

## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### Product Datasheet



The global certified TLD-480-C is a dual stage extremely wide input 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
- Fishing



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### 480W, 200-480Vac Input, Isolated Dimming LED Driver

#### ■ Features

- Supply Voltage: 180-528Vac or 250-740Vdc
- 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 1.5W 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
TLD-480-C210-XYZ	180-528Vac	480 W	137-343Vdc	1400mA	2100mA	UL/FCC/ENEC/CCC /CB/RCM/ EAC/CE
TLD-480-C280-XYZ	180-528Vac	480 W	103-229Vdc	2100mA	2800mA	
TLD-480-C420-XYZ	180-528Vac	480 W	69-171Vdc	2800mA	4200mA	
TLD-480-C11A-XYZ	180-528Vac	480 W	26-53Vdc	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

**480W, 200-480Vac Input, Isolated Dimming LED Driver**
**■ Technical Data**

Input Voltage	180-528Vac or 250-740Vdc
Input Frequency	47~63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<15%@60-100%load, refer to THD vs. Load curve
Input Current	2.2 Amax@277Vac & Full-Load, 1.2Amax@480Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	1mA max @480Vac 60Hz, UL8750,0.75mAmax @220Vac 50Hz, IEC61347-1
Input Under Voltage	Shut down and auto-restart
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%Io for programmable model, ±5%Io for non-programmable model
Ripple Current	Ip-p:5%Io 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	$-40^\circ\text{C} \sim +85^\circ\text{C}$ ; 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	1650g
Packing	See Package Information Section in the datasheet

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

**480W, 200-480Vac Input, Isolated Dimming LED Driver**
**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**

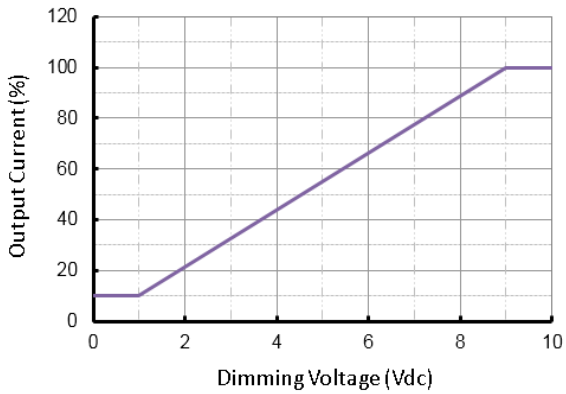
Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
PWM Dimming Range	10% (Duty=10%)	Linear	100% (Duty=90-100%)
Dim off threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Dim on threshold	0.6V or 6%	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

## 480W, 200-480Vac Input, Isolated Dimming LED Driver

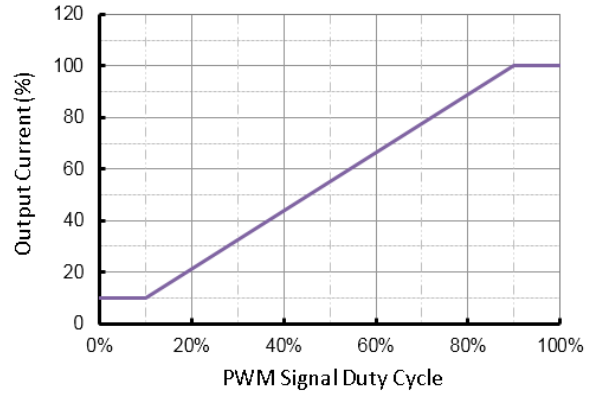
### - Dimming Curve

#### a. Without dim-off

0-10V Dimming Curve

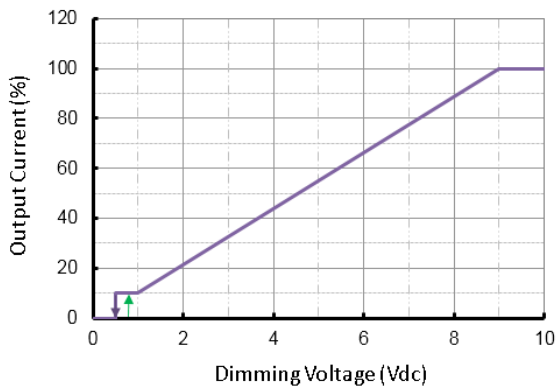


PWM Dimming Curve

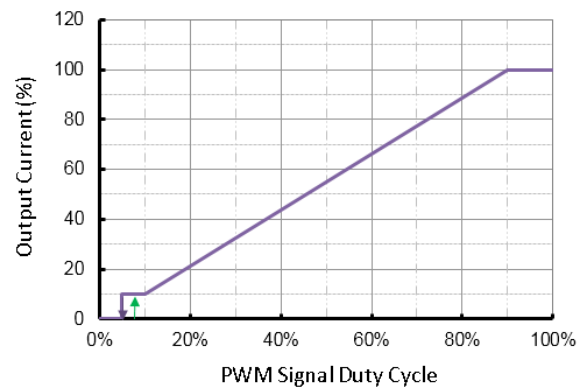


#### b. With dim-off

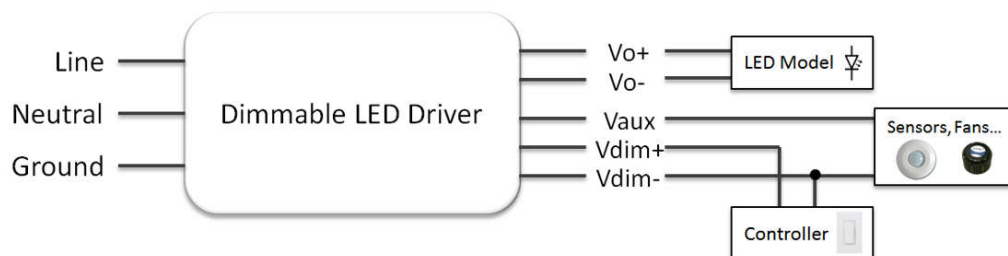
0-10V Dimming Curve



PWM Dimming Curve



### - Dimming Wiring

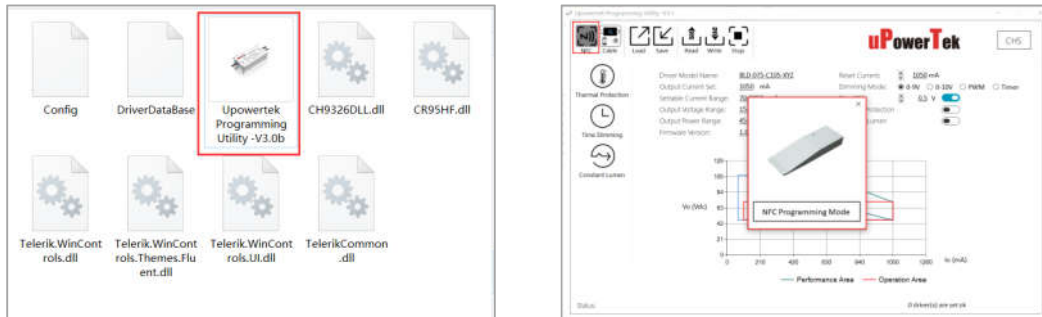


## ■ Programming

### - 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

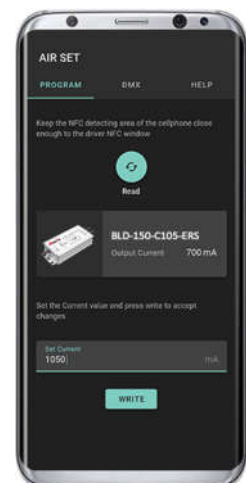
- Download Android APP at <https://www.upowertek.com/download-2/>
- Only available on Android cellphone (iPhone is not supported)
- The cellphone should have NFC function and make sure it is enabled.



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



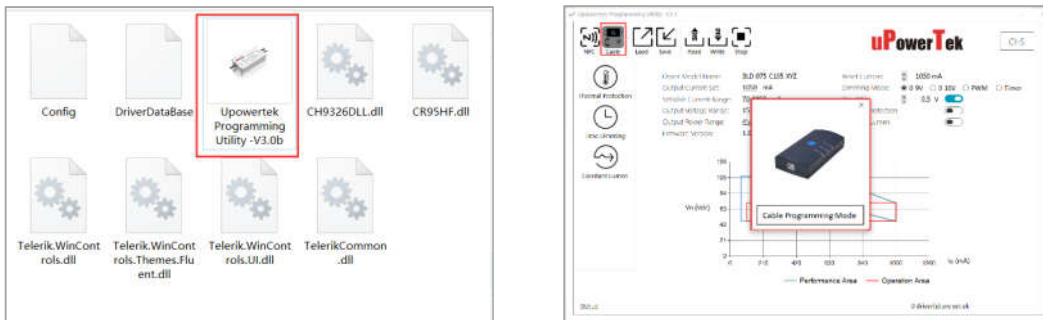
uPowerTek  
Airset



**- Cable Programming**



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

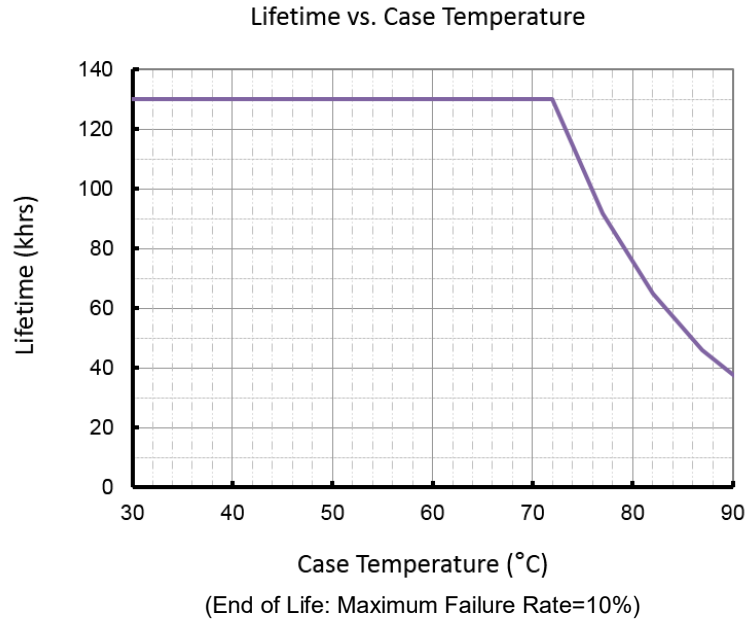


- d. Click “Cable” button if it’s not cable programming mode.
- e. Connect the Vdim+ and Vdim- wires to the right ones (the same color) of the programmer.

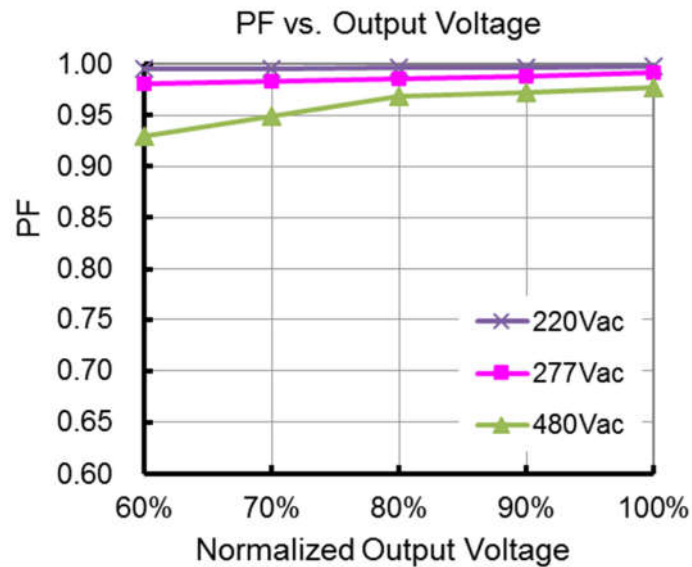
**- Please contact with us for product user manual and more information such as:**

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

## ■ Lifetime vs. Case Temperature

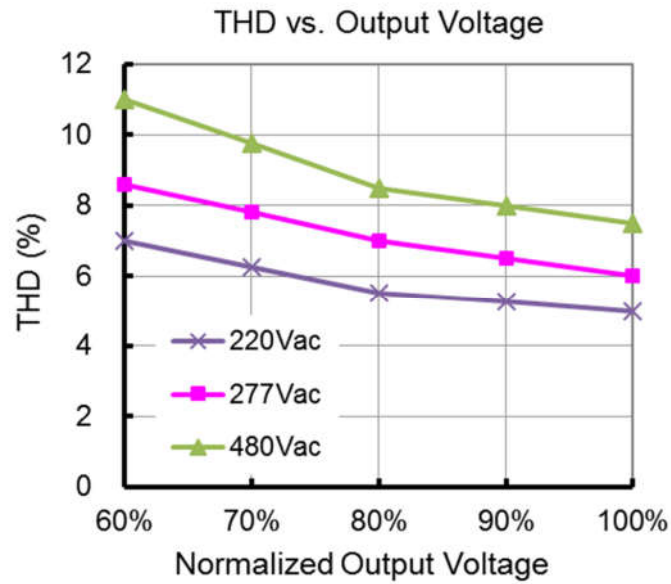


## ■ Power Factor vs. Load

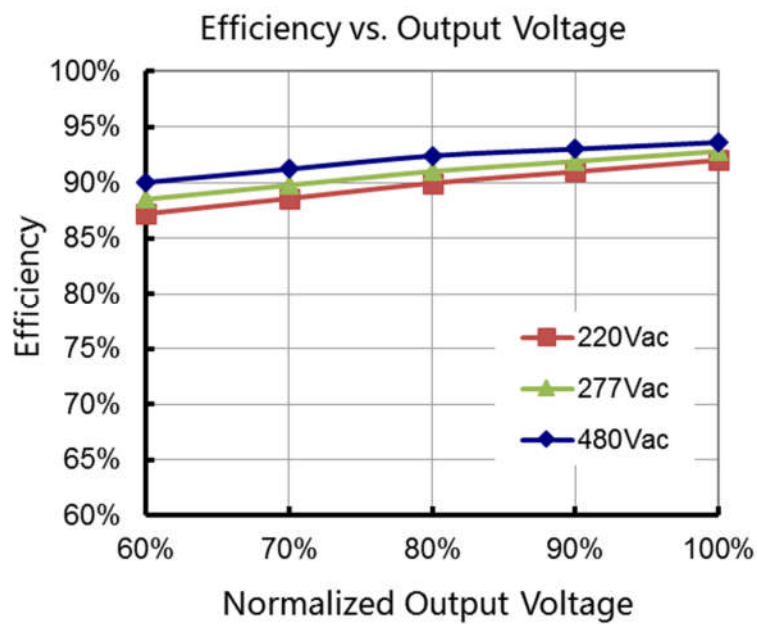




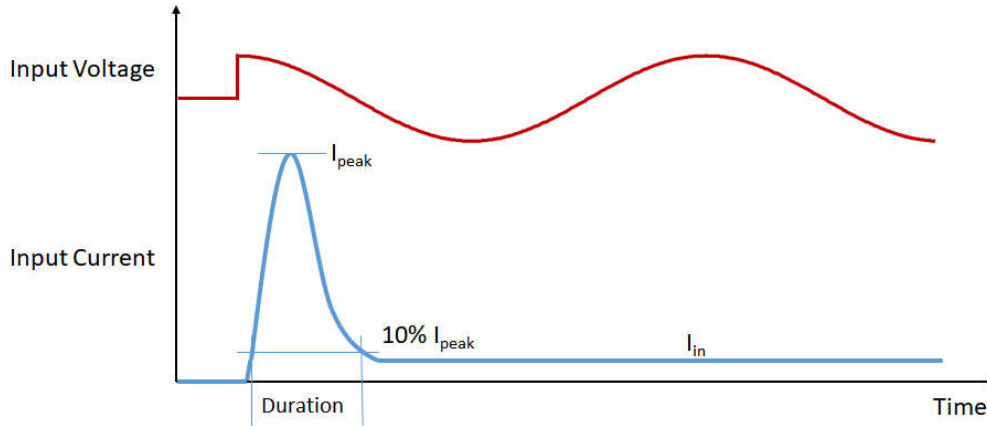
## THD vs. Load



## Efficiency vs. Load (4.2A Model)



## Inrush Current



Input Voltage	$I_{peak}$	Duration
277Vac	87.6A	804us
380Vac	101.2A	680us
480Vac	121.2A	660us

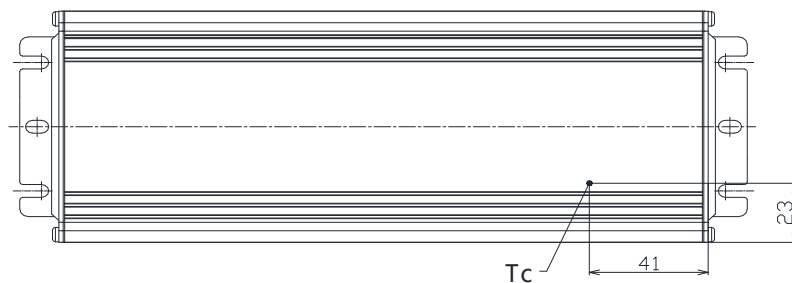
Please contact with us for MCB calculation and waveforms.

## Dielectric Strength

Unit: Vac	Input	Output	Dimming	Case
Input	-	3920	3920	1960
Output	3920	-	1960	1960
Dimming	3920	1960	-	1960
Case	1960	1960	1960	-

## Tc Point

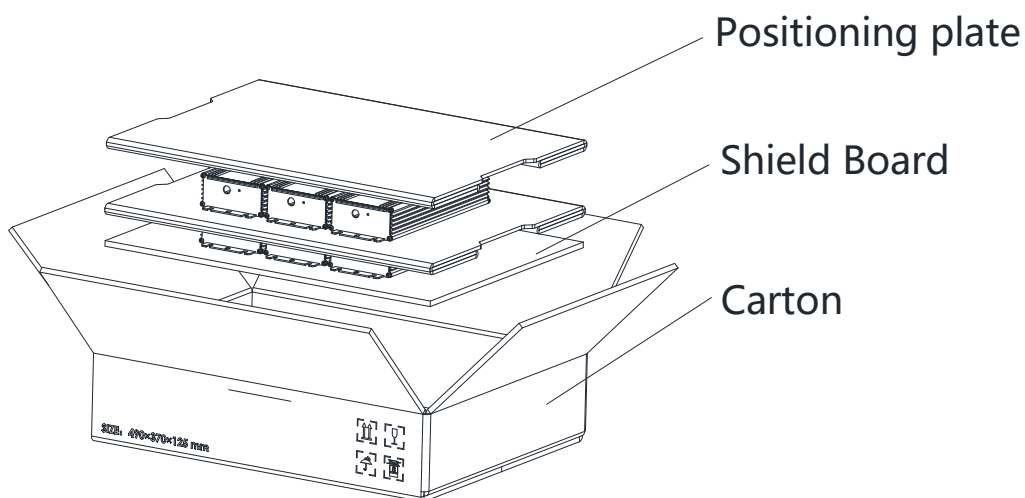
AC INPUT



DC OUTPUT

## ■ Packaging Information

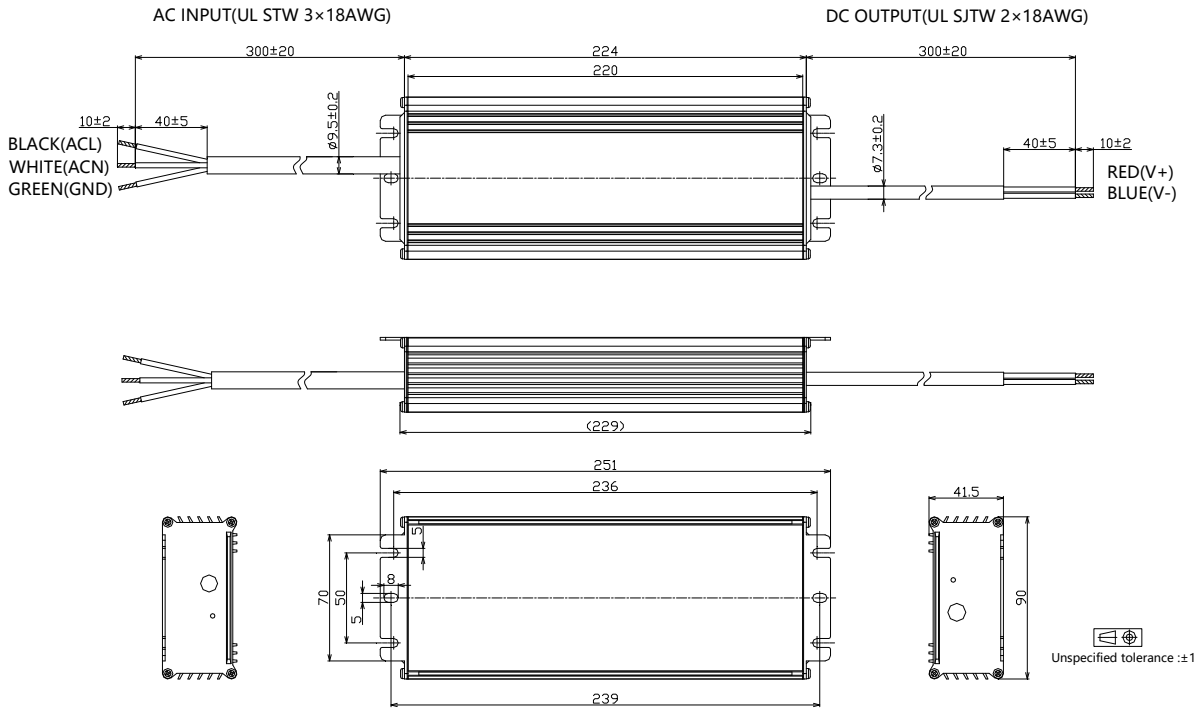
Typical Carton Dimension(L×W×H)	490×370×125 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers	6pcs/carton



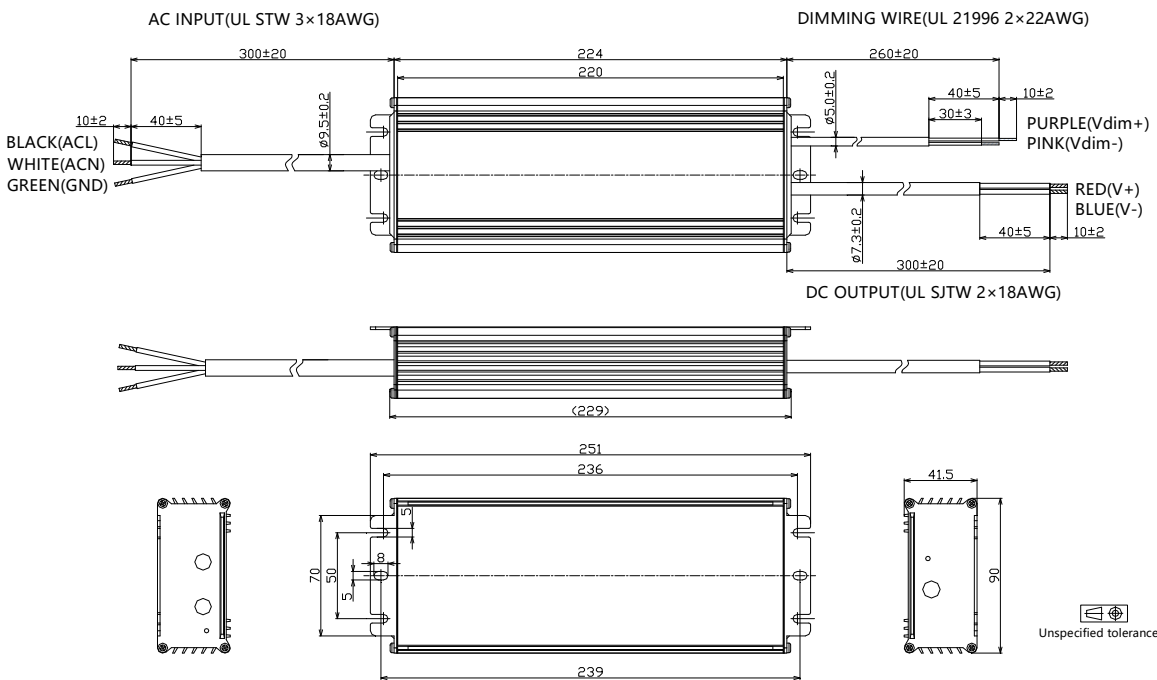
## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### Mechanical Design

#### TLD-480-Cxxx-NN/TRU (UL Cable)

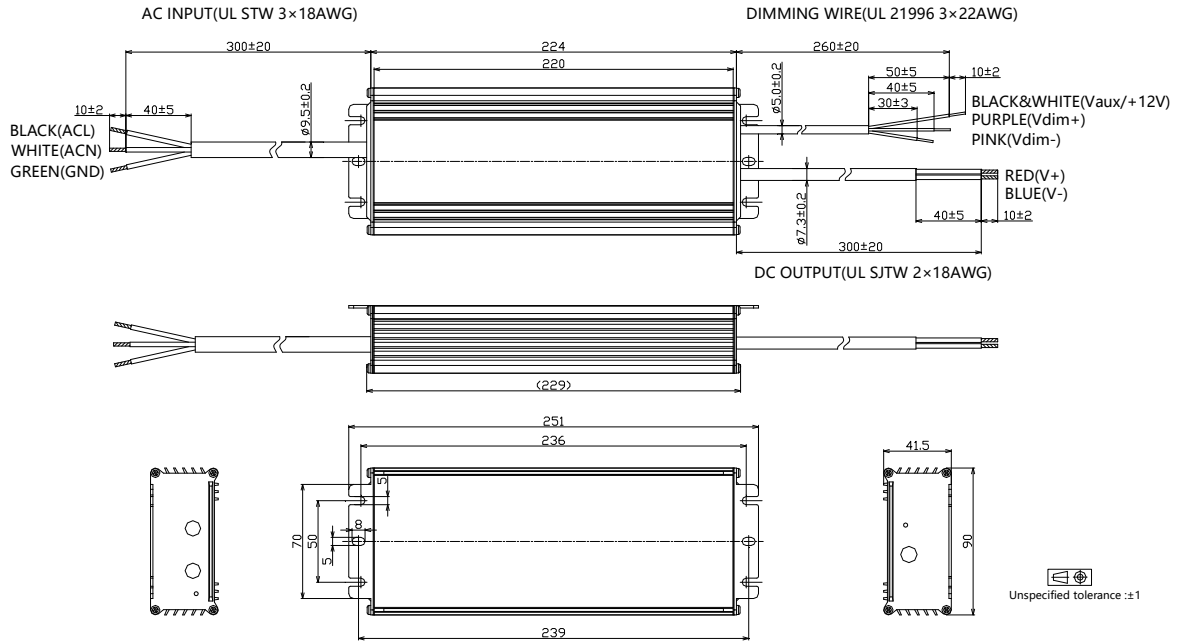


#### TLD-480-Cxxx-DN/DRU (UL Cable)

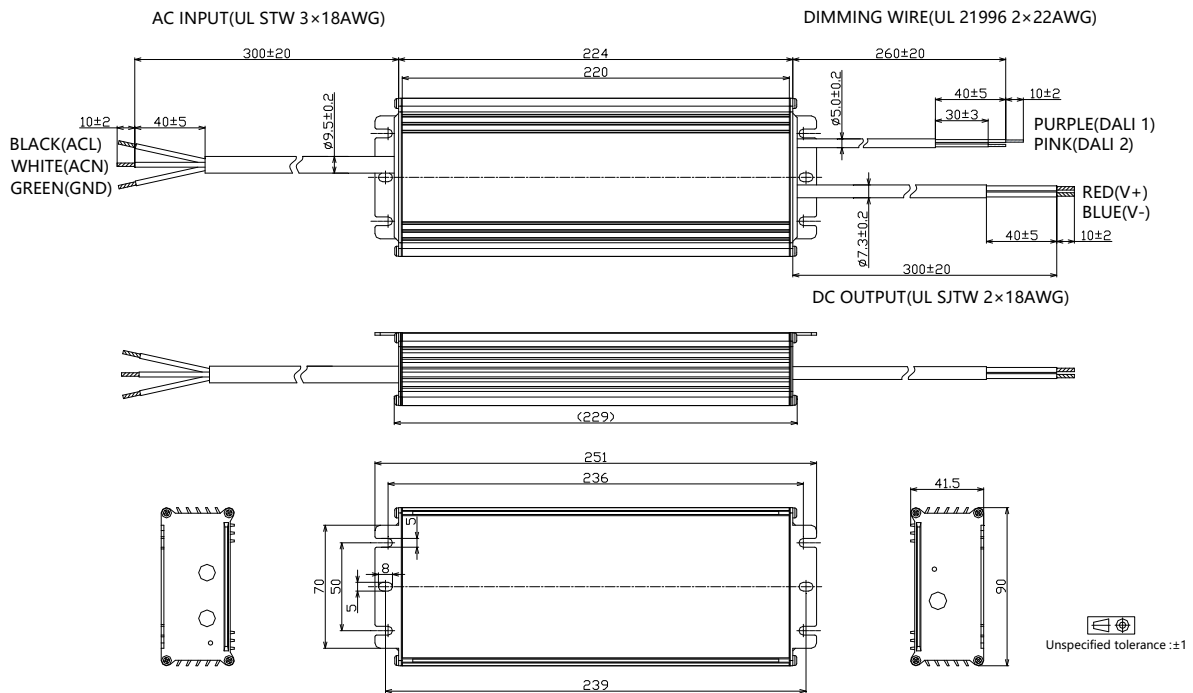


## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### - TLD-480-Cxxx-ERU (UL Cable)

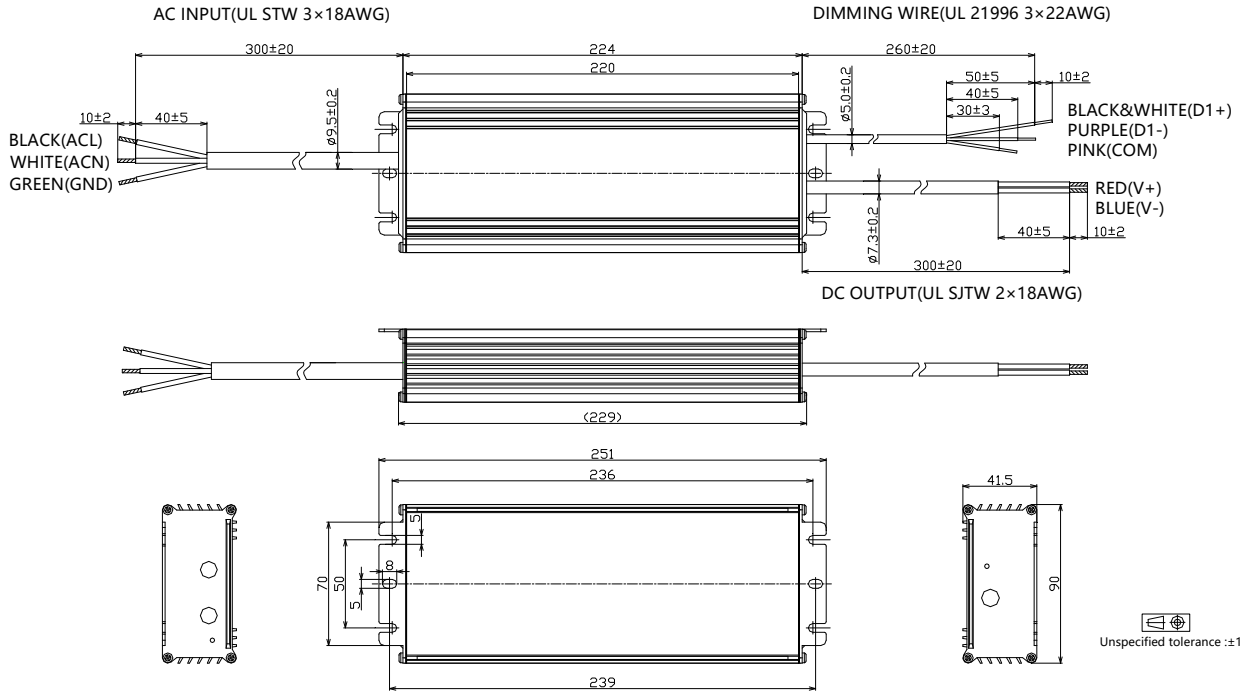


### - TLD-480-Cxxx-ARU (UL Cable)

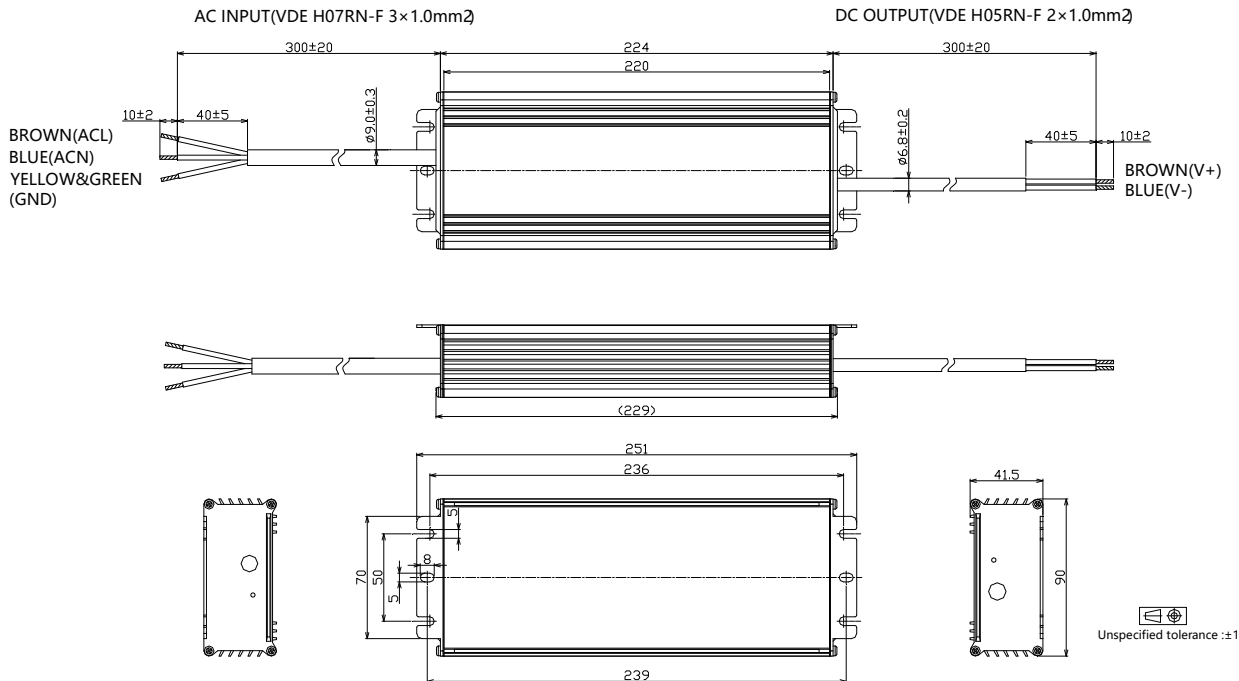


## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### - TLD-480-Cxxx-MRU (UL Cable)

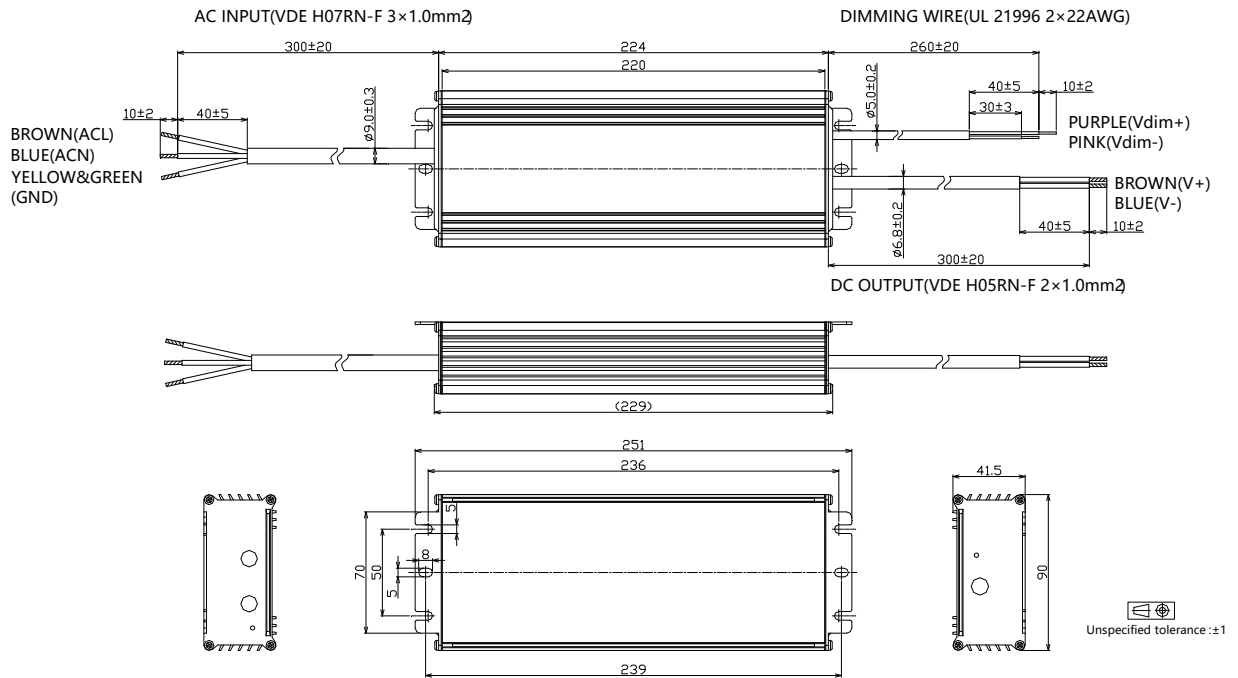


### - TLD-480-Cxxx-NN/TRS (VDE Cable)

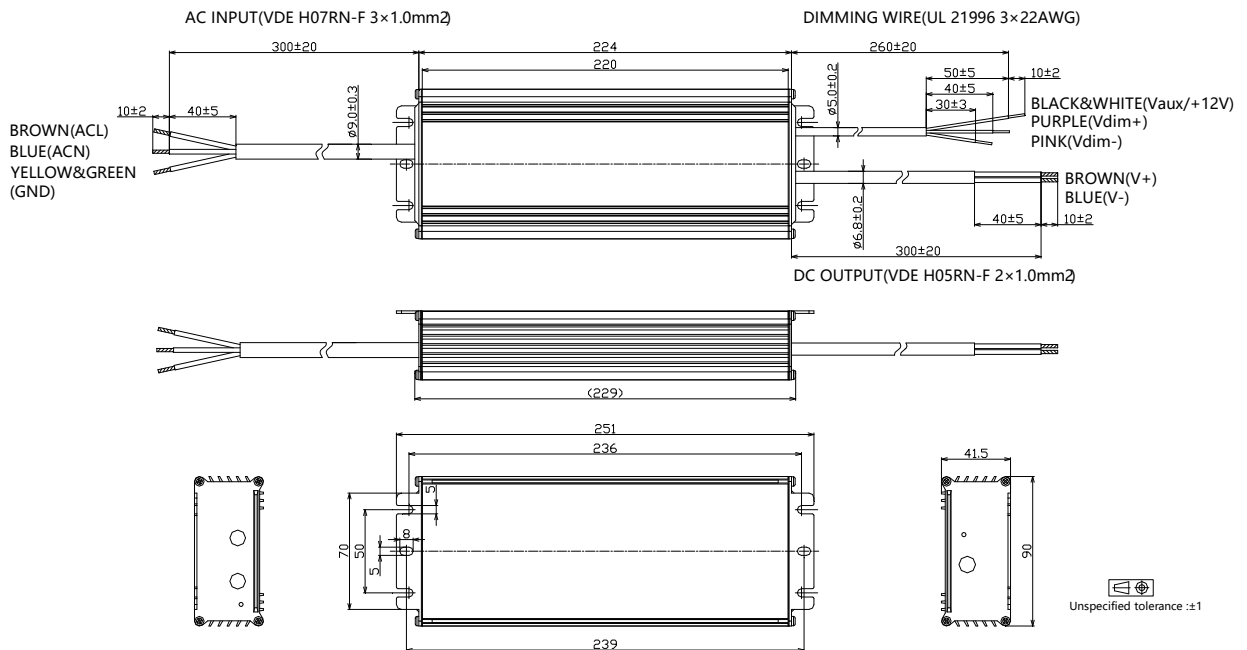


## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### - TLD-480-Cxxx-DN/DRS (VDE Cable)

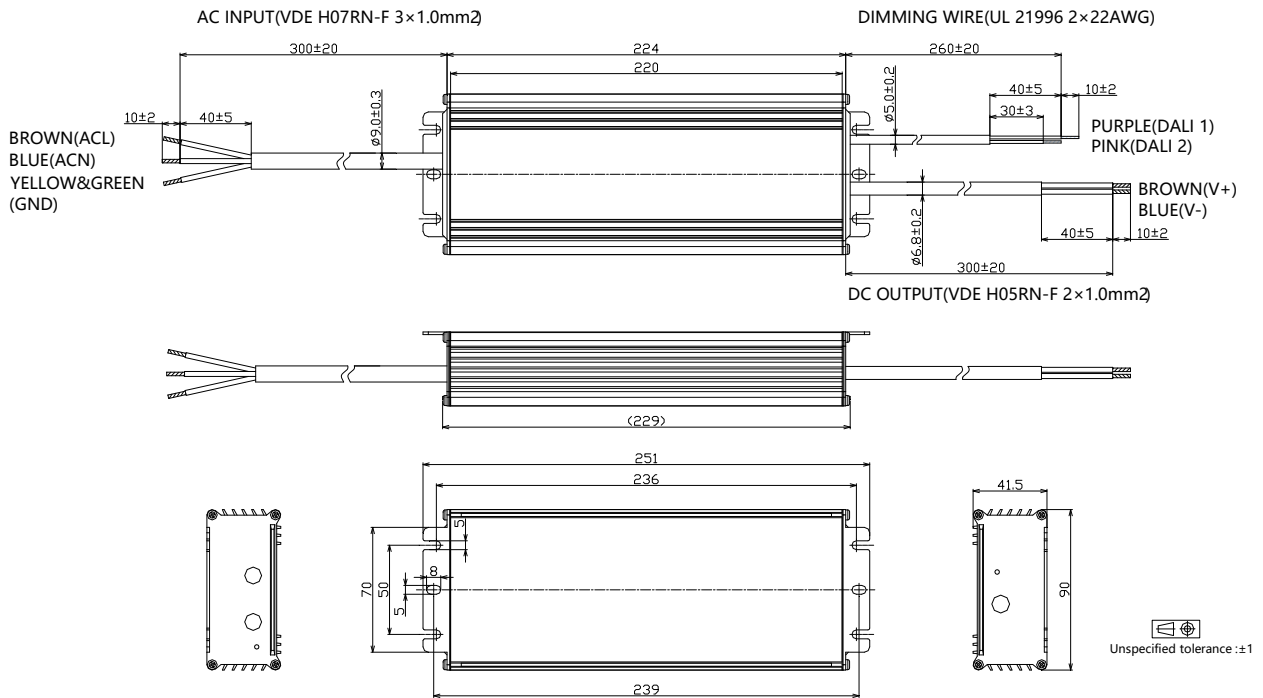


### - TLD-480-Cxxx-EN/ERS (VDE Cable)

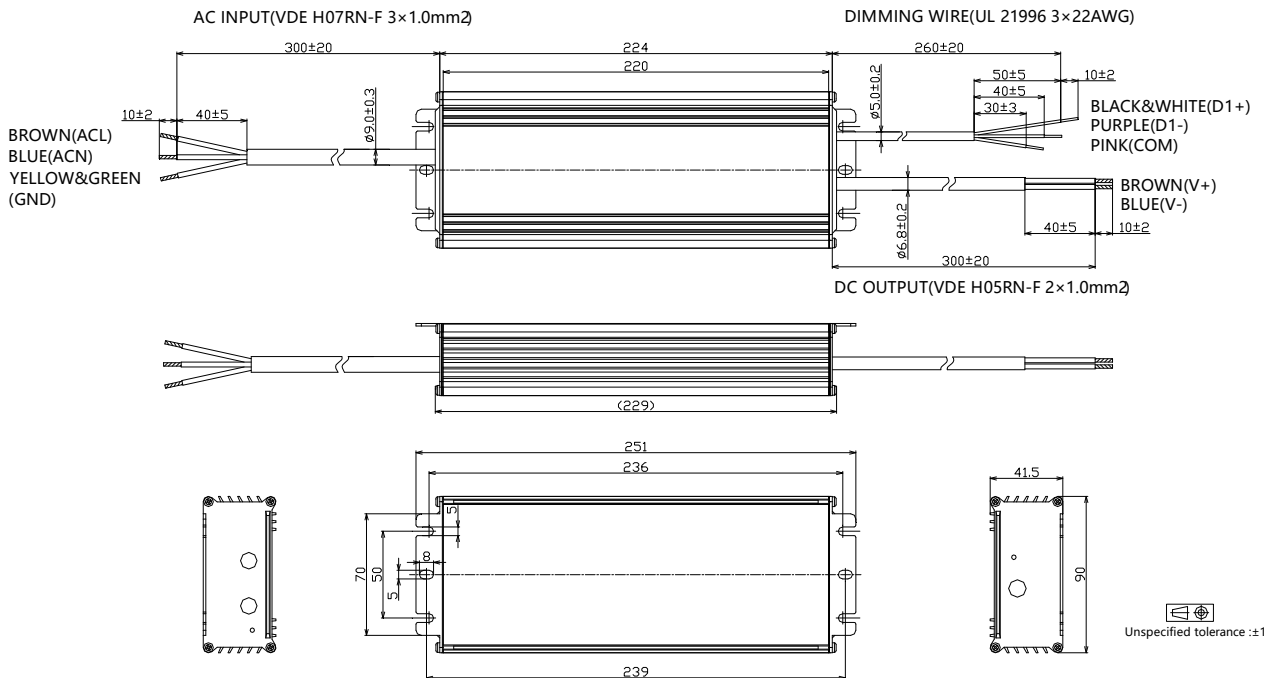


## 480W, 200-480Vac Input, Isolated Dimming LED Driver

### - TLD-480-Cxxx-ARS (VDE Cable)



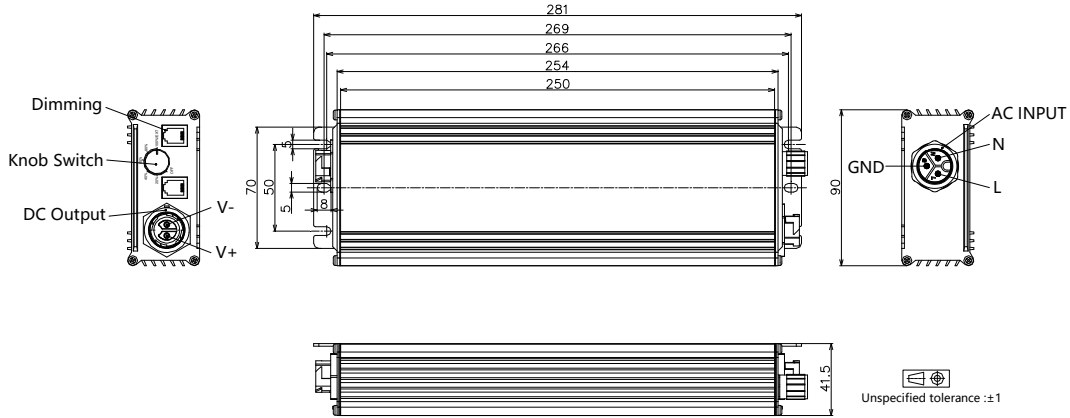
### - TLD-480-Cxxx-MRS (VDE Cable)





## 480W, 200-480Vac Input, Isolated Dimming LED Driver

- Customized Functional End Cap Version

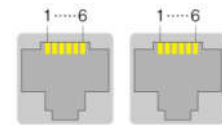


- Add suffix #abcd00 to the end of part number to indicate different configuration. Please refer to product application note AN06 or contact with us for more like **active daisy chain, master mode and button dimming** etc.

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

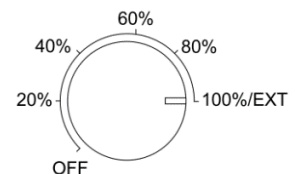
- RJ25 Pin Description (can be customized according to control system)

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	480	137	229	210
	2000	480	144	240	200
	1900	480	152	253	190
	1800	480	160	267	180
	1700	480	169	282	170
	1600	480	180	300	160
	1500	480	192	320	150
	1400	480	206	343	140
	1300	446	206	343	140
	1200	411	206	343	140
	1100	377	206	343	140
	1000	343	206	343	140
	...	...	...	...	...
	140	48	206	343	140

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C280	2800	480	103	171	280
	2700	480	107	178	270
	2600	480	111	185	260
	2500	480	115	192	250
	2400	480	120	200	240
	2300	480	125	209	230
	2200	480	131	218	220
	2100	480	137	229	210
	2000	457	137	229	210
	1900	434	137	229	210
	1800	411	137	229	210
	1700	389	137	229	210
	...	...	...	...	...
	210	48	137	229	210

**480W, 200-480Vac Input, Isolated Dimming LED Driver**

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C420	4200	480	69	114	420
	4100	480	70	117	410
	4000	480	72	120	400
	3900	480	74	123	390
	3800	480	76	126	380
	3700	480	78	130	370
	3600	480	80	133	360
	3500	480	82	137	350
	3400	480	85	141	340
	3300	480	87	145	330
	3200	480	90	150	320
	3100	480	93	155	310
	3000	480	96	160	300
	2900	480	99	166	290
	2800	480	103	171	280
	2700	463	103	171	280
	2600	446	103	171	280
	...	...	...	...	...
	280	48	103	171	280

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C11A	11000	480	26	44	1100
	10500	480	27	46	1050
	10000	480	29	48	1000
	9500	480	30	51	950
	9000	480	32	53	900
	8500	451	32	53	900
	8000	424	32	53	900
	7500	398	32	53	900
	...	...	...	...	...
	900	48	32	53	900

**■ 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>