Product Datasheet

The global certified TLD-1K2-C is an 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. All around protections including digital OTP (internal and external by NTC) with auto-recovery secure 24hour non-stop operation for luminaires.

☑ Stadium ☑ Horticultural ☑ Flood ☑ Harbor ☑ UV ☑ Fishing

Features

- Absolute Supply Voltage: 180-528Vac
- 96% Efficiency Max.
- <1% Low Frequency Ripple
- Fast Dimming and On-off
- Output Cable with Ground Wire
- Low Inrush Current
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Airset™ NFC Programmability
- +/-2% Output Current Accuracy
- Glow-free Dim Off
- 12V 300mA Auxiliary Power to Power Controllers and Fans
- UL Class P, ENEC/CB/RCM
- Safety according to UL8750, EN 61347-1, 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
TLD-1K2-C540-XYZ	180~528Vac	1200 W	133-300Vdc	4A	5.4A
TLD-1K2-C750-XYZ	180~528Vac	1200 W	96-218Vdc	5.5A	7.5A

XY=	Dimming Method	Programmable	Vaux	Dim-off
EN	0-10V/PWM/Time/Resistor	Cable	12V/300mA	√
ER	0-10V/PWM/Time/Resistor	NFC Wireless	12V/300mA	√
AR	DALI2.0	NFC Wireless	-	√
AR-DAX000	D4i	NFC Wireless	24V 150mA	√
MR	RDM + DMX	NFC Wireless	-	√

Z=	U	V	S	W	D
Input Cable	3 pin UL cable with ground	3 pin UL cable with ground	3 pin VDE cable with ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Output Cable	2 pin UL cable without ground	3 pin UL cable with ground	2 pin VDE cable without ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Certified with	UL Listed Class P FCC 200-480Vac	UL Listed Class P FCC 200-480Vac	CE Class I 200-480Vac	CE Class I 200-480Vac	CE Class II 200-480Vac

Technical Data

Input Voltage	180~528Vac
Input Frequency	47～63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<25%@60-100%load, refer to THD vs. Load curve
Input Current	6.5Amax@208Vac & Full-Load， 6Amax@220Vac & Full-Load 4.5Amax@277Vac & Full-Load, 2.7Amax@480Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	0.75MIU max @480Vac 60Hz, UL8750 0.7mA max @400Vac 50/60Hz, IEC60598-1
Input Under Voltage	Shut down and auto-restart
Surge Protection	Line to line 10kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%Io
Ripple Current	Ipk-pk: low frequency (<=3kHz) 1%Io typ., 2%Io max. high frequency (>3kHz) 5%Io typ., 10%Io max.
TLA (Temporal Light Artifacts)	PstLM<0.02, SVM<0.05, IEC-61547-1
Percent Flicker	1% max. Broadcasting level, GB/T-38539-2020
Setup Time	1.5s max
Overshoot	10% Io max & LED Load
Output Over Voltage	110% Vomax, typ.
Short Circuit	Auto recovery. The output recovers when short is removed.
Over Temperature	Lower the output current when Tc≧105±10℃; Auto Recovery When Tc ≦70±10℃
Auxiliary Power (Vaux)	12V+/-5%, 300mA max (Non-D4i models), see Dimming Section for D4i
Operating Temperature	Case Temperature Tc=-40℃~+90℃ ； 10%RH～100%RH
Storage Temperature	-40℃～+85℃； 5%RH～100%RH
MTBF	≥320,000 hours, 75℃ case temperature (MIL-HDBK-217F)
Lifetime	≥100,000 hours, 75℃ case temperature, refer to life vs. Tc curve
Case Temperature	90℃ max, marked in the Tc point of label
Dimension	287 x 125 x 49 by mm (body), 312 x 125 x 49 by mm (endcaps included)
Net Weight	3250g
Packing	See Package Information Section in the datasheet

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

Safety/EMC Compliance

Safety Standards	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
IEC 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
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
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

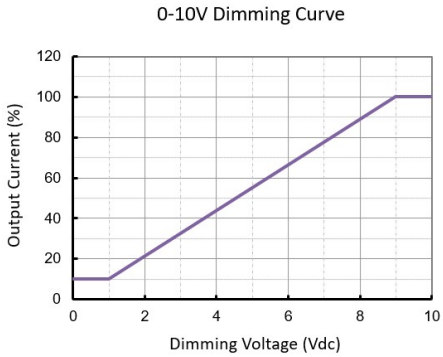
Dimming

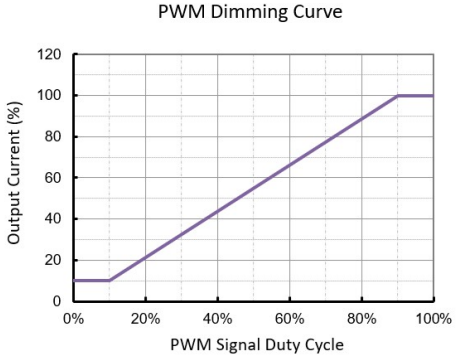
Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
PWM Dimming Range	10% (Duty=10%)	Linear	100% (Duty=90-100%)
Default Dim off Threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Default Dim off Threshold	0.6V or 6%	0.7V or 7%	0.8V or 8%
PWM High	3.8V		9V
PWM Low	0V		0.6V
PWM Frequency	300Hz		2kHz
DALI Interface Standard	IEC62386-101,102,150,207,250,251,252,253		
Dimming Range	10%	Logarithmic (default)	100%
DA1,DA2 High Level	9.5V	16V	22.5V
DA1,DA2 Low Level	-6.5V	0	6.5V
DA1,DA2 Current	0		2mA
Bus Power Supply Voltage	12Vdc	16Vdc	20Vdc
Bus Power Supply Current	52mA	-	60mA
D4i Model Auxiliary Power Voltage	21.6V	24V	26.4V
D4i Model Auxiliary Power	3W	-	4W

Auxiliary Power Endurance @6W	3.8ms/6ms	-	4.5ms/6ms
Auxiliary Power Endurance @10W	1.8ms/6ms	-	2.2ms/6ms
Bus Power Supply Current	52mA	-	60mA
DMX+ & DMX- Voltage	-6V		6V
DMX to Ground Resistance	25Mohm		
Logic 0/1 (DMX+ to DMX-) Threshold		0.2V	
Communication Baud Rate		250kbps	
Fast Dimming On-Off Transition		300ms	
Fast Dimming 10-100% Io Transition		70ms	

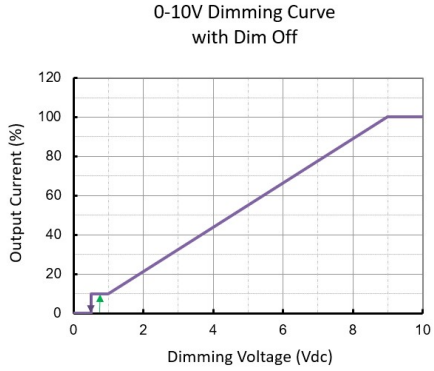
- **Default Dimming Curves**

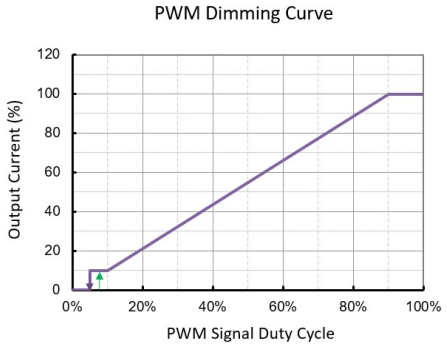
a. 0-10V dimming without dim-off



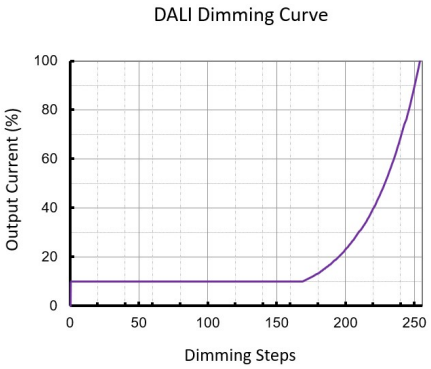


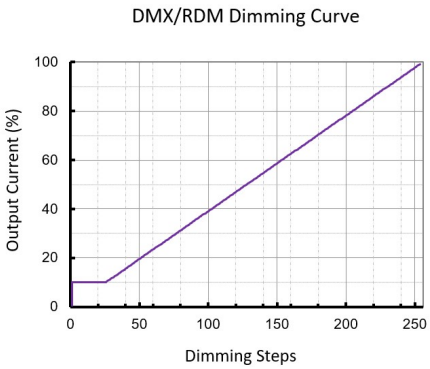
b. 0-10V dimming with dim-off





c. DALI and DMX dimming curves



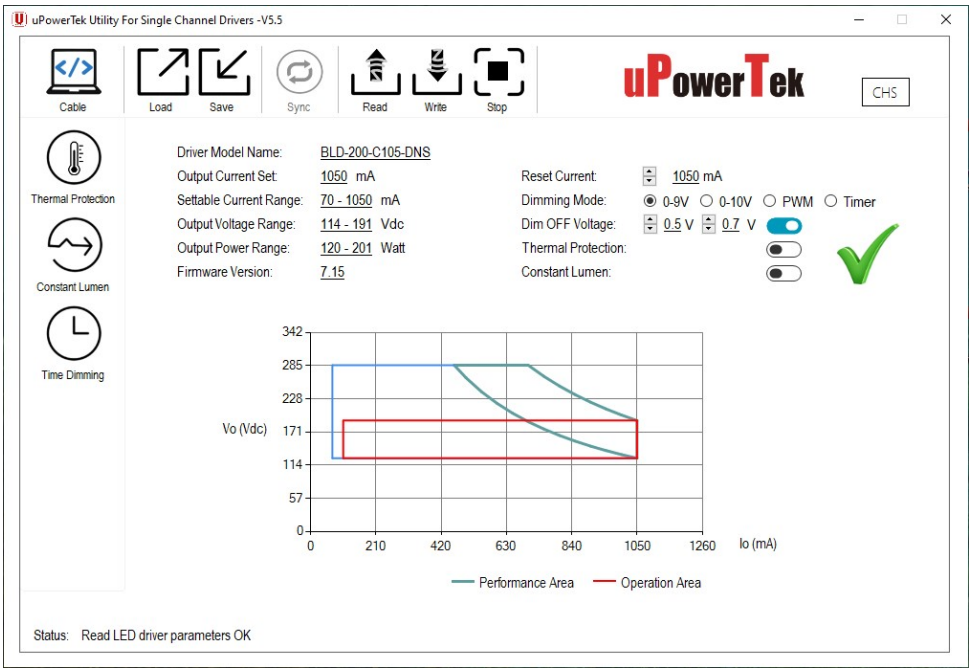


Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

Programming

- **Programmable Functions**

  uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current, Dimming Mode, Dim Off/On Voltage Threshold, and Timer Dimming can be set as basic programming functions. Constant Lumen Output (CLO) can also be customized to ensure consistent light performance. Additionally, depending on the different product model numbers, users can benefit from programming Thermal Protection by external NTC (with extra cable), DALI/D4i Features, and DMX addressing.



uPowreTek Programming Software Interface

- **Required Equipment**

  To program uPowerTek LED drivers, users will need specific equipment based on their preferred method. For wired programming, the uPowerTek Cable Programmer is essential. For NFC wireless programming, users can use a smartphone with either IOS or Android, the uPowerTek NFC Programmer, or the FEIG NFC Programmers. These tools ensure a seamless and efficient setup process, realizing precise customization of the LED driver settings.

Cable Programmer

NFC Programmer V1

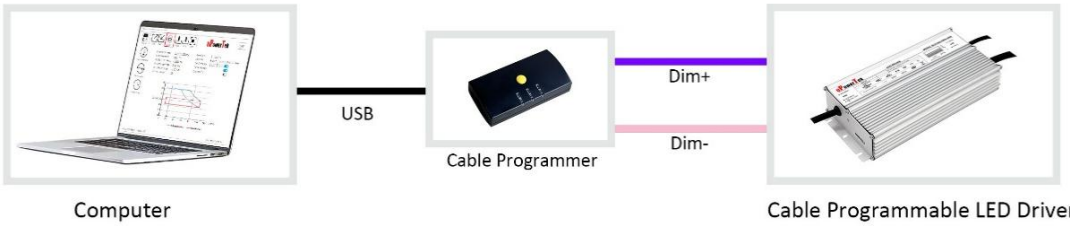
NFC Programmer V2

FEIG NFC Programmer

Android or iPhone

- **Connection Guide**

  This guide provides simple connection diagrams to help users understand the programming system. For more detailed operating instructions, including step-by-step procedures and additional configurations, please visit our website. You can download the comprehensive user manual and necessary software from the following link: https://www.upowertek.com/download-2/.

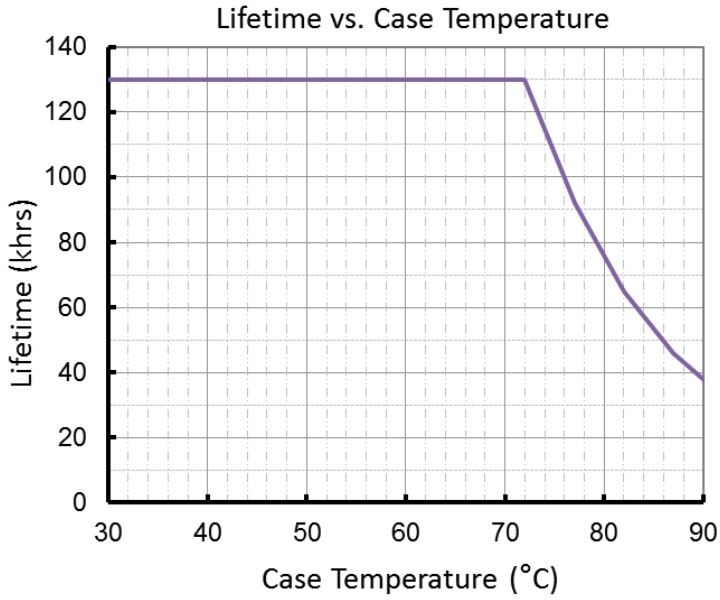


Wired Programming

Wireless Programming

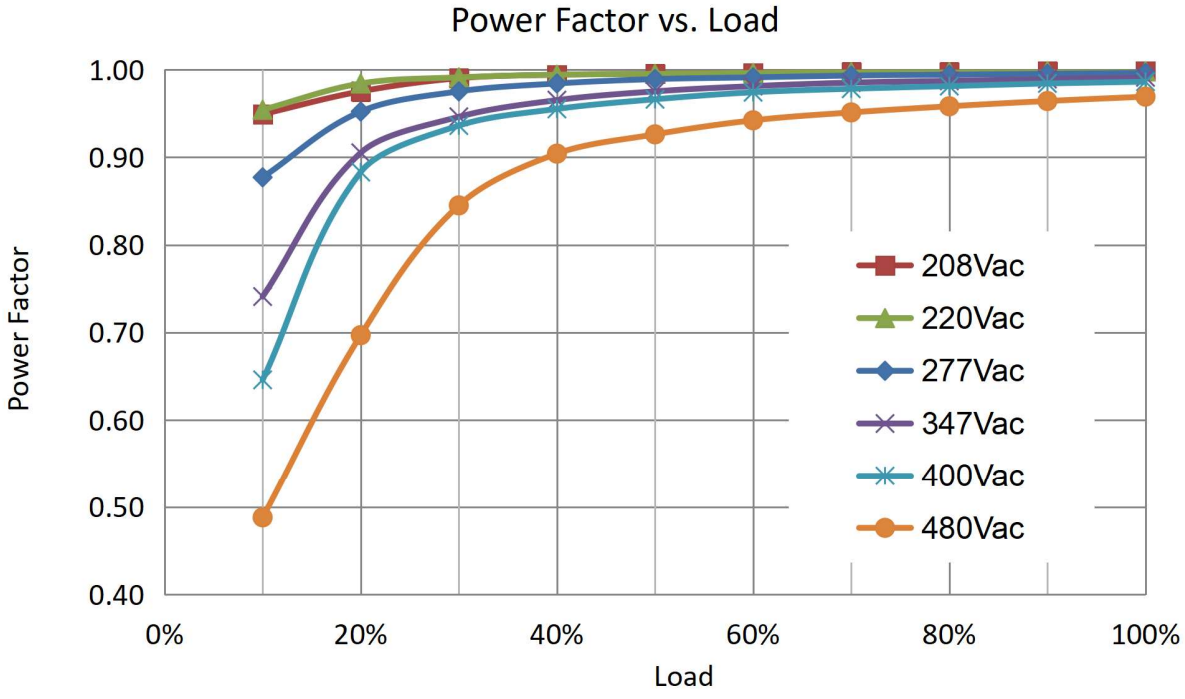
Cellphone Programming

Lifetime vs. Case Temperature

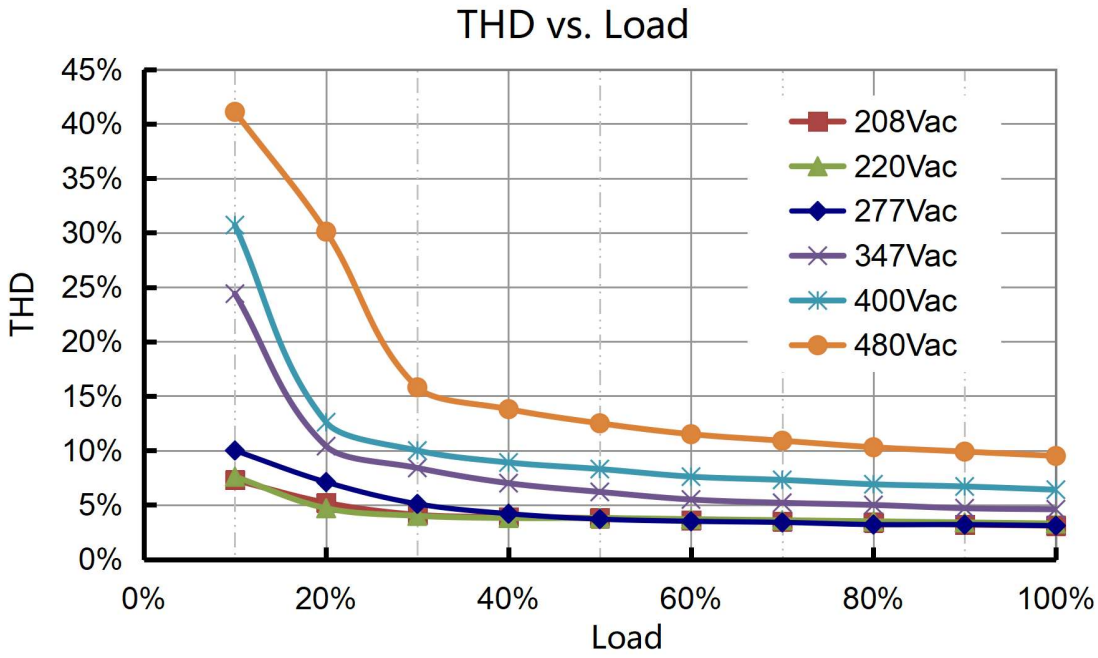


(End of Life: Maximum Failure Rate=10%)

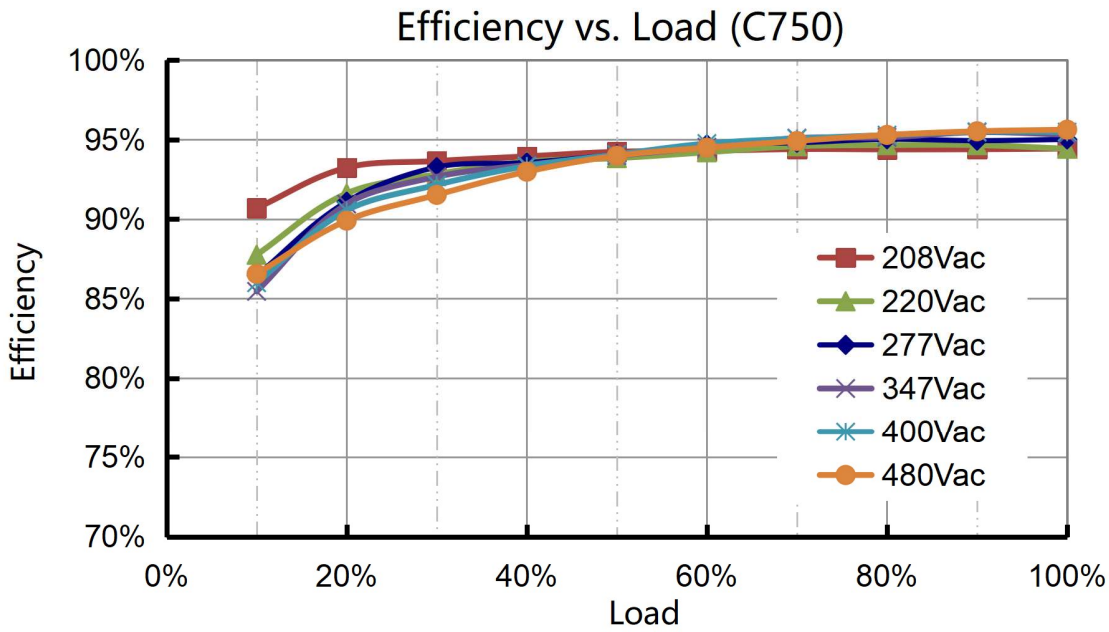
Power Factor vs. Load



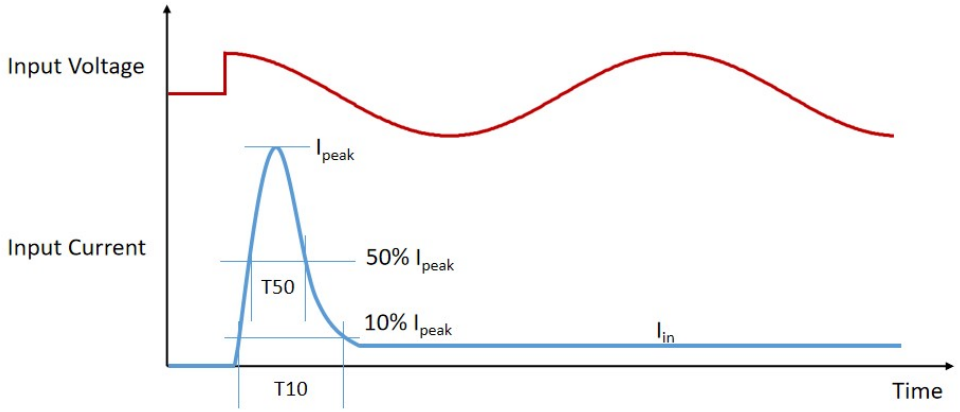
THD vs. Load



Efficiency vs. Load



Inrush Current

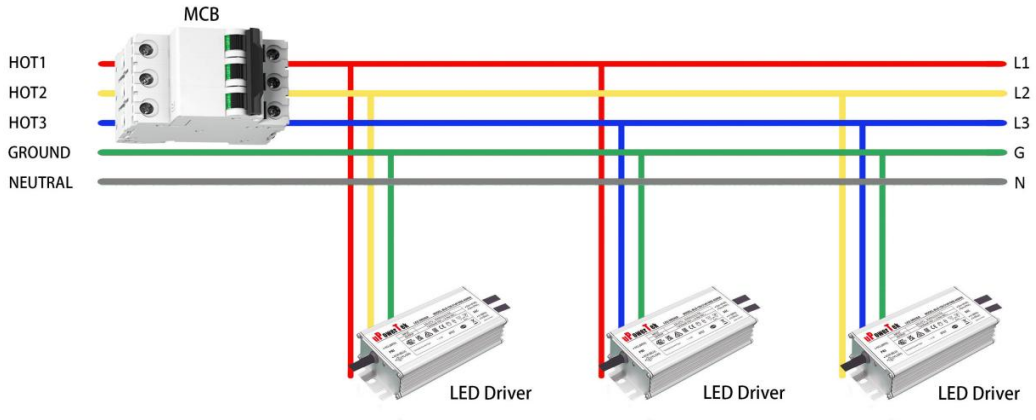


Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
220Vac	5.9A	18.6mS	7.5ms
277Vac	7.5A	19.2mS	8.1ms
400Vac	10.7A	18.9mS	8.0ms
480Vac	12.8A	17.6mS	7.1ms

- **MCB Suggestion**

Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
220Vac	1	1	2	3	1	1	3	3	1	2	3	4
277Vac	1	2	3	4	1	2	3	4	1	2	4	5
400Vac	1(x3)	1(x3)	2(x3)	3(x3)	1(x3)	1(x3)	3(x3)	3(x3)	1(x3)	2(x3)	3(x3)	4(x3)
480Vac	1(x3)	2(x3)	3(x3)	4(x3)	1(x3)	2(x3)	3(x3)	4(x3)	1(x3)	2(x3)	4(x3)	5(x3)

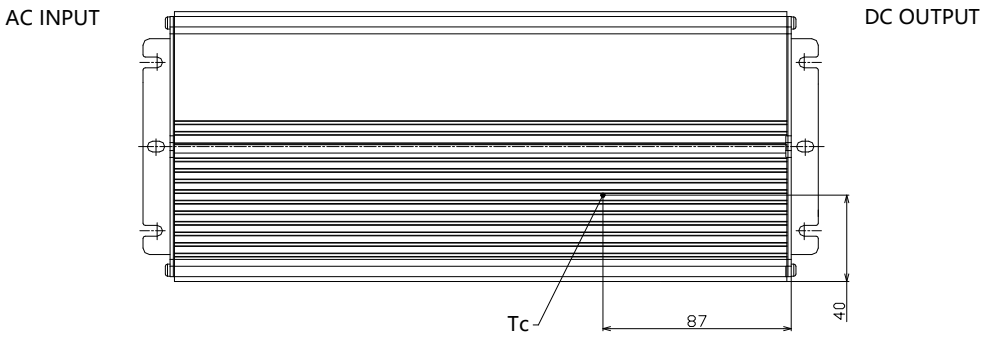
Three phase wiring suggestion.



Dielectric Strength

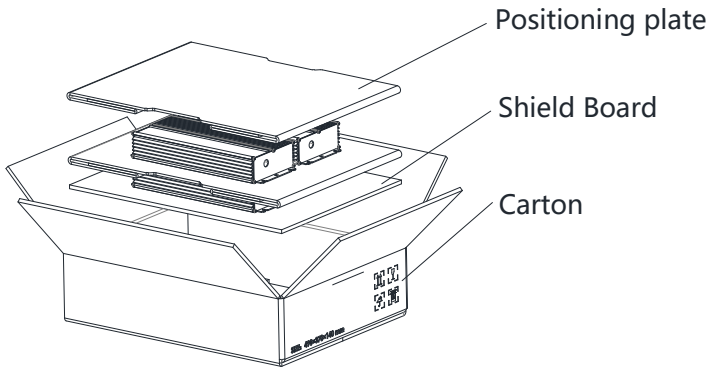
Unit: Vac	Input	Output	Dimming	Case
Input	-	3920	3920	1960
Output	3920	-	1960	1960
Dimming	3920	1960	-	1960
Case	1960	1960	1960	-

Tc Point



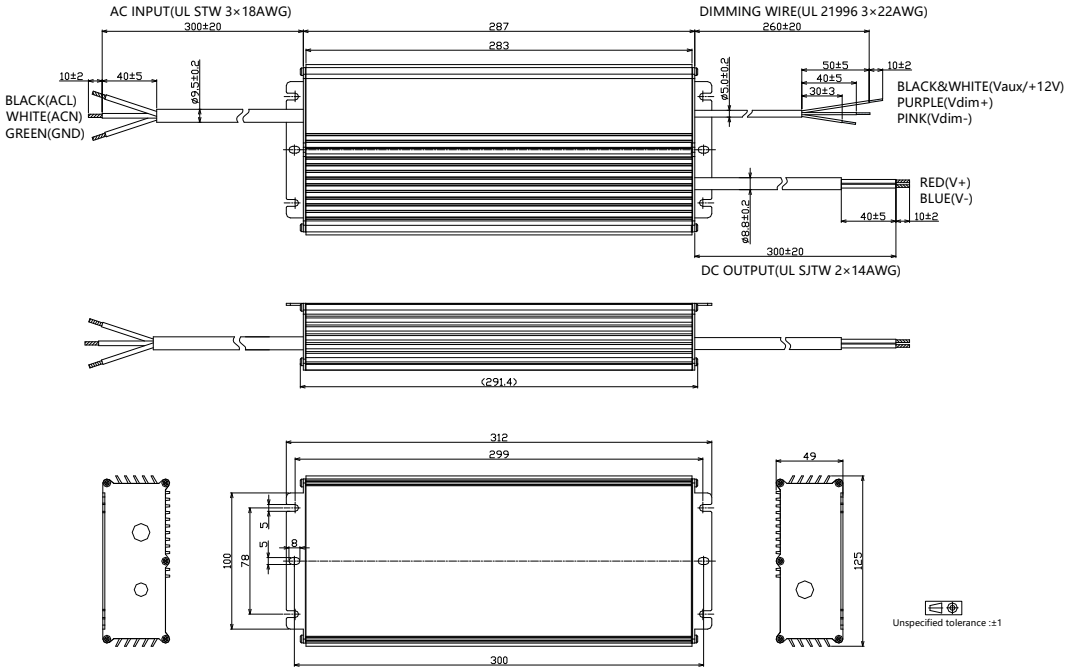
Packaging Information

Typical Carton Dimension(L×W×H)	490×370×140 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	4pcs/carton
Net Weight	13.0 kg/carton
Gross Weight	13.9 kg/carton

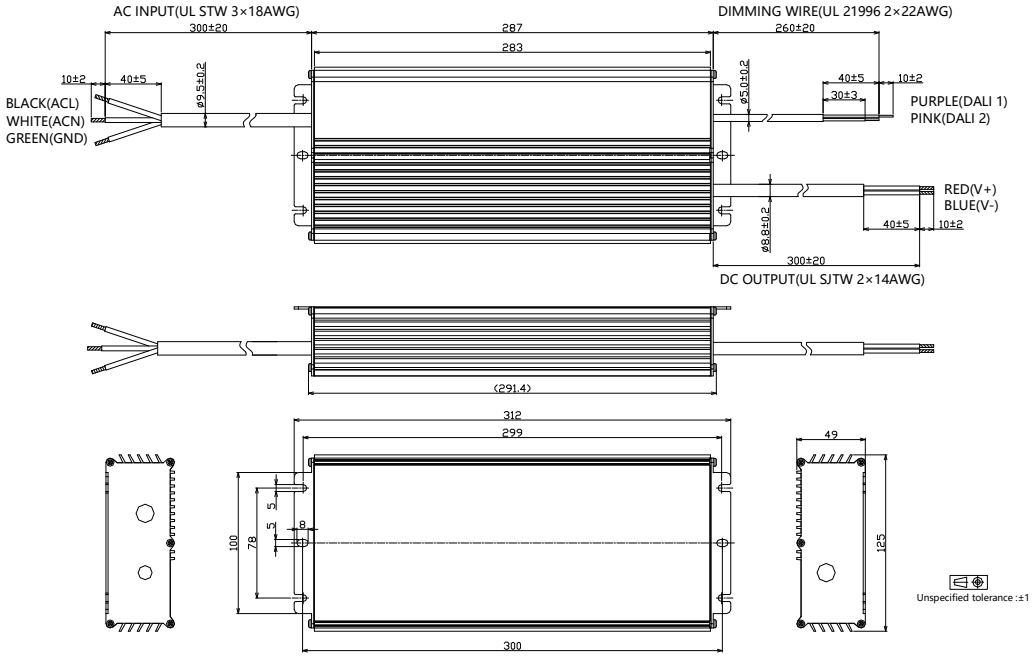


Mechanical Design

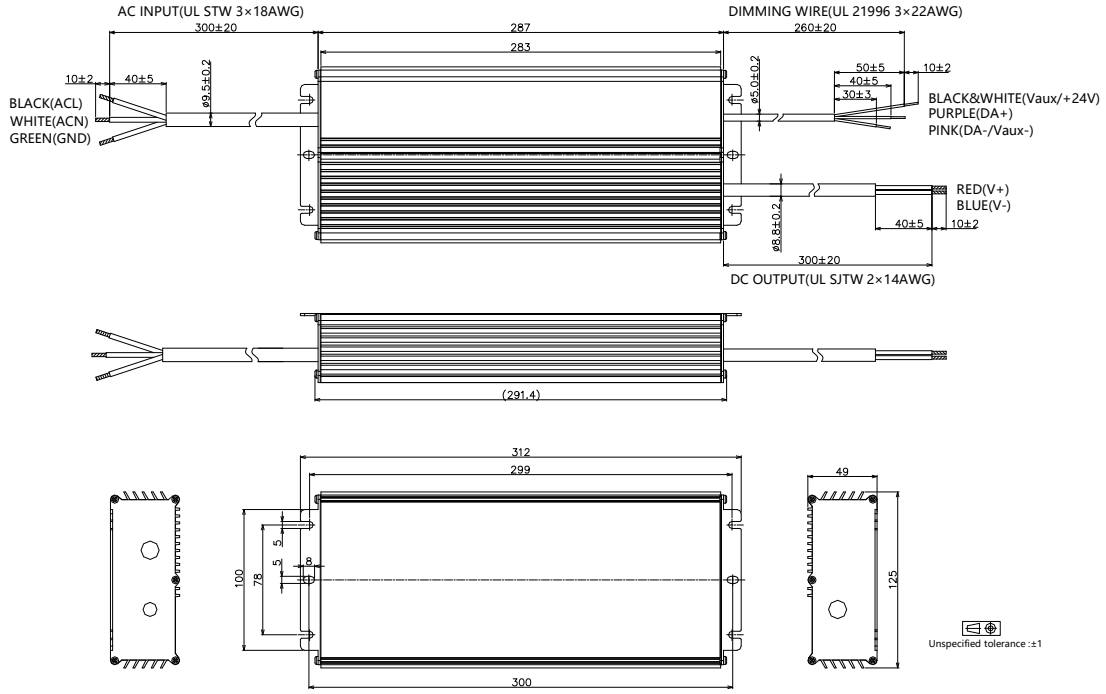
- **TLD-1K2-Cxxx-EN/ERU (UL Cable)**



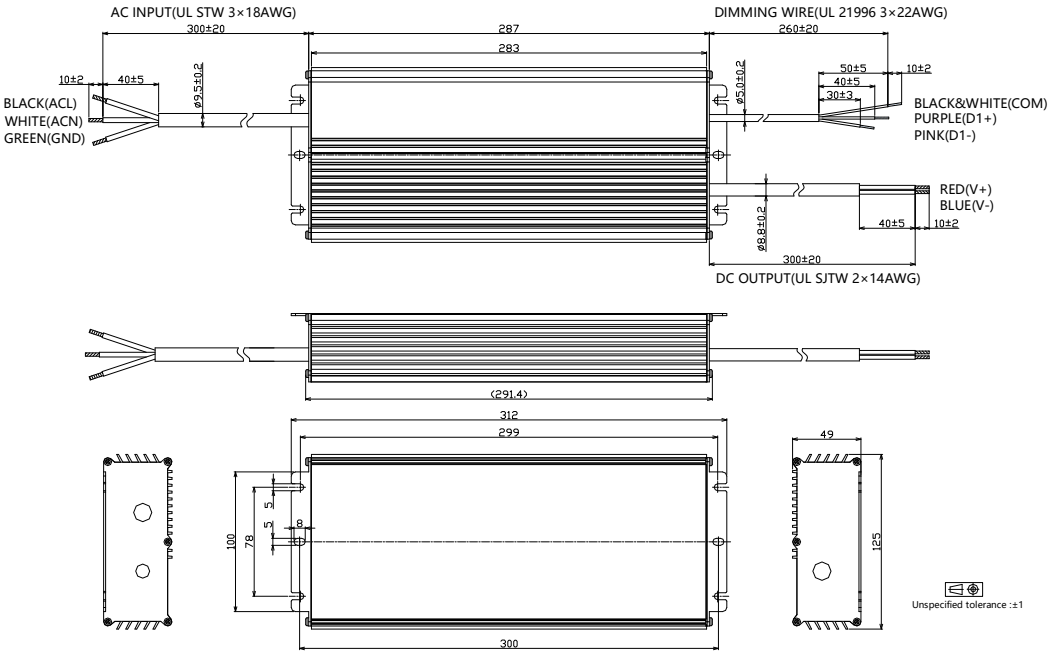
- **TLD-1K2-Cxxx-ARU (UL Cable)**



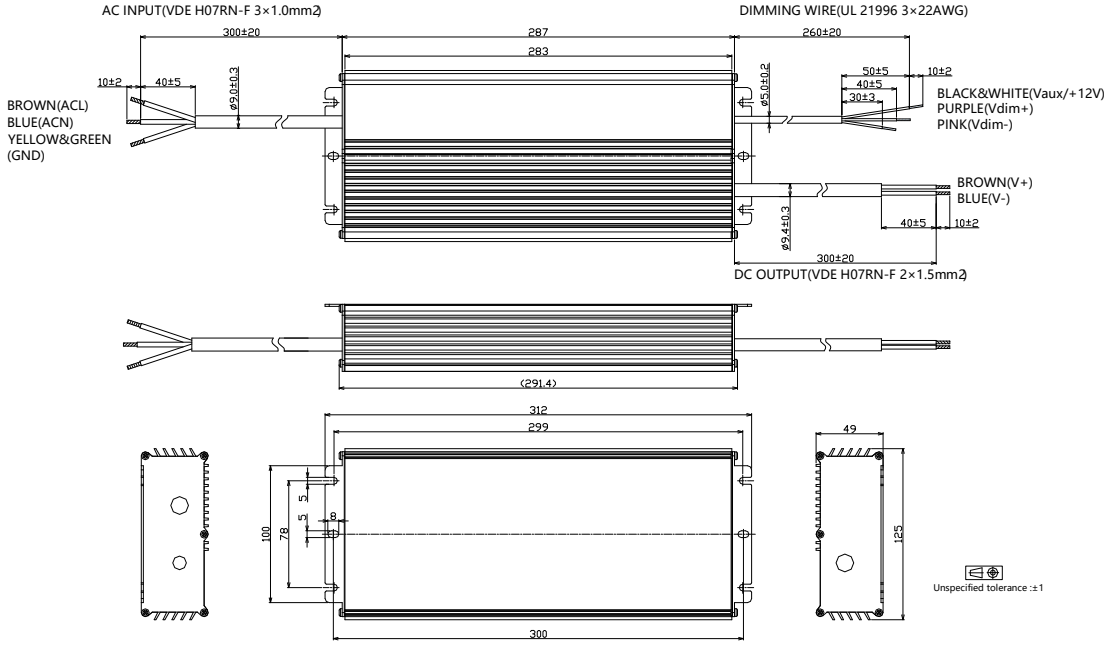
- **TLD-1K2-Cxxx-ARU-DAX000 D4i Version (UL Cable)**



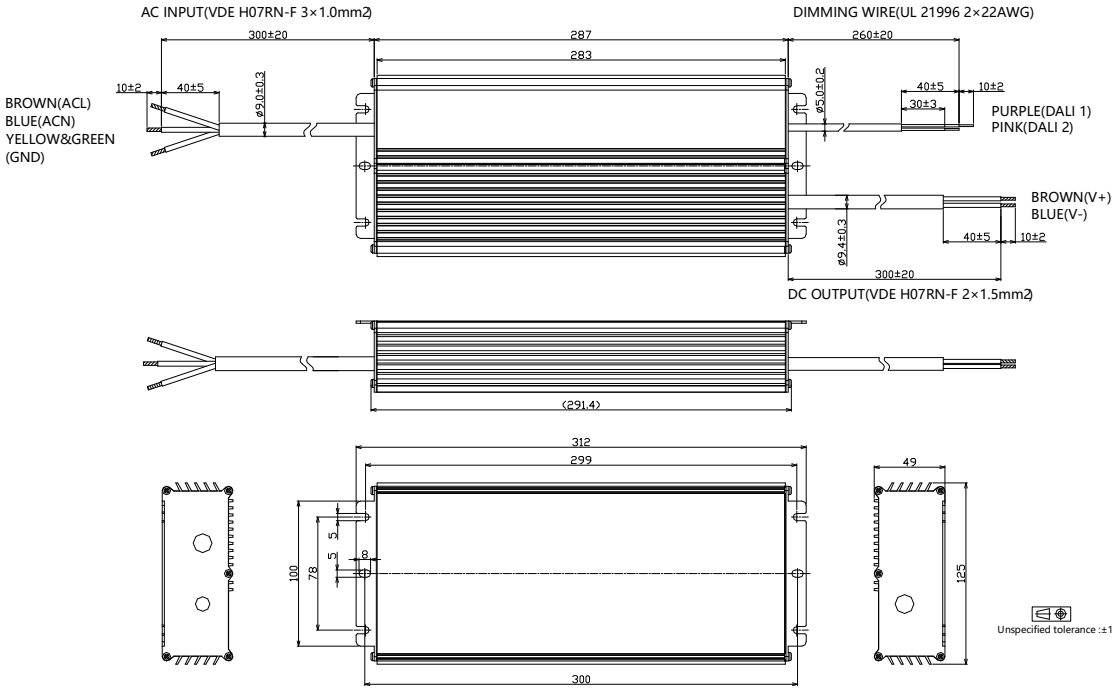
- **TLD-1K2-Cxxx-MRU (UL Cable)**



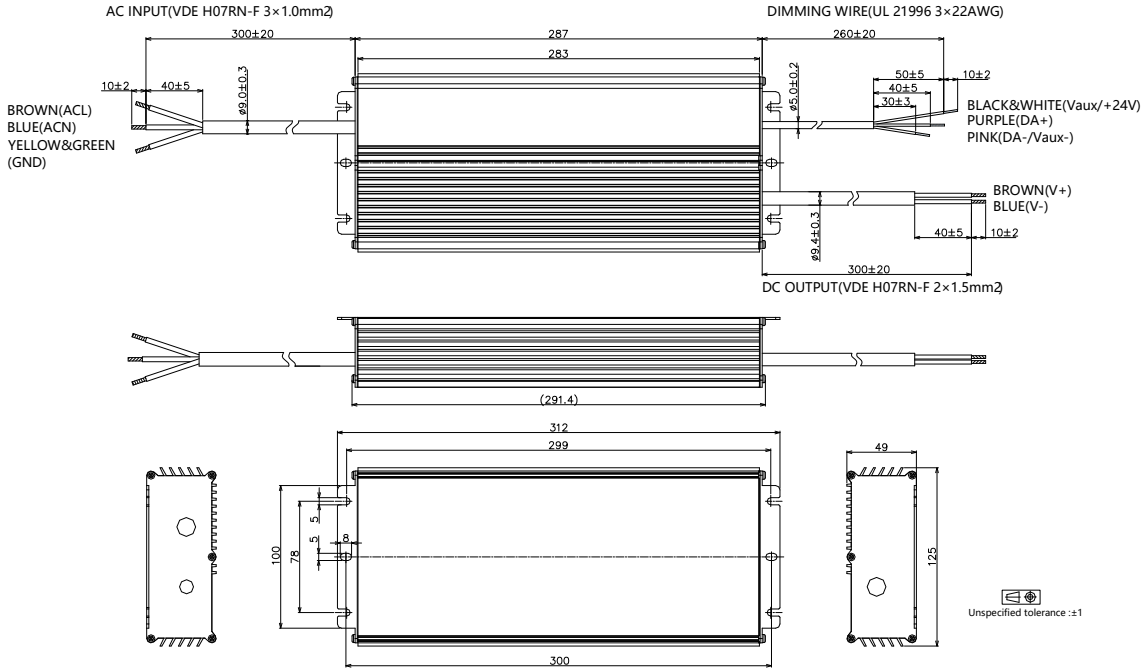
- **TLD-1K2-Cxxx-EN/ERS (VDE Cable)**



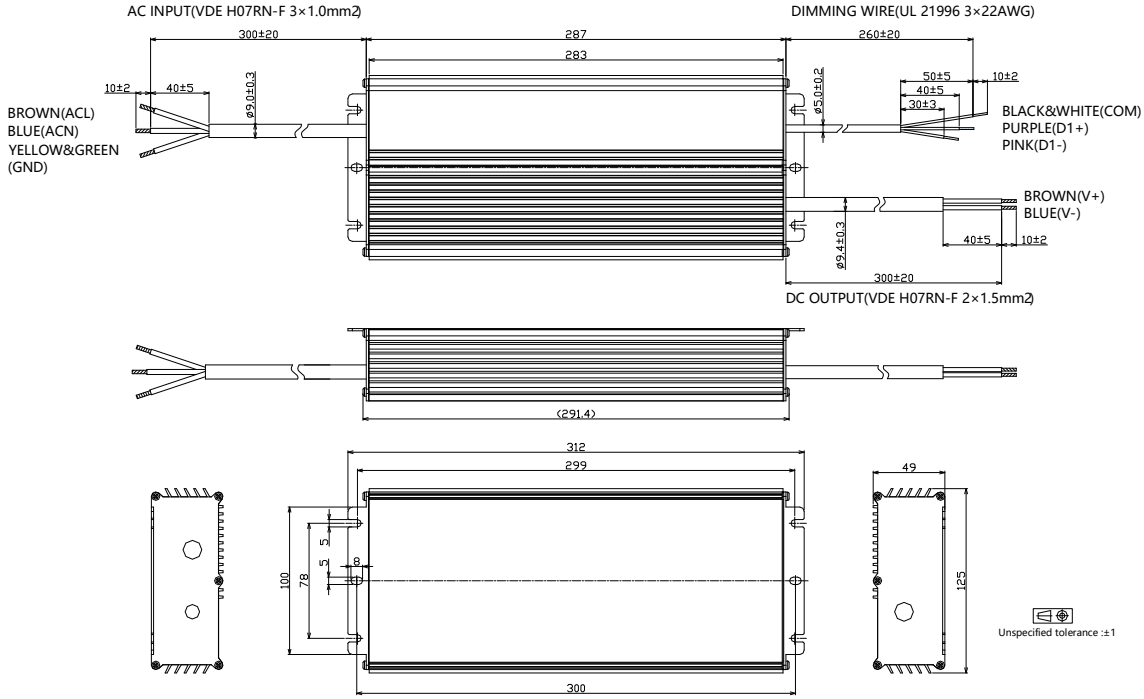
- **TLD-1K2-Cxxx-ARS (VDE Cable)**



- **TLD-1K2-Cxxx-ARS-DAX000 D4i Version (VDE Cable)**



- **TLD-1K2-Cxxx-MRS (VDE Cable)**



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)
-C750	7500	1200	96	160	750
	7300	1200	99	164	730
	7100	1200	101	169	710
	6900	1200	104	174	690
	6700	1200	107	179	670
	6500	1200	111	185	650
	6300	1200	114	190	630
	6100	1200	118	197	610
	5900	1200	122	203	590
	5700	1200	126	211	570
	5500	1200	131	218	550
	5300	1156	131	218	550
	5100	1113	131	218	550
	...	...	...	...	...
	550	120	131	218	550

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C540	5400	1200	133	222	540
	5300	1200	136	226	530
	5200	1200	138	231	520
	5100	1200	141	235	510
	5000	1200	144	240	500
	4900	1200	147	245	490
	4800	1200	150	250	480
	4700	1200	153	255	470
	4600	1200	157	261	460
	4500	1200	160	267	450
	4400	1200	164	273	440
	4300	1200	167	279	430
	4200	1200	171	286	420
	4100	1200	176	293	410
	4000	1200	180	300	400
	3900	1170	180	300	400
	3800	1140	180	300	400
	3700	1110	180	300	400
	...	...	...	...	...
	400	120	180	300	400

Revision History

Revision	Date	Contents
A	2025-1-10	Initial Release.
B	2025-5-19	Input voltage range updated in the model list.