Data

Specification	Test Conditions / Notes
Lifetime	50,000 hours applicable for 220Vac to 400Vac(50/60Hz) @100% of load, $T_a=45^\circ\text{C}$ (Tcase 80°C), 100,000 hours applicable @ 100% of load, Tcase= 70°C . Appendix 2 " Life Time versus Case Temperature Curve " for more details.

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MTBF	475khrs. at Ta=+45°C Telcordia SR-332
Warranty	5 years, refer to Appendix 8 " Warranty Policy " for more details.

Safety Agencies Approvals

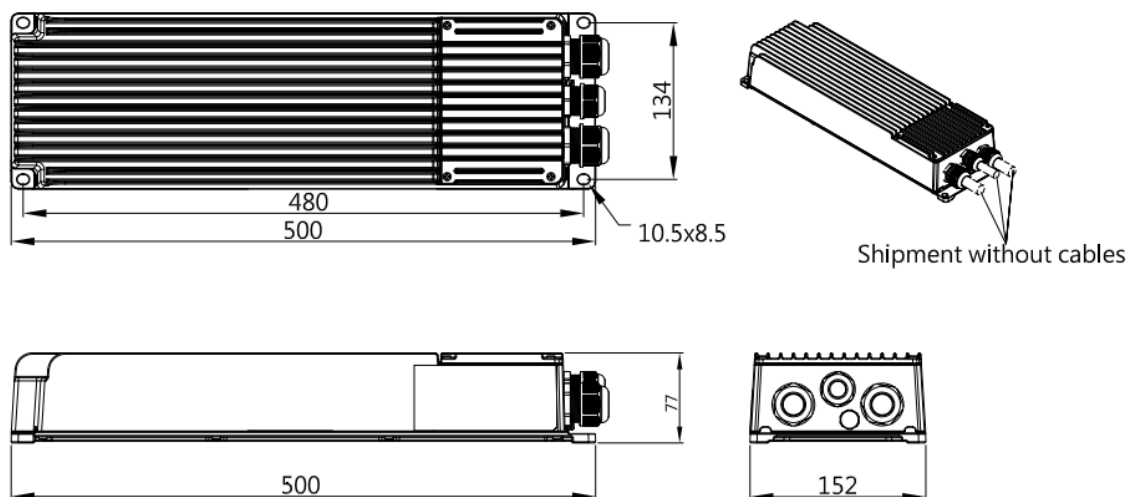
Specification		Test Conditions / Notes
ENEC	MARK	EN 61347-2-13:2014, EN 61347-2-13/A1:2017 EN 61347-1:2015, EN 61347-1:2015/A1:2021 EN IEC 62384:2020
CB	REPORT	CB report.
CE	MARK	EN 61347-2-13:2014, EN 61347-2-13/A1:2017 CE Declaration of Conformity.
UKCA	MARK	BS EN 61347-2-13: 2014+A1:2017
UL	Compliance	ANSI / UL8750 2 nd Ed. , CSA C22.2 No.250.13, 4 th Ed.
RCM	MARK	AS 61347-2-13: 2018 AS/NZS 61347-1: 2016+A1
Isolation		Class I, input to output: non-isolation, RDM/DMX or DALI to input/output: reinforced isolation.
RoHS		RoHS 2.0 Directive (EU) 2015/863
REACH		In compliance

Miniature Circuit Breaker Configuration

The maximum number of LED drivers connectable to a single MCB is recommended in the following table for maximum 1400W and each nominal input voltage. Due to the differences in application conditions and different kinds of miniature circuit breakers available on the market, this table is just for reference.

Input Voltage	MCB Type	10A	16A	20A	25A	32A	40A	63A
220 Vac	B/C/D	1	2	3	3	4	5	9
400 Vac	B	2	3	3	4	5	7	11
	C/D	2	4	5	6	8	10	15

Physical Dimensions

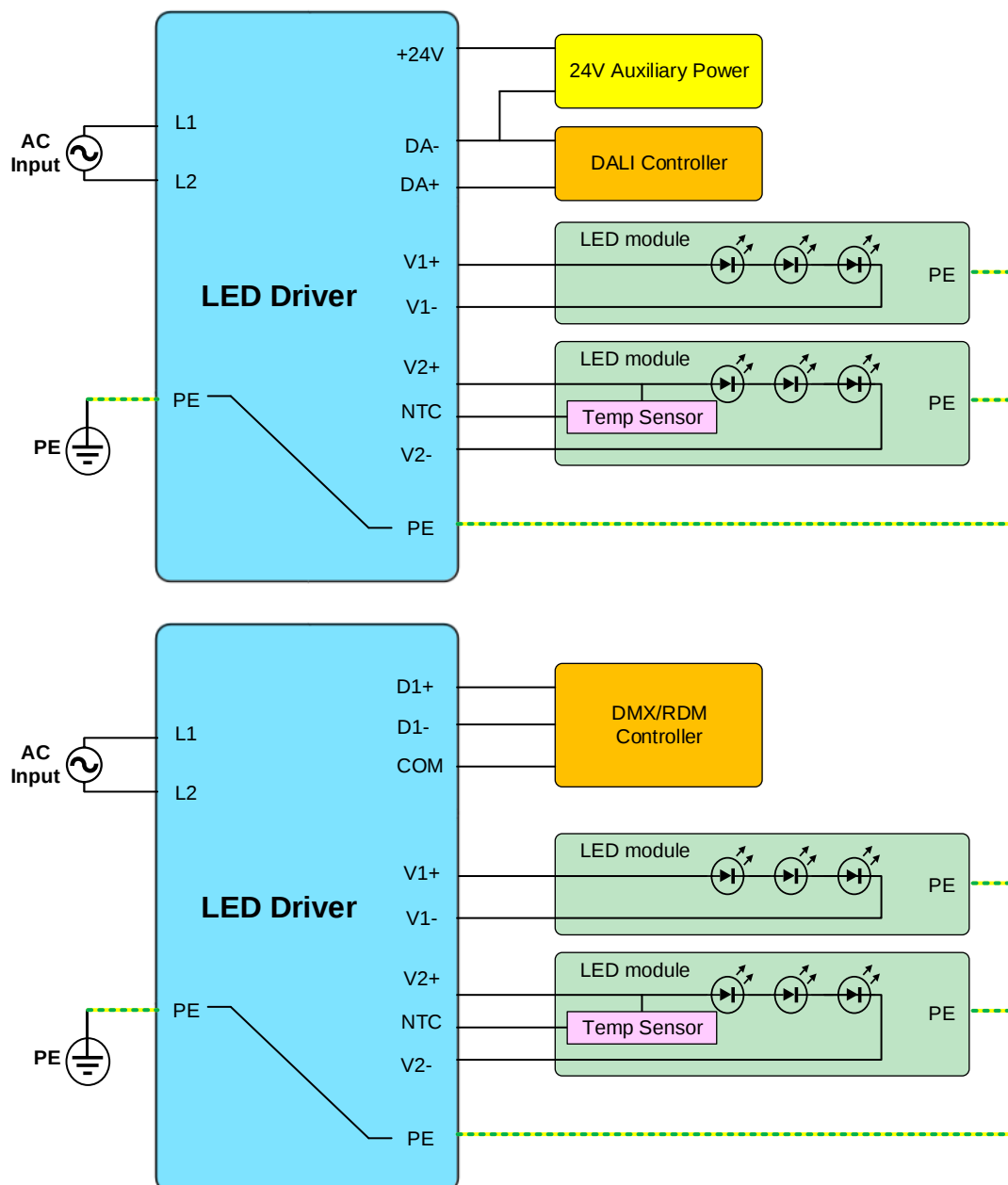


Unit: mm

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Electrical Connection



Note: All the output channels are independent, any series or parallel connections are not allowed, the user should strictly follow the connection schematic.

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Programming Configuration

Common setting functions and implementation methods/conditions are shown in the following table, more functions and details please refer to the GUI user manual.

Item		DALI	DMX
Setup	Tool Connection	DA+,DA-	D1+,D1-
	AC power supply	■	■
	Load Connection	○	○
Tool	Delta Programming Tool	SDDV1505UAC (SDDV1505UAB, SDPTDV05UAB)	
Configurable Parameters and Functions	Current programming	√	√
	Luminaire OTP setting	√	√
	Constant lumen output setting	√	√
	Smart timer dimming	√	√
	Address mode	√	√
	Software update	√	√

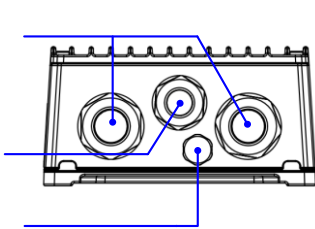
Note: ■ Required, ○ Optional, √ Available.

Cable Gland

M25 cable gland to housing: 3.43Nm

M20 cable gland to housing: 3.43Nm

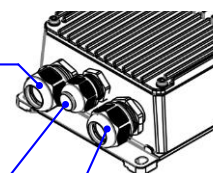
Vent to housing: 0.6~0.8 Nm



Input: M25 cable gland (5 Nm)
Clamping cable: 10.0~16.3mm
1.0~2.5□ AWG 17~12

Control: M20 cable gland, plug by default (1 Nm)

Output: M25 cable gland (5 Nm)



⚠ Do not loosen the Protective Vent

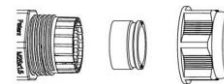
Option A:

Clamping cable (3.5 Nm)
6.3~11.3mm(1 hole seal)
1.0~2.5□ AWG 17~12



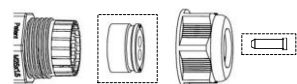
Default:

Clamping cable (5 Nm)
10~16.3mm(1 hole seal)
1.0~2.5□ AWG 17~12



Option B:

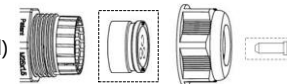
Clamping cable (3.5 Nm)
5.0~6.5mm(2 holes seal)
0.3~2.5□ AWG 22~12



The 2 holes seal and plug are in the plastic bag.

Optional:

Clamping cable (5 Nm)
5.0~6.5mm(2/3 holes seal)
0.3~2.5□ AWG 22~12

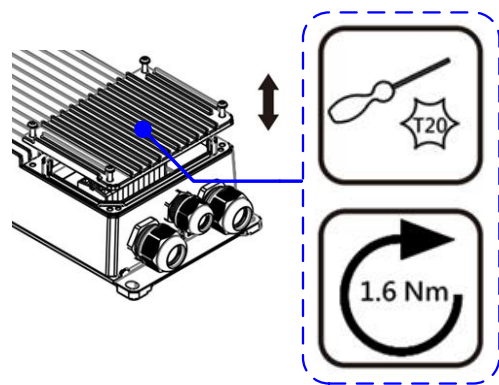


The 2/3 holes seal and plug are in the plastic bag.

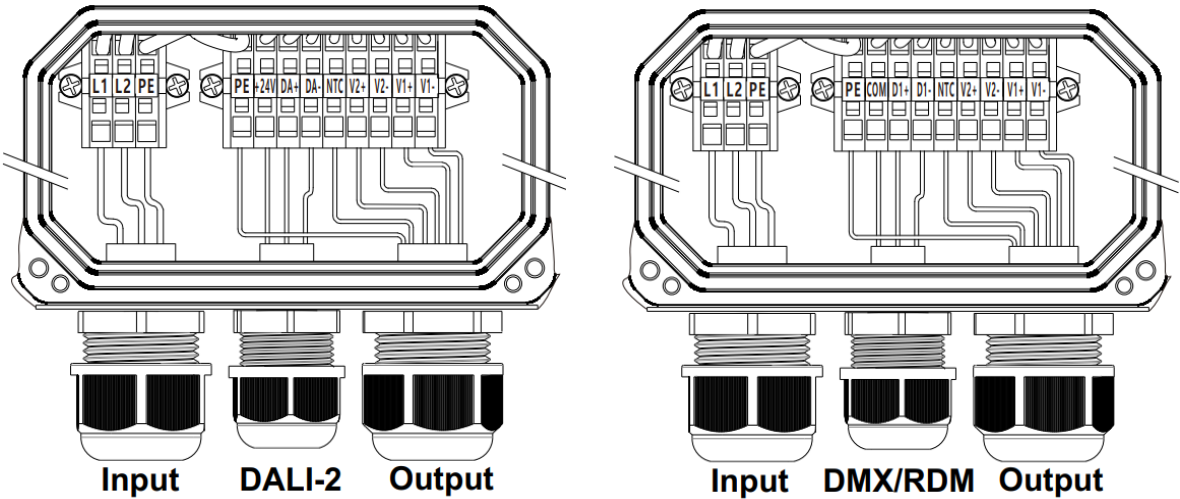
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Junction Box



Note: The cap and fastening 4 screws all have the function of anti-falling off.



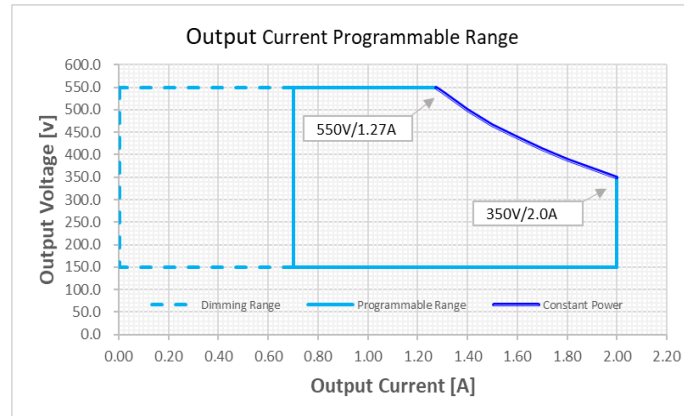
Number	Marker	Description
1	L1	AC input
2	L2	AC input
3	PE	Protective Earth
4	PE	Protective Earth for luminaire
5	+24V	GIA : +24V/3W auxiliary power supply
	COM	GDA : DMX Common port/Shield
6	DA-	DALI signal -, and the ground of "+24V"
	D1-	DMX signal -
7	DA+	DALI signal +
	D1+	DMX signal +
8	NTC	Luminaire Temperature Detection
9	V2+	Channel 2 output +
10	V2-	Channel 2 output -
11	V1+	Channel 1 output +
12	V1-	Channel 1 output -

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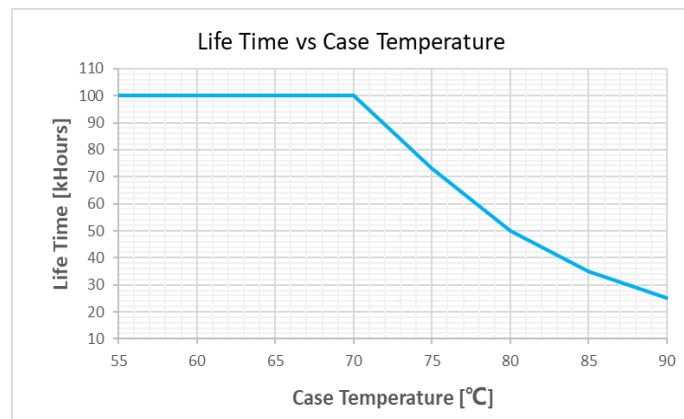
Appendix

1. Operating Range Curve



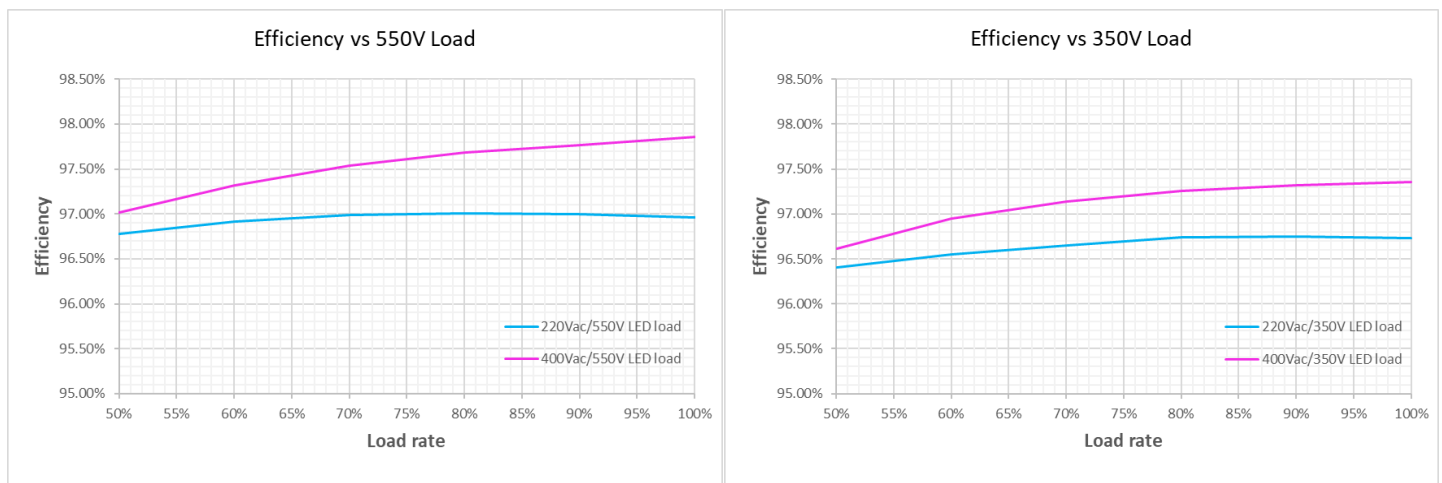
Note: EUCO ARENA SPORT 1K4 series can be programmed with wide output current through computer and programming tool. For more details, please refer to DALI programming User Manual or RDM/DMX programming User Manual.

2. Life Time versus Case Temperature Curve



Note: Test at input voltage 220Vac & 400Vac, at full Load with each channel 2.0A/350V.

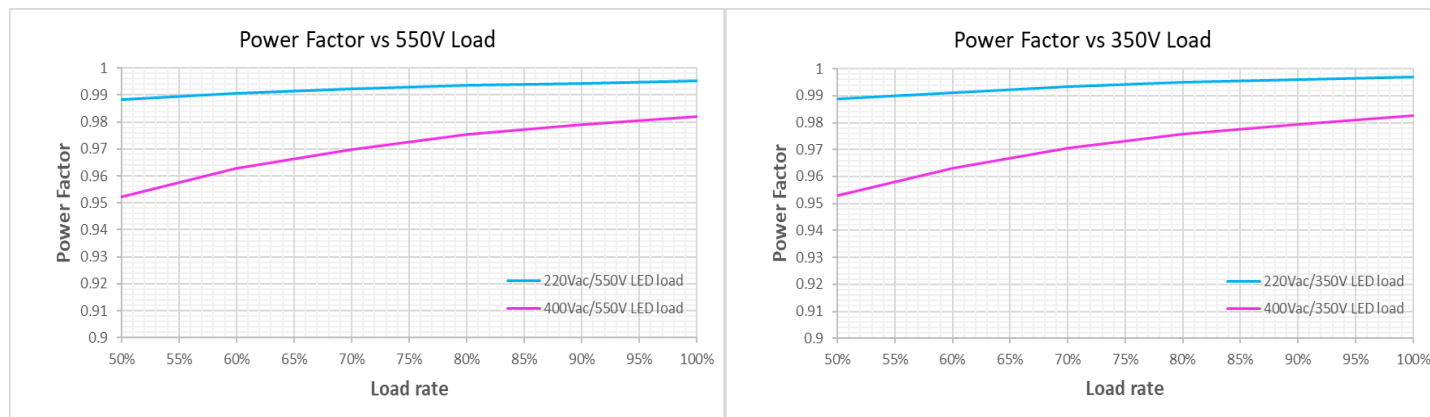
3. Efficiency versus Load



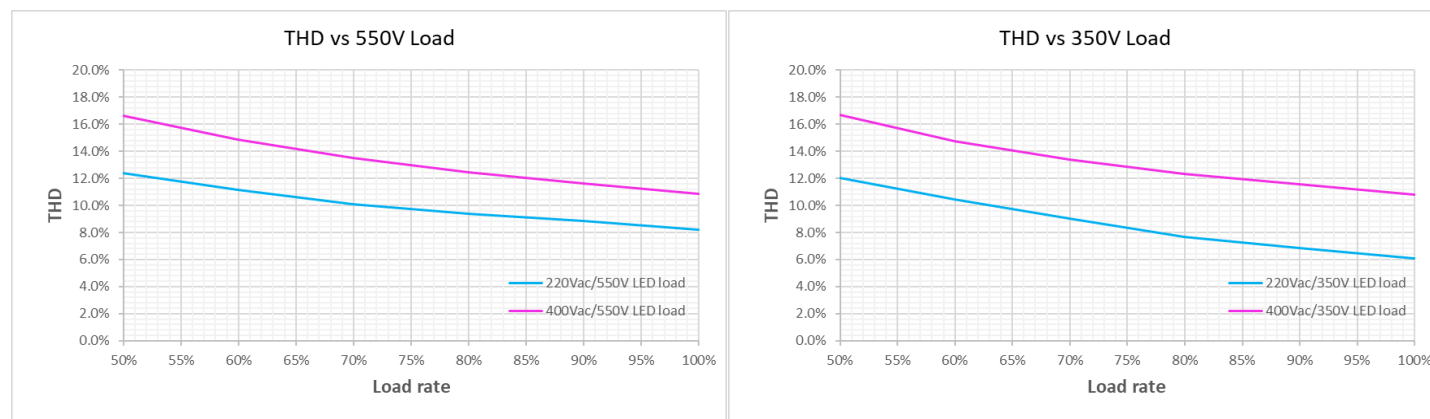
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4. Power Factor versus Load

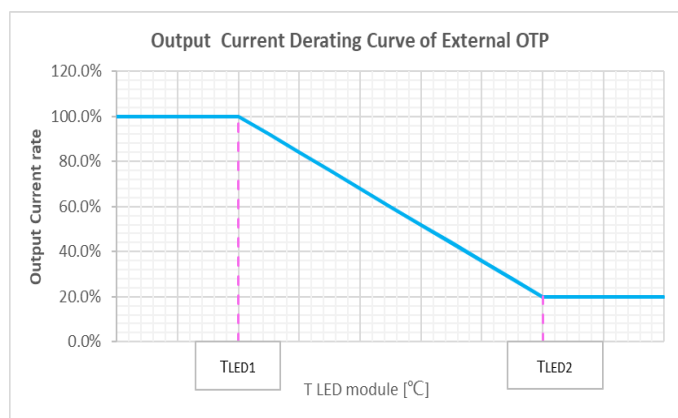


5. THD versus Load



6. Programmable External Over Temperature Protection

This protection is an optional feature and user can ignore it without connecting to NTC connector in the junction box. The driver monitors the temperature of the LED module through NTC terminal. The output current will be reduced smoothly and linearly at OTP status and return to normal when the fault condition is removed.



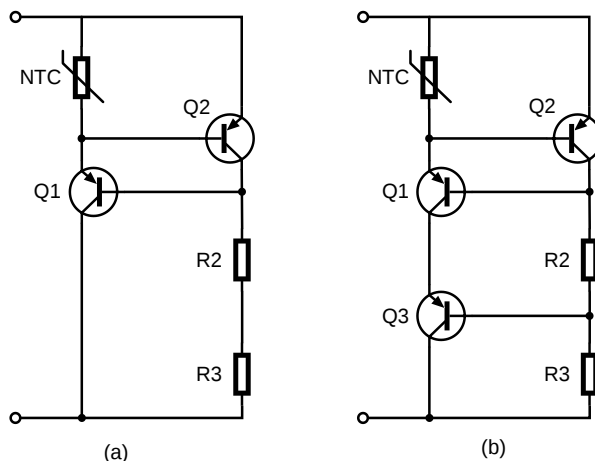
The trigger point of this protection can be set easily according to the actual conditions of the LED fixtures, the user can set the trigger point between 80°C and 110°C by the Delta programming tool, and the default value is 110°C. When the temperature exceeds the triggering point, the output current will decrease automatically to bring the temperature of the LED module back to safe value. More details about parameter setting please refer to DALI programming User Manual or RDM/DMX programming User Manual.

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An external temperature sensing circuit is required to achieve the NTC terminal function to prevent the LED fixture from overheating.

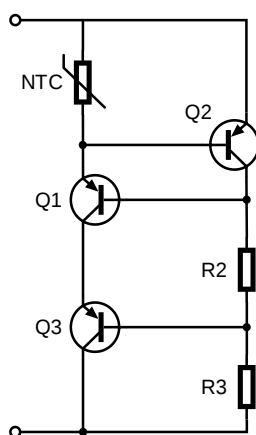
The default setting is for a 33Kohm NTC, the circuits shown as both (a) and (b) below are acceptable.



Parameter	Part	Manufacturer	Description
NTC	TSM1A333F3952RZA	THINKING	RES NTC 33Kohm F 3950K +/-1% SMD 0603 TP
R2 / R3	RC1206FR-07 5M1L	YAGEO	RES SMD 1/4W 5.1Mohm F 1206
Q1 / Q2 / Q3	PBHV9050T	NEXPERIA	500V 150 mA PNP high-voltage low VCEsat transistor

Note: The circuits of above (a) and (b) have same OTP performance by using the same parts listed in the table, and to achieve good accuracy of OTP, Q2 should be placed close to NTC to make them have same temperature.

This product is also compatible with the circuitry for a 10Kohm NTC, this version could be selected and activated by “OTP on Fixture” section of GUI (Select “10K” in this section). The circuit and BOM table are shown as below.



Parameter	Part	Manufacturer	Description
NTC	B57371V2103H060	TDK	RES NTC 10Kohm F 4480K +/-3% SMD 0603 TP
R2/R3	RC1206FR-07 1ML	YAGEO	RES SMD 1/4W 1Mohm F 1206
Q1/Q2	PBHV9050T	NEXPERIA	500V 150 mA PNP high-voltage low VCEsat transistor

Note: The output voltage need to be over 300V to be effective by using this 10Kohm NTC version. And to achieve good accuracy of OTP, Q2 should be placed close to NTC to make them have same temperature.

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7. External SPD requirement for extra LED fixture common mode surge protection

The EUCO series driver has been designed with a built-in surge absorber which protects against lightning up to CM/DM 10kV level. The built-in surge absorber activates once a common mode surge intrusion occurring, which offers a protection against any unexpected voltage surge to the LED module of $\leq 3\text{kV}$.

Even though, EUCO Arena driver series do not require the installation of an additional SPD protect the driver and LED module against any unexpected surge voltage, it would allow to further strength the robustness protection capability against surge residual voltage of LED modules which allows the fixtures to be marketed globally by attributing different surge protector device (SPD) to meet differing surge levels.

However, Delta Electronics proposes not to install an external SPD at LED module side because it would be unsafe attributable to when this device would be triggered, a high common mode current will generate through driver and SPD that will cause some unexpected and irreversible damage to the driver.

8. Warranty Policy

Please reach out our [Warranty Policy](#) should you require any further clarification.

9. Attention

Delta provides all information in the datasheets on an "AS IS" basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to <http://www.DeltaPSU.com> for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

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