

## Product Datasheet



The global certified BLD-500-C is a dual stage high efficiency smart LED driver. 10kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. It supports not only traditional 4-in-1 control, but also DALI2.0 and other protocols. NFC and cable programming are both available for users. All around protections including digital OTP (internal and external by NTC) with auto-recovery secure 24hour non-stop operation for luminaires.

- Horticultural
- Stadium
- Flood
- Harbor
- UV



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### 500W, Isolated Dimming, NFC Programmable LED Driver

#### ■ Features

- Supply Voltage: 90-305Vac, 380Vac for 2 hours
- Great Surge Immunity 10kV
- -60°C Cold Ambient Startup (Optional)
- 100,000Hour Life @ Tc=75°C
- 7 Year Warranty @ Tc<=75°C
- Customized Endcap for Grow Light
- Active Daisy Chain and Master Mode
- Airset™ NFC Programmability
- +/-2% Output Current Accuracy
- Isolated 0-10V/PWM/Time/DALI2.0 (Optional) Dimmable
- Dim Off with 0.5W Standby Power
- 12V 300mA Auxiliary Power to Power Controllers and Fans (Optional)
- UL Class P, ENEC/CB/CCC SELV Output
- Global Certified Model Available
- Safety according to EN 61347-1, 61347-2-3, 61347-2-13, 62384

#### ■ Model List

Model Number	Input Voltage Range	Output Power	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max	Certification
BLD-500-C210-XYZ	90 ~ 305 Vac	500 W	143-294Vdc	1700mA	2100mA	UL/FCC/CB/ENEC/RCM/EAC/CCC/UKCA
BLD-500-C420-XYZ	90 ~ 305 Vac	500 W	71-147Vdc	3400mA	4200mA	
BLD-500-C11A-XYZ	90 ~ 305 Vac	500 W	27-56Vdc	9000mA	11000mA	

XY=	Dimming Method	Programmable	12Vaux	Dim-off
NN	-	-	-	-
DN	0-10V	Cable	-	<b>No Dim-off as default status, programmed to have Dim-off</b>
EN	0-10V	Cable	300mA	√
TR	Time/Set Current	NFC Wireless	-	-
DR	0-10V	NFC Wireless	-	<b>No Dim-off as default status, programmed to have Dim-off</b>
ER	0-10V/PWM/Time	NFC Wireless	300mA	√
AR	DALI2.0	NFC Wireless	-	√

Z = U, UL cable with ground wire (green)    S, VDE cable/Class I    D, VDE cable/Class II

**Note:** See the **Output Operation Range Section** for programmable model details

**500W, Isolated Dimming, NFC Programmable LED Driver**
**■ Technical Data**

Input Voltage	90~305Vac, 380Vac for 2 hours
Input Frequency	47~63Hz
Power Factor	>0.95@60-100%load, refer to PF vs. Load curve
THD	<15%@60-100%load, refer to THD vs. Load curve
Input Current	4.5Amax@120Vac & Full-Load, 2.7Amax@220Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	1mA max @277Vac 60Hz, UL8750,0.75mAmax @220Vac 50Hz, IEC61347-1
Input Under Voltage	Shut down and auto-restart
Input Over Voltage	*Optional: Shutdown @320Vac
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%lo for programmable model, ±5%lo for non-programmable model
Ripple Current	Ip-p:5%lo max
Setup Time	1.2s max
Overshoot	10% Io max & LED Load
Output Over Voltage	120% Vomax, typ.
Short Circuit	Auto recovery. The output recovers when short is removed.
Over Temperature	Lower the output current when $T_c \geq 105 \pm 10^\circ\text{C}$ ; Auto Recovery When $T_c \leq 70 \pm 10^\circ\text{C}$
Auxiliary Power (Vaux)	12V+/-5%, 300mA max
Operating Temperature	Case Temperature $T_c = -40^\circ\text{C} \sim +90^\circ\text{C}$ ; 10%RH~100%RH
Storage Temperature	-40°C~+85°C; 5%RH~100%RH
MTBF	≥280,000 hours, 75°C case temperature (MIL-HDBK-217F)
Lifetime	≥100,000 hours, 75°C case temperature, refer to life vs. Tc curve
Case Temperature	90°C max, marked in the Tc point of label
Dimensions	8.82x3.54x1.63 by inch (body), 9.88x3.54x1.63 by inch (endcaps included) 224 x 90 x 41.5 by mm (body), 251 x 90 x 41.5 by mm (endcaps included)
Net Weight	1600g
Packing	See Package Information Section in the datasheet

Notes: Unless specified, all the test results are measured in 25°C room temperature.

## ■ Safety/EMC Compliance

Safety Standard	Description
UL8750	Light emitting diode(LED) equipment for use in lighting products
UL1012	Power units other than class 2
IEC 61347-1	Lamp control gear Part 1: general and safety requirements
IEC 61347-2-13	Lamp control gear Part 2-13: particular requirement for d.c. or a.c. supplied electronic control gear for LED modules
EMI Standards	Description
IEC 55015	Conducted emission test & radiated emission test
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4:2009 Class B
EMS Standards	Description
IEC 61000-4-2	Electrostatic discharge (ESD): 8 kV air discharge, 4 kV contact discharge
IEC 61000-4-3	Radio frequency electromagnetic field susceptibility test (RS)
IEC 61000-4-4	Electrical fast transient (EFT)
IEC 61000-4-5	Surge immunity test
IEC 61000-4-6	Conducted radio frequency disturbances test (CS)
IEC 61000-4-8	Power frequency magnetic field test
IEC 61000-4-11	Voltage dips
IEC 61547	Electromagnetic immunity requirements applies to lighting equipment

## ■ Dimming

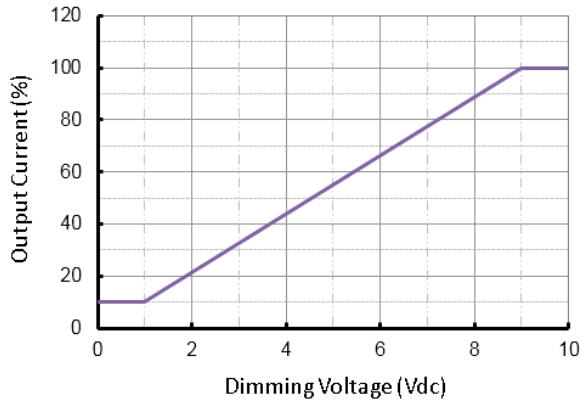
Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
PWM Dimming Range	10% (Duty=10%)	Linear	100% (Duty=90-100%)
Dim off threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Dim on threshold	0.6V or 6%	0.7V or 7%	0.8V or 8%
PWM High	3.8V		10V
PWM Low	0V		0.6V
PWM Frequency	300Hz		2kHz
External PWM Controller Current Sinking Capability	300uA		
DALI Interface Standard	IEC62386, part 101,102,207		
DA1,DA2 High Level	9.5	16	22.5
DA1,DA2 Low Level	-6.5	0	6.5
DA1,DA2 Current	0		2mA

## 500W, Isolated Dimming, NFC Programmable LED Driver

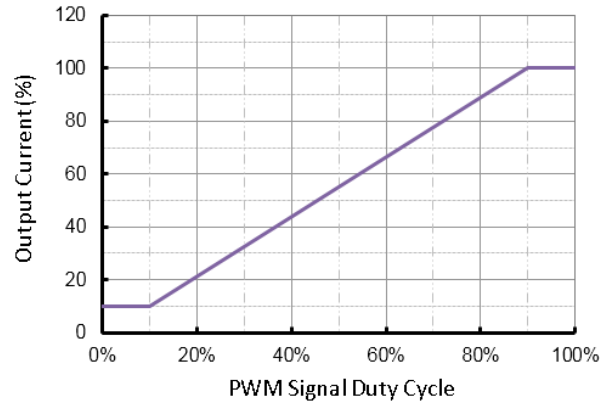
### - Dimming Curve

#### a. Without dim-off

0-10V Dimming Curve

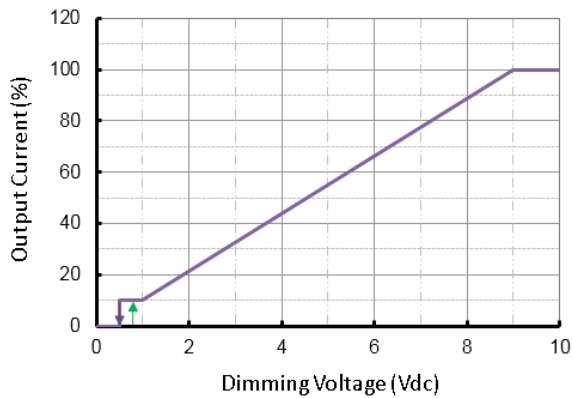


PWM Dimming Curve

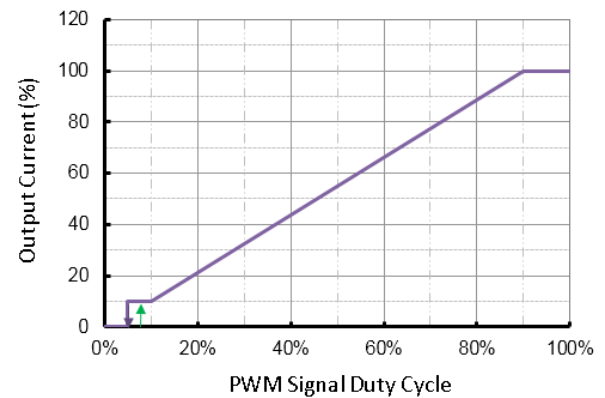


#### b. With dim-off

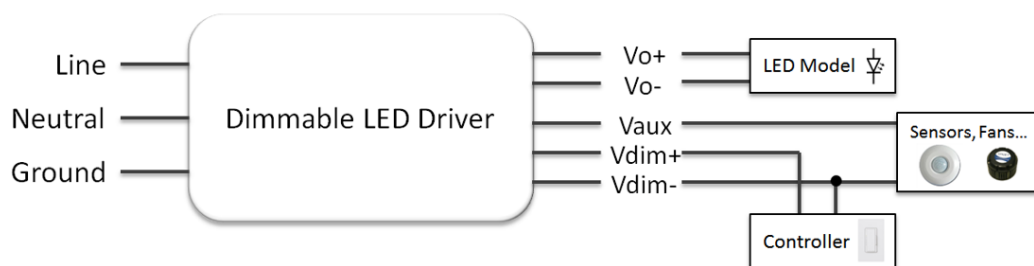
0-10V Dimming Curve



PWM Dimming Curve



### - Dimming Wiring

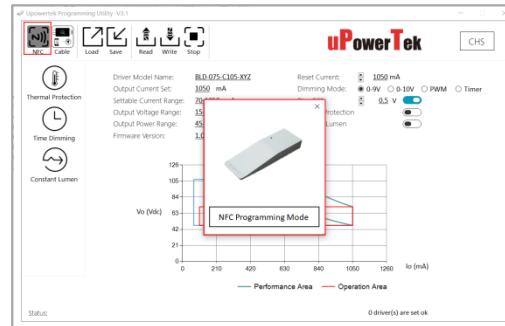
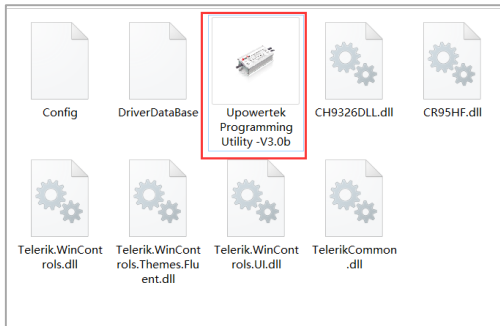


## ■ Programming

### - NFC Programming by PC/Laptop



- Download PC Software at <https://www.upowertek.com/download-2/>
- Click Upowertek Programming Utility.exe
- The GUI start and notify you the programming mode (cable programming or NFC programming)
- Click "NFC" button if it's not NFC programming mode.



### - NFC Programming by Smartphone

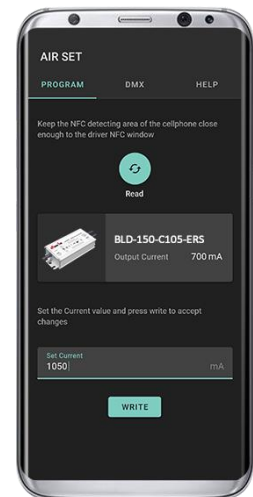
- Download Android APP at <https://www.upowertek.com/download-2/>
- Only available on Android cellphone (iPhone is not supported)
- The cellphone should have NFC function and make sure it is enabled.



- Turn on NFC switch of cellphone, then open the APP by icon below.



uPowerTek  
Airset

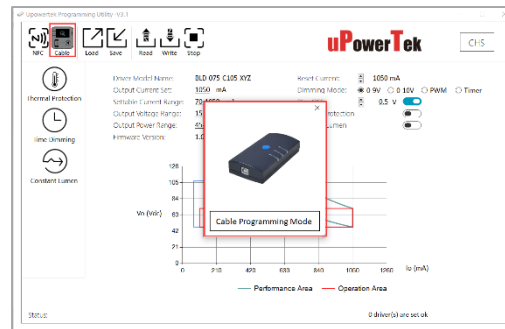
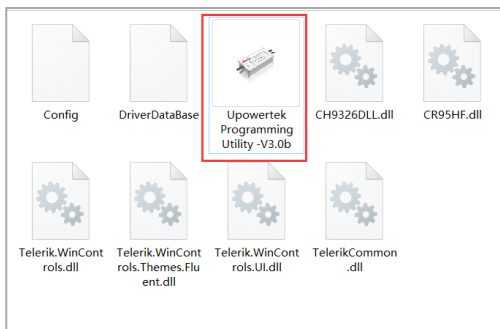


## 500W, Isolated Dimming, NFC Programmable LED Driver

### - Cable Programming



- Download PC Software at <https://www.upowertek.com/download-2/>
- Click Upowertek Programming Utility.exe
- The GUI start and notify you the programming mode (cable programming or NFC programming)

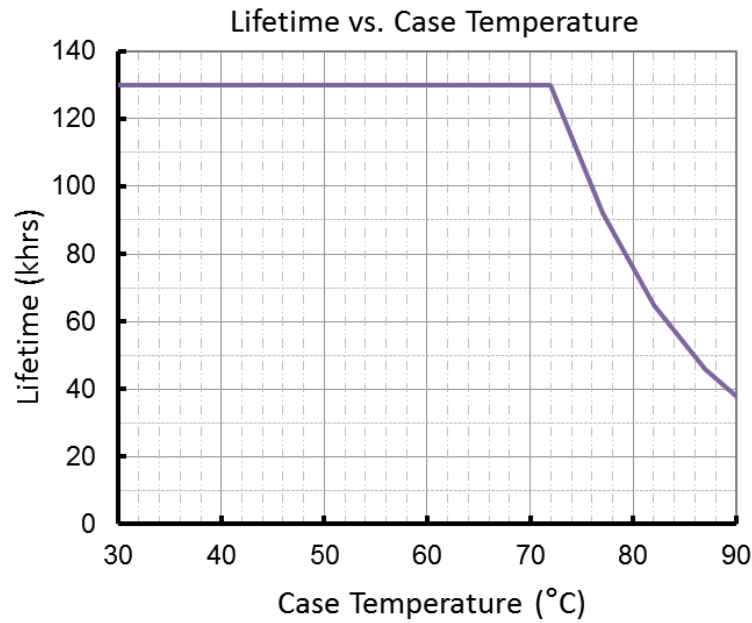


- Click "Cable" button if it's not cable programming mode.
- Connect the Vdim+ and Vdim- wires to the right ones (the same color) of the programmer.

### - Please contact with us for product user manual and more information such as:

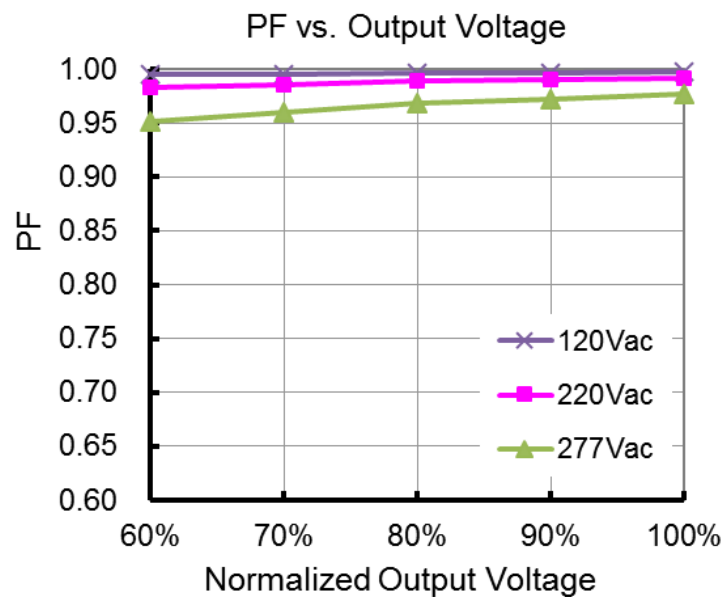
- Output Lumen Compensation
- Luminaire Thermal Protection by External NTC (with extra cable)
- Dimming Curve Customization (dim off threshold, minimum dimming level, maximum dimming voltage etc.)
- Adjustable Startup Time
- Time Dimming (adaptive mid-night, percentage, etc.)
- Customized Control Protocol

## ■ Lifetime vs. Case Temperature

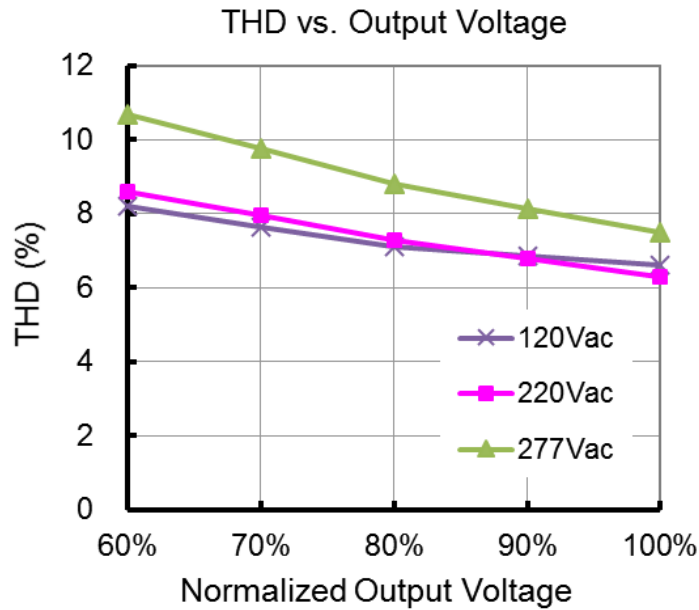


(End of Life: Maximum Failure Rate=10%)

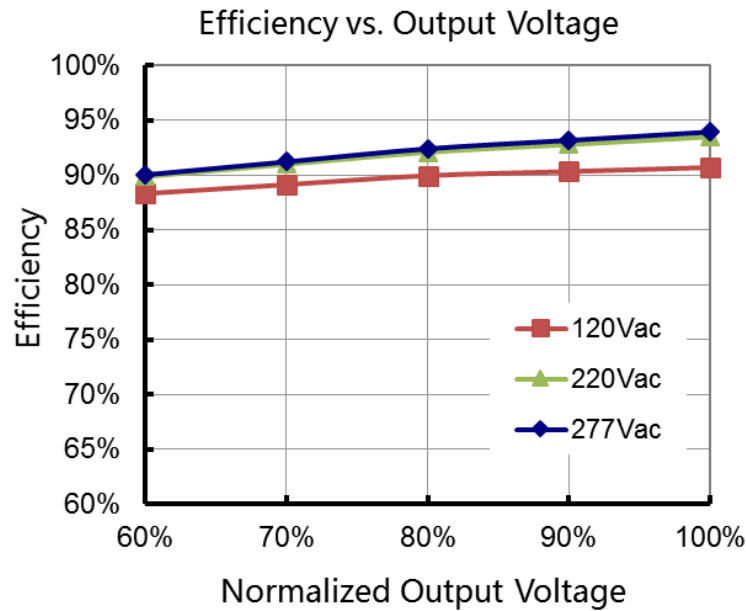
## ■ Power Factor vs. Load



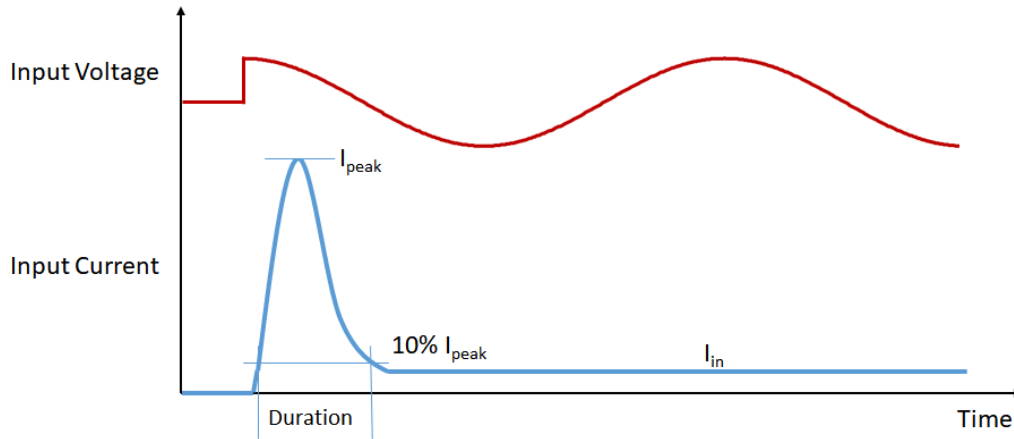
■ THD vs. Load



■ Efficiency vs. Load (2.1A Model)



## Inrush Current



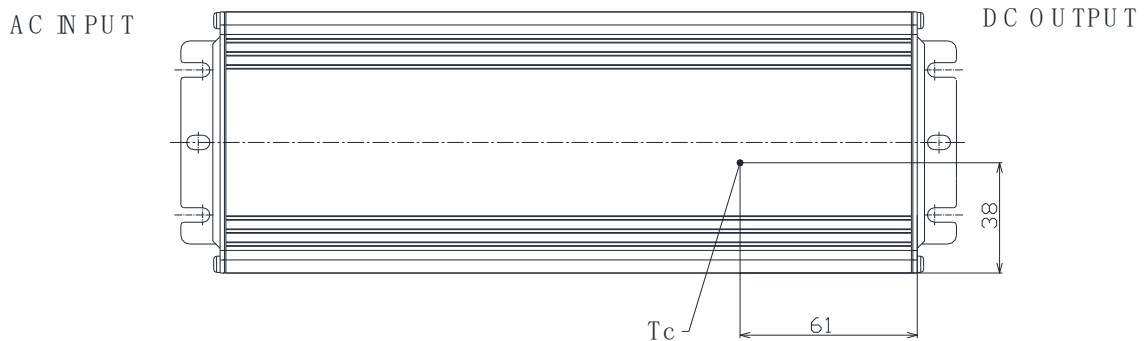
Input Voltage	$I_{peak}$	Duration
120Vac	18.0A	5.32mS
220Vac	30.8A	5.24mS
277Vac	42.2A	5.08mS

Please contact with us for MCB calculation and waveforms.

## Dielectric Strength

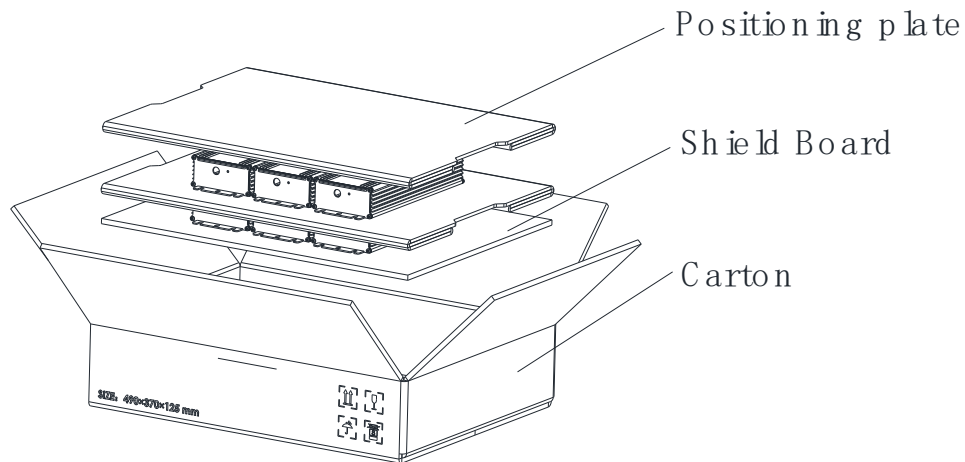
Unit: Vac	Input	Output	Dimming	Case
Input	-	3750	3750	1554
Output	3750	-	1554	1554
Dimming	3750	1554	-	1554
Case	1554	1554	1554	-

## Tc Point



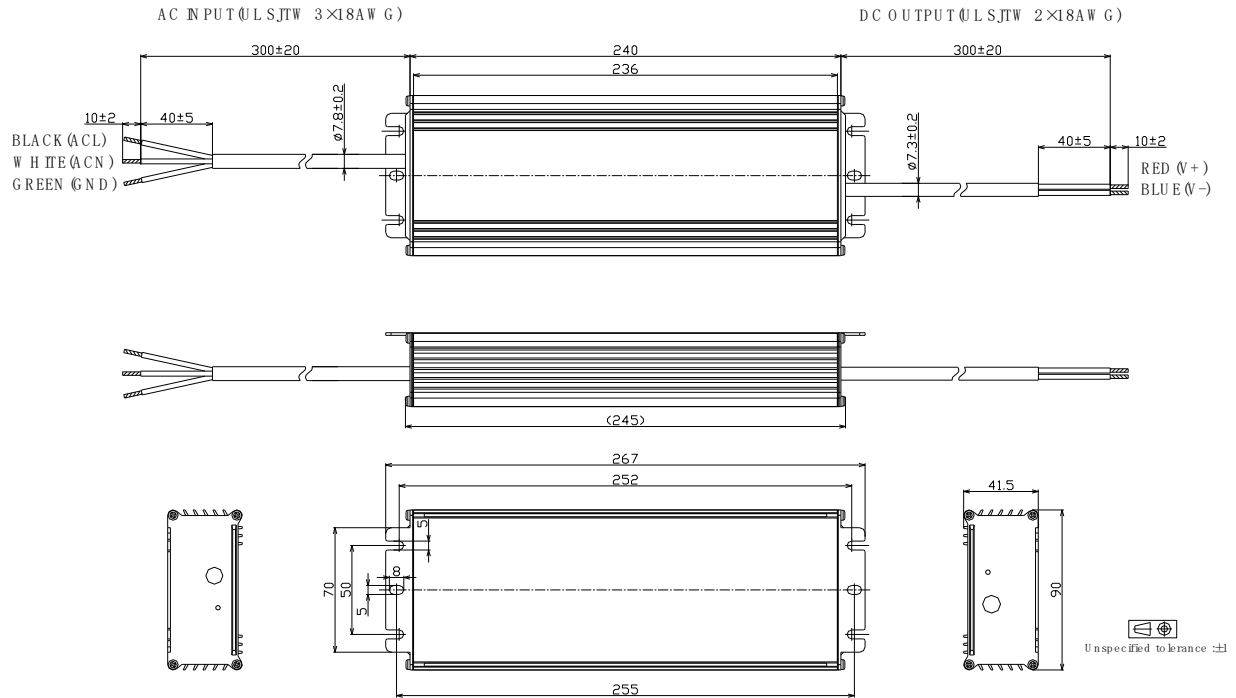
## ■ Packaging Information

Typical Carton Dimension(L×W×H)	490×370×125 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers	6pcs/carton

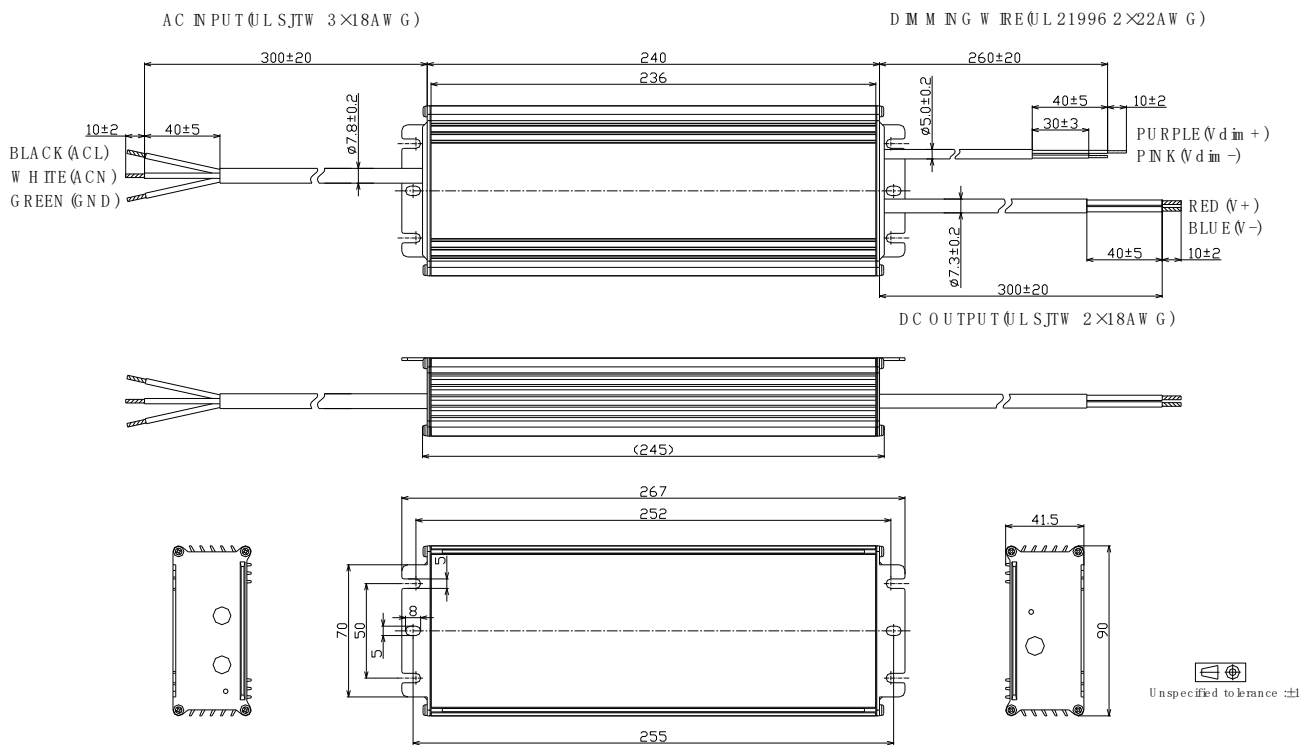


## Mechanical Design

### BLD-500-Cxxx-NN/TRU (UL Cable)

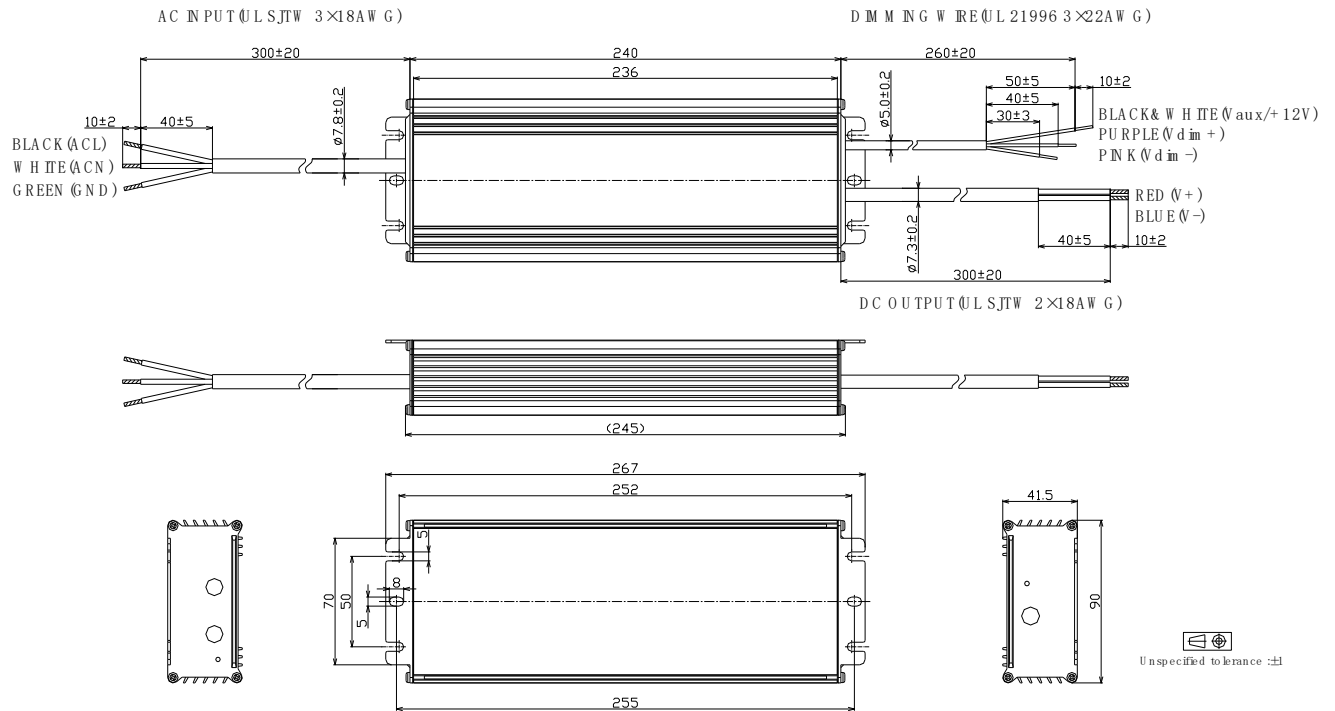


### BLD-500-Cxxx-DN/DRU (UL Cable)

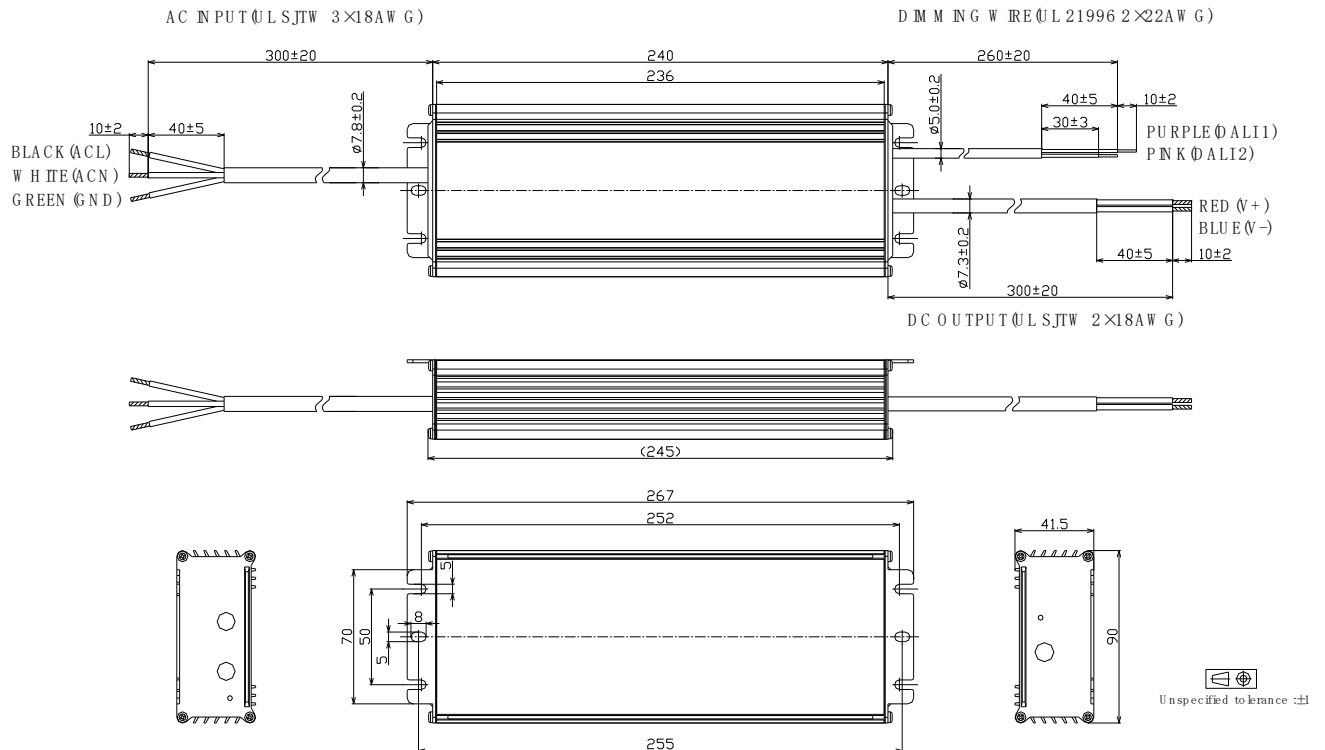


### 500W, Isolated Dimming, NFC Programmable LED Driver

#### - BLD-500-Cxxx-ERU (UL Cable)

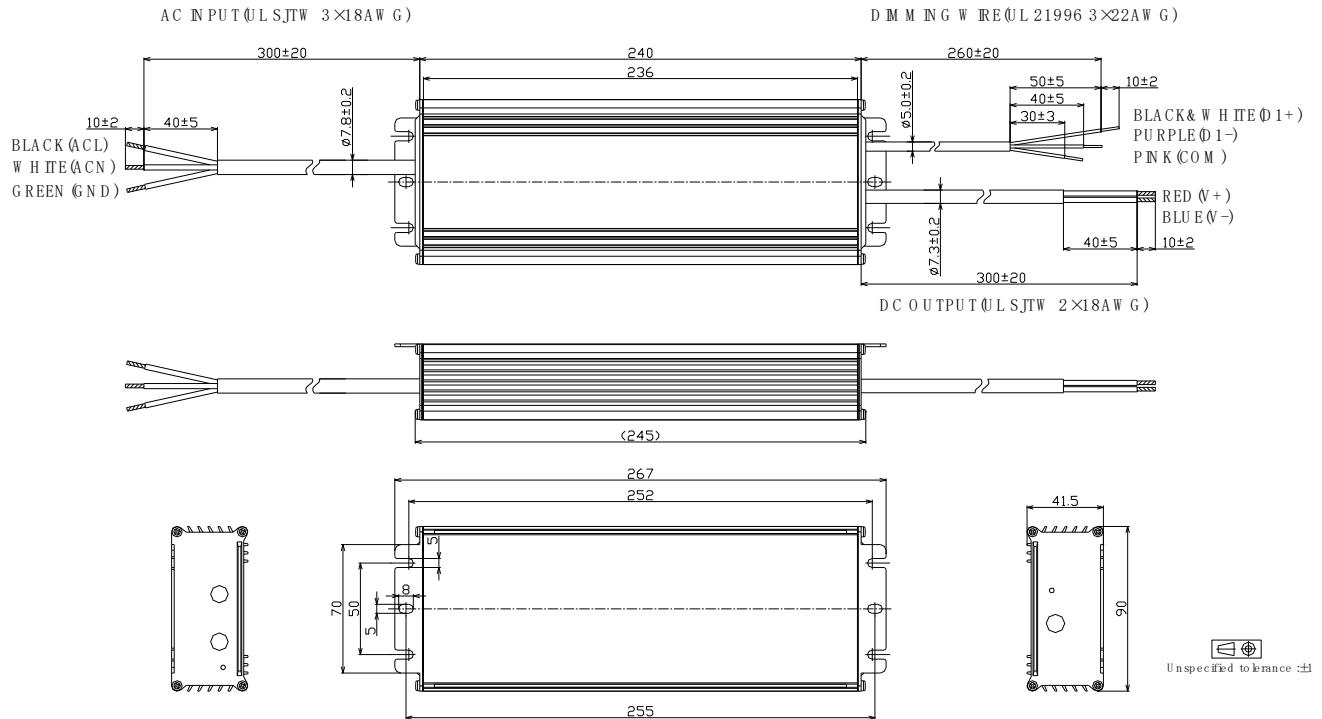


#### - BLD-500-Cxxx-ARU (UL Cable)

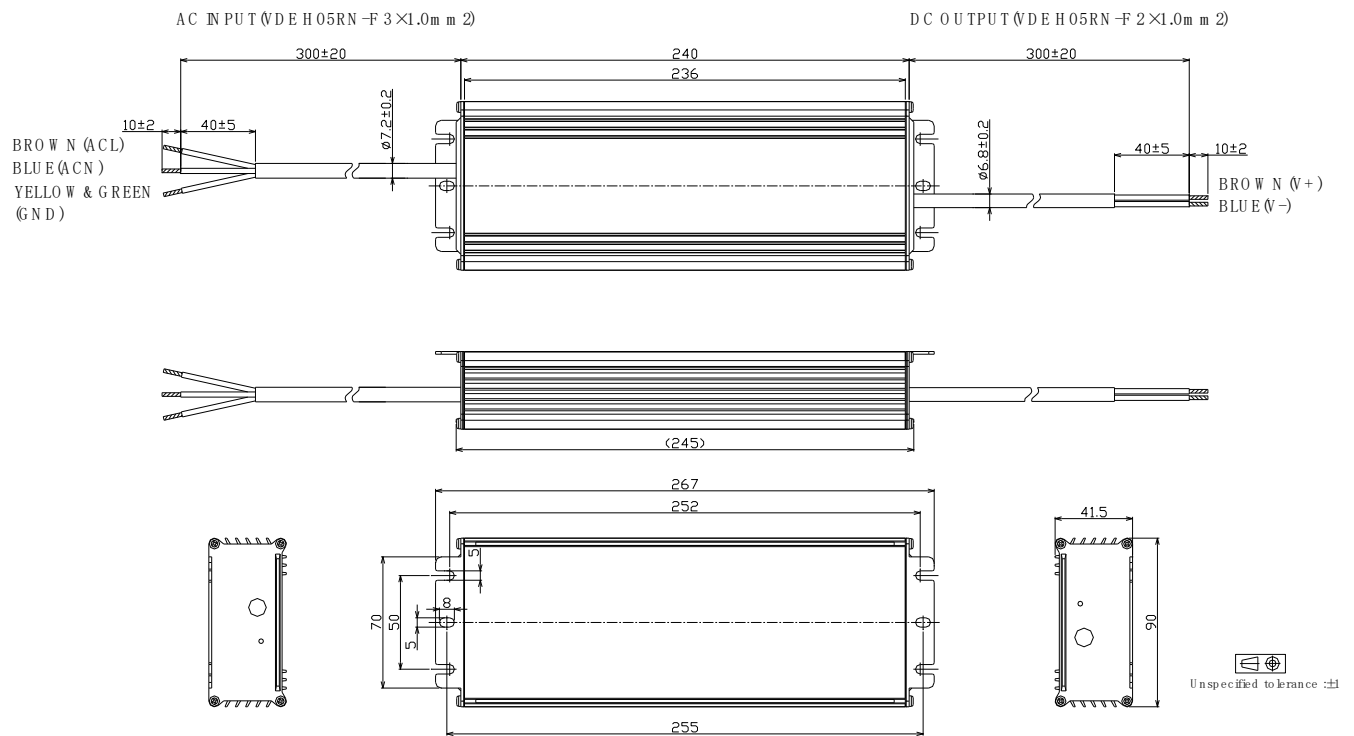


### 500W, Isolated Dimming, NFC Programmable LED Driver

#### - BLD-500-Cxxx-MRU (UL Cable)

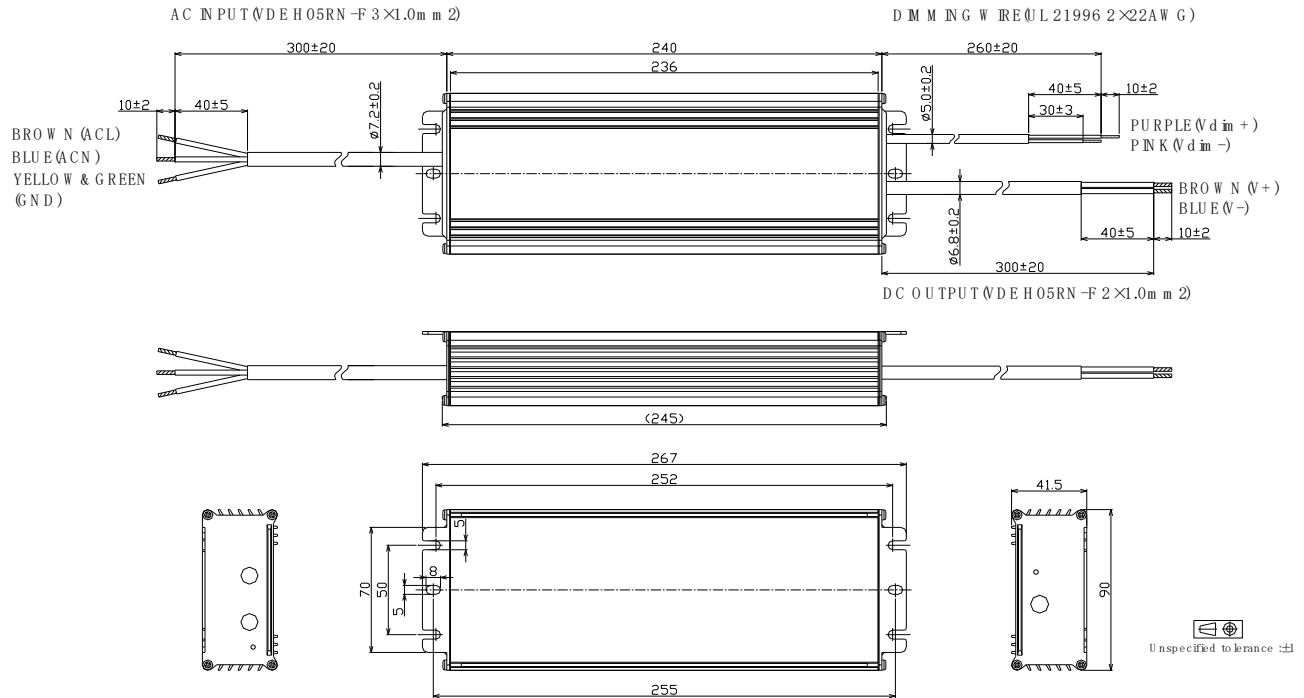


#### - BLD-500-Cxxx-NN/TRS (VDE Cable)

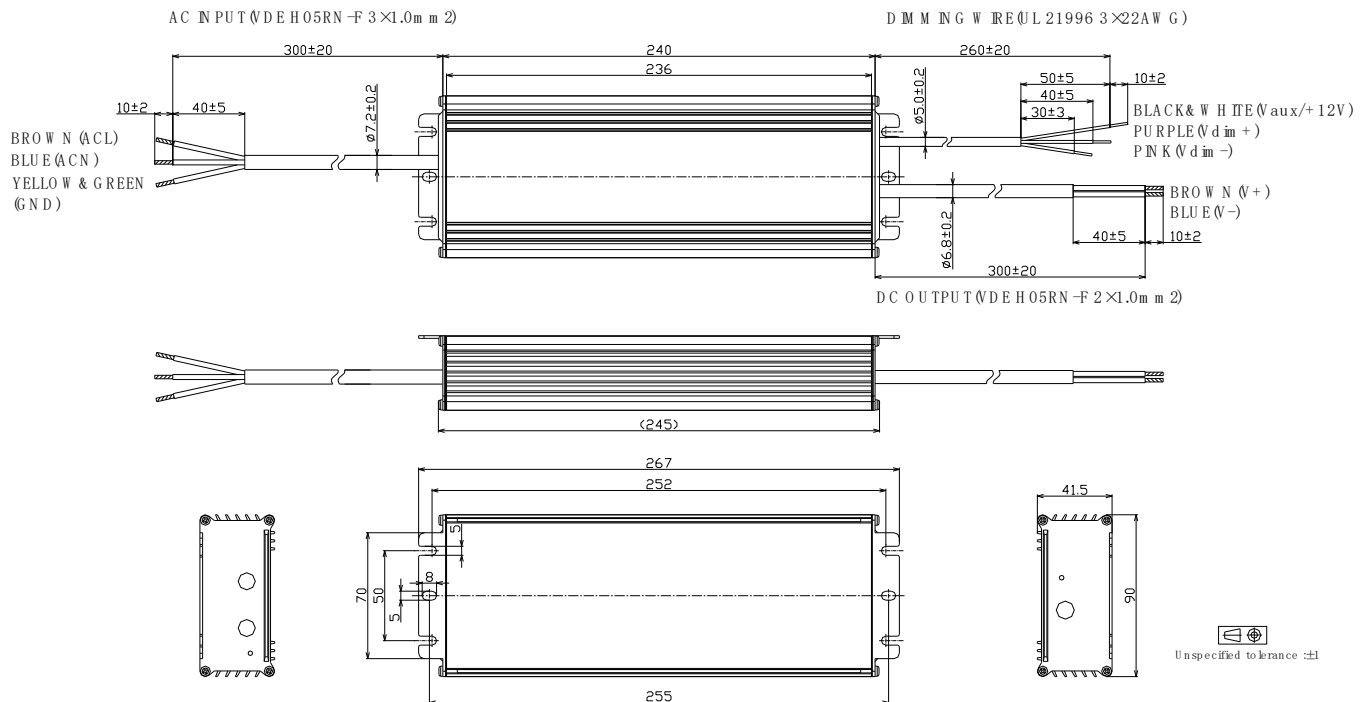


### 500W, Isolated Dimming, NFC Programmable LED Driver

#### - BLD-500-Cxxx-DN/DRS (VDE Cable)

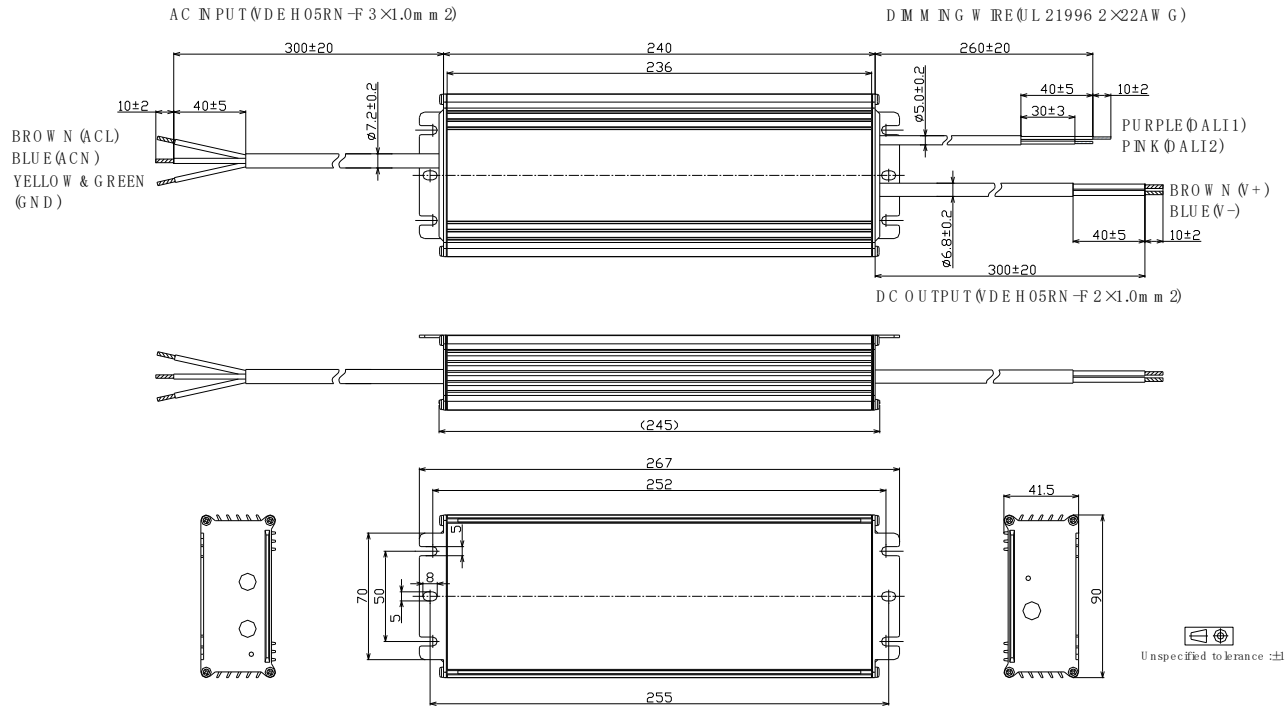


#### - BLD-500-Cxxx-EN/ERS (VDE Cable)

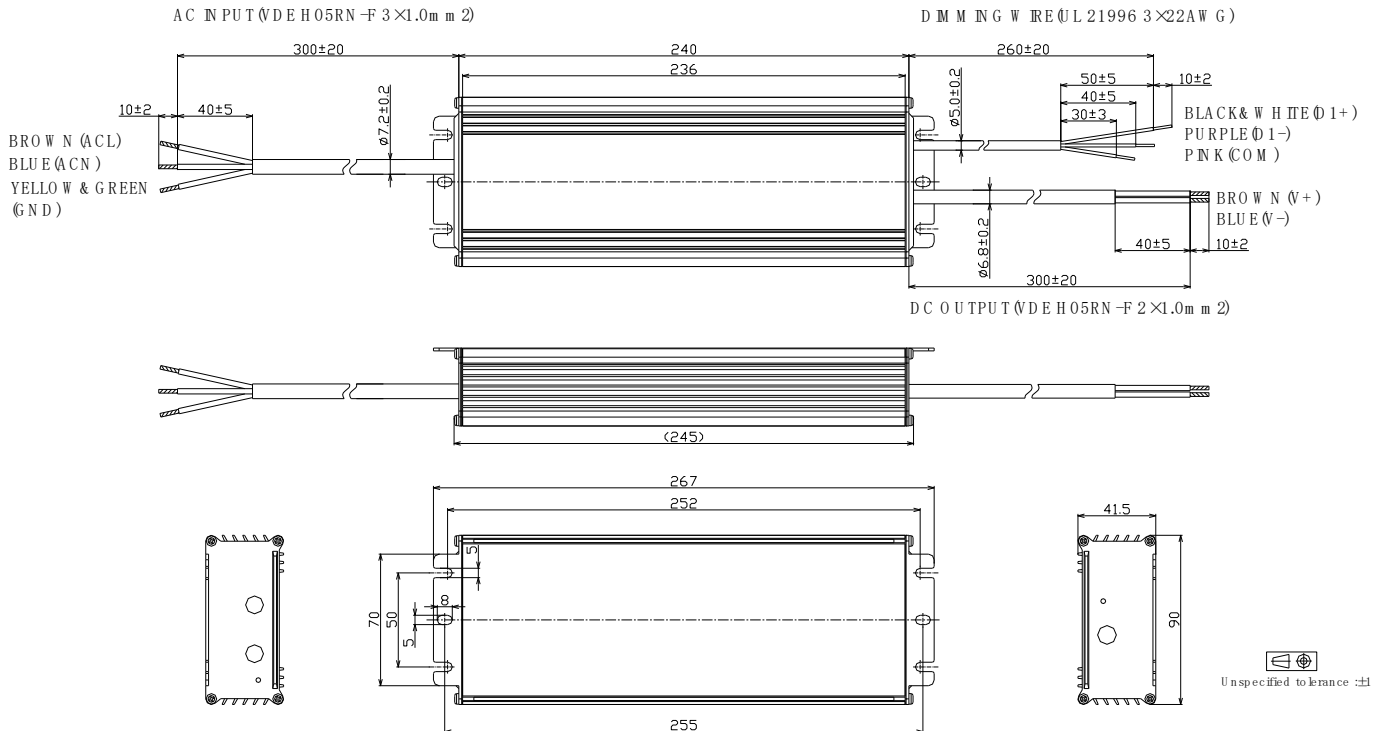


### 500W, Isolated Dimming, NFC Programmable LED Driver

#### - BLD-500-Cxxx-ARS (VDE Cable)

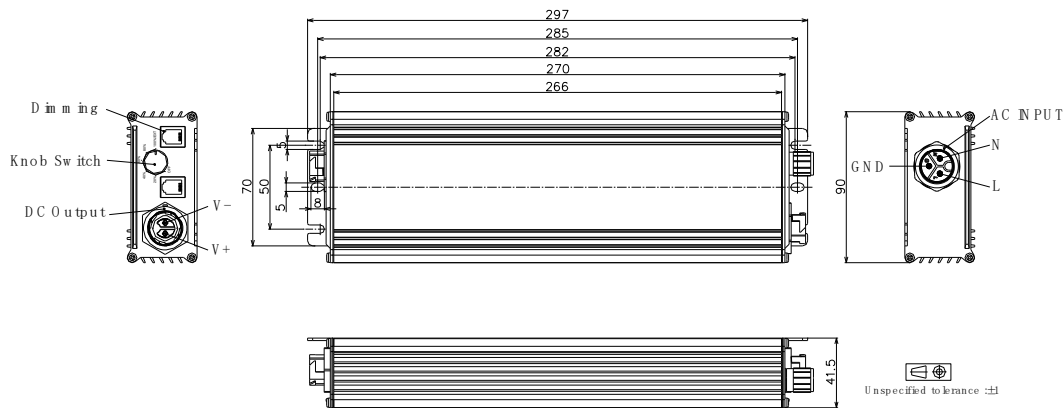


#### - BLD-500-Cxxx-MRS (VDE Cable)



## 500W, Isolated Dimming, NFC Programmable LED Driver

- Customized Functional End Cap Version

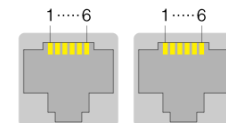


- Add suffix #abcd00 to the end of part number to indicate different configuration. Please refer to product application note AN06 or contact with us for more like **active daisy chain, master mode and button dimming** etc.

Item	Value Definition	Description
Input	a	F: M19 waterproof connector P: C14 plug N: Same cable as standard version
Output	b	F: M19 waterproof connector, 2 pin N: Same cable as standard version
Dimming	c	F: M12 waterproof connector R: RJxx (xx=25,14,12,11) connector x 2 S: 3.5mm multi-media plug N: Same cable as standard version
Knob	d	K: Knob with steps B: Knob without steps N: No knob

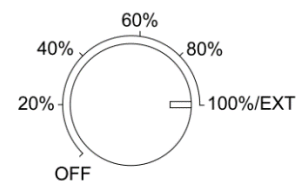
- RJ25 Pin Description (can be customized according to control system)

Pin	Description
1,6	12V Aux-power
2,5	Dim+
3,4	Dim-/RTN



- Knob Description

Position	Description
100%/EXT	If there is no external control, 100% output. If there is external control, output is controlled by external signal.
Off,20%,40%,60%,80%	External signal invalid.



**- Output Operation Range**

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C210	2100	500	143	238	210
	2000	500	150	250	200
	1900	500	158	263	190
	1800	500	167	278	180
	1700	500	176	294	170
	1600	471	176	294	170
	1500	441	176	294	170
	1400	412	176	294	170
	1300	382	176	294	170
	1200	353	176	294	170
	1100	324	176	294	170
	1000	294	176	294	170
	...	...	...	...	...
	170	50	176	294	170

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C420	4200	500	71	119	420
	4100	500	73	122	410
	4000	500	75	125	400
	3900	500	77	128	390
	3800	500	79	132	380
	3700	500	81	135	370
	3600	500	83	139	360
	3500	500	86	143	350
	3400	500	88	147	340
	3300	485	88	147	340
	3200	471	88	147	340
	3100	456	88	147	340
	3000	441	88	147	340
	2900	426	88	147	340
	2800	412	88	147	340
	2700	397	88	147	340
	2600	382	88	147	340
	...	...	...	...	...
	340	50	88	147	340

**500W, Isolated Dimming, NFC Programmable LED Driver**

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C990	9900	400	24	40	990
	9600	400	25	42	960
	9300	400	26	43	930
	9000	400	27	44	900
	8700	400	28	46	870
	8400	400	29	48	840
	8100	400	30	49	810
	7800	400	31	51	780
	7500	400	32	53	750
	7200	400	33	56	720
	6900	400	35	58	690
	6600	400	35	58	690
	6300	400	35	58	690
	6000	400	35	58	690
	5700	400	35	58	690
	5400	379	35	58	690
	...	...	...	...	...
	690	48	35	58	690

**■ Revision History**

Revision	Date	Contents
B	2022-03-22	<ol style="list-style-type: none"><li>1. Index page added</li><li>2. Reduced dimming interface sourcing current</li><li>3. DALI 2.0 compatibility added</li><li>4. Programming instruction added</li><li>5. Inrush current data added</li><li>6. Tc point position indication added</li><li>7. Dielectric strength level added</li><li>8. Packaging information added</li><li>9. Mechanical design change with dimming cable color</li><li>10. Revision history added</li></ol>