400W, 200-480Vac Input, RGBW Quad Output LED Driver

Product Datasheet

The global certified TLD-400-C is a dual stage extremely wide input smart LED driver with **independent multi-channel** outputs. 10kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. All around protections including digital OTP with auto-recovery secure 24hour non-stop operation for luminaires.

☑ Stadium ☑ Flood ☑ Harbor

Features

- Absolute Supply Voltage: 180-528Vac
- Great Surge Immunity 10kV
- 93% Efficiency Max.
- Low Inrush Current
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Output Current Programmability
- Live Broadcasting Level Low Ripple
- DMX/RDM/DALI2.0 Dimmable
- Fast Dynamic Response
- DALI Part 150, 250 Support
- DALI Type 6 (SimplySnap Compatible)
- Global Certified Model Available
- IP67/IP66 Rated Waterproof
- 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	Certification
TLD-400-C12A-XYZ-NNNNS4 (To be stopped)	180-528Vac	P1: 100W P2: 100W P3: 100W P4: 100W	25-50Vdc	2A	3A	UL/FCC/CE
TLD-400-C10A-XYZ-NNNNS4	180-528Vac	P1: 100W P2: 100W P3: 100W P4: 100W	24-53Vdc	1.8A	2.5A	FCC/CE
TLD-400-C360-XYZ-NNNNS4	180-528Vac	P1: 100W P2: 100W P3: 100W P4: 100W	67-167Vdc	0.6A	0.9A	FCC/CE

XY=	Dimming Method	Programmable	Vaux	Dim-off
AN	DALI2.0/DT6	Cable	24V 150mA	√
MN	DMX512 + RDM	Cable	-	√

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	5 pin UL cable without Ground	6 pin UL cable with ground	5 pin VDE cable without ground	6 pin VDE cable with ground	5 pin VDE cable without ground
Certified Input Voltage Range	UL Listed Class P 200-480Vac	UL Listed Class P 200-480Vac	Class I 200-480Vac	Class I 200-480Vac	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	<15%@60-100%load, refer to THD vs. Load curve
Input Current	1.7Amax@277Vac & Full-Load, 1.0Amax@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 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%Io for programmable mode
Ripple Current	Ipk-pk: low frequency (<=3kHz) 2%Io max, high frequency (>3kHz) 15%Io max
TLA (Temporal Light Artifacts)	PstLM<0.02, SVM<0.05
Percent Flicker	1% max. Broadcasting level, GB/T-38539-2020
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 Tc≧105±10℃; Auto Recovery When Tc≦70±10℃
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	284x 90 x 41.5 by mm (body), 311 x 90 x 41.5 by mm (endcaps included)
Net Weight	2000g
Packing	See Package Information Section in the datasheet

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

Safety/EMC Compliance

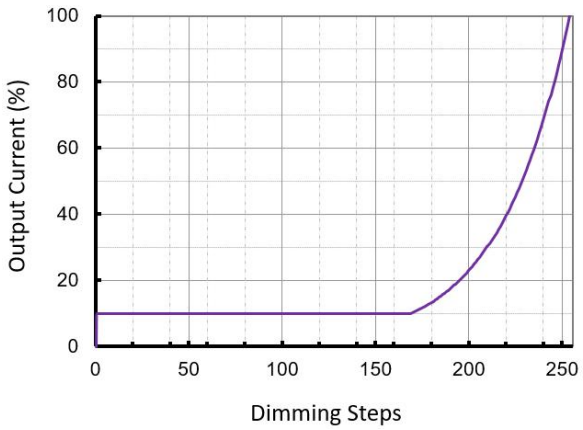
Safety Standards	Description
UL8750	Light emitting diode(LED) equipment for use in lighting products
UL1012/1310	Power units other than class 2 / Class 2 power units
IEC 61347-1	Lamp control gear Part 1: general and safety requirements
IEC 61347-2-13	Lamp control gear Part 2-13: particular requirement 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/FCC Part 15	Conducted emission test & radiated emission test; ANSI C63.4:2009 Class B
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
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

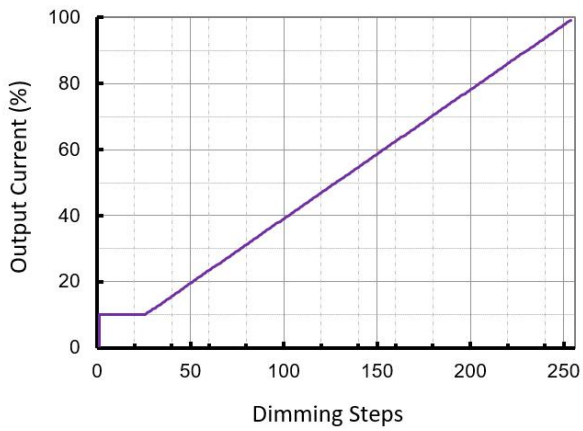
DALI Interface Standard	IEC62386, part 101,102,207,150,250		
DA1,DA2 High Level	9.5	16	22.5
DA1,DA2 Low Level	-6.5	0	6.5
DA1,DA2 Current	0		2mA
Default Memory Bank 1 CCT Value (Address 0x22 Definition)	CH1: Red, 0x01, CH2: Green, 0x02, CH3: Blue, 0x03, CH4: White, 0x05 (SimplySnap Compatible)		
DMX+ & 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		50ms	
Fast Dimming 10-100% Io Transition		30ms	
Flashing Speed	-	-	44fps

- DALI and DMX dimming curves

DALI Dimming Curve



DMX/RDM Dimming Curve

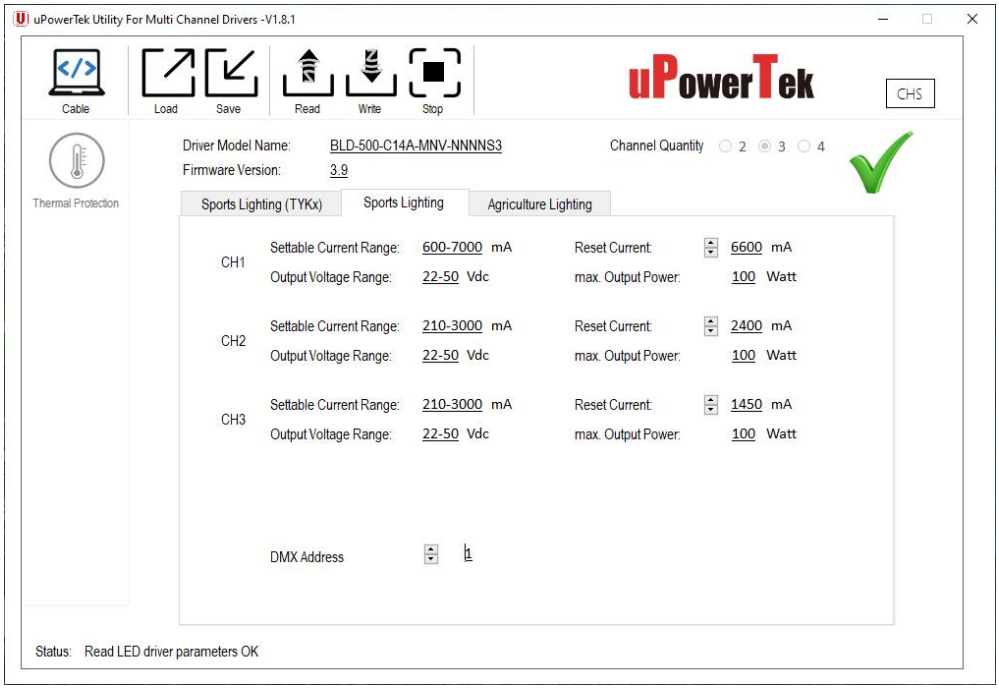


Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

Programming

- **Programmable Functions**

  uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current, Dimming Mode and DMX addressing can be set as basic programming functions. .

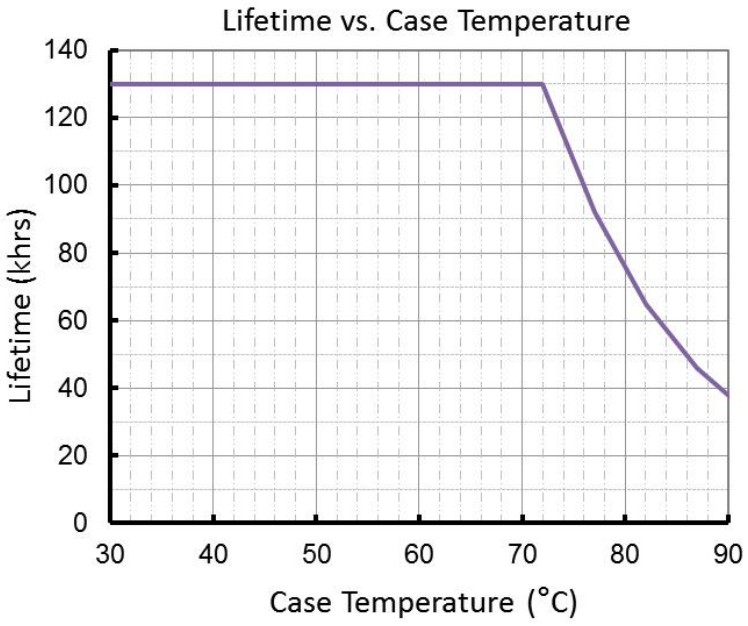


uPowreTek Programming Software Interface

- **Connection Guide**

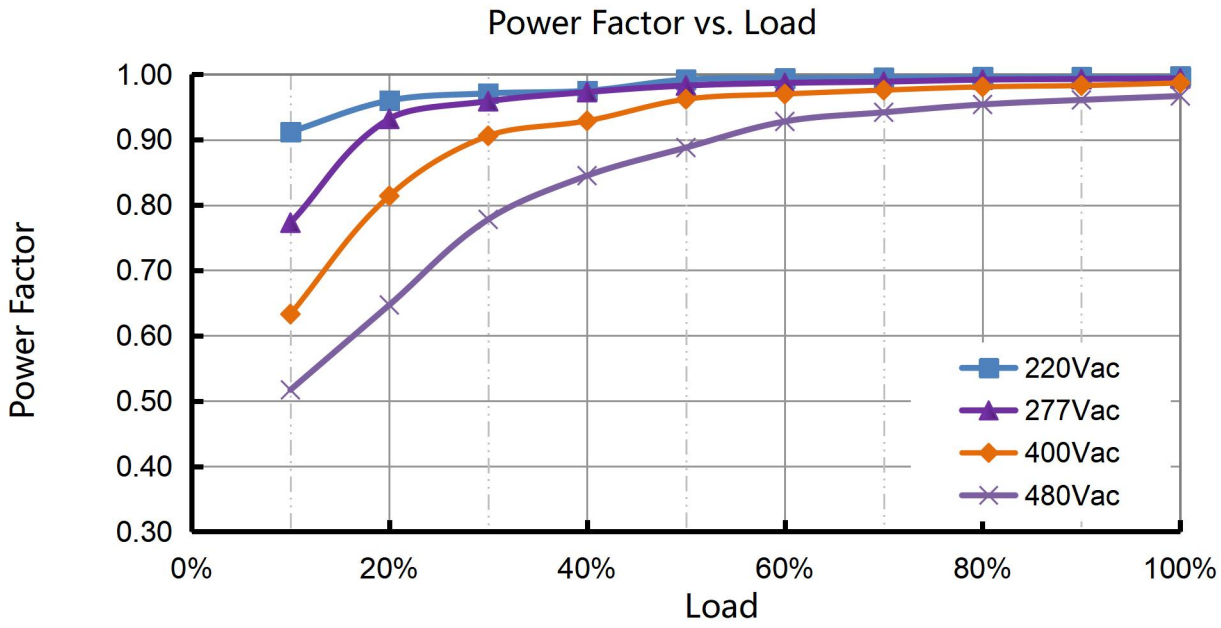
  This guide provides simple connection diagrams to help users understand the programming system. For more detailed operating instructions, including step-by-step procedures and additional configurations, please visit our website. You can download the comprehensive user manual and necessary software from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

Lifetime vs. Case Temperature

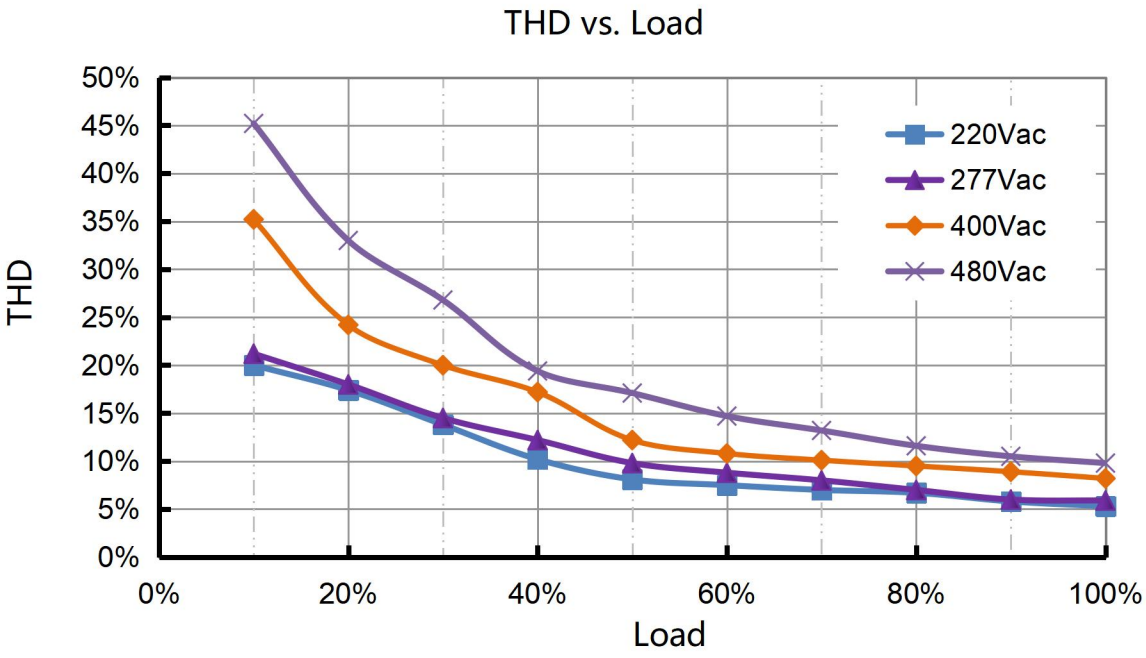


(End of Life: Maximum Failure Rate=10%)

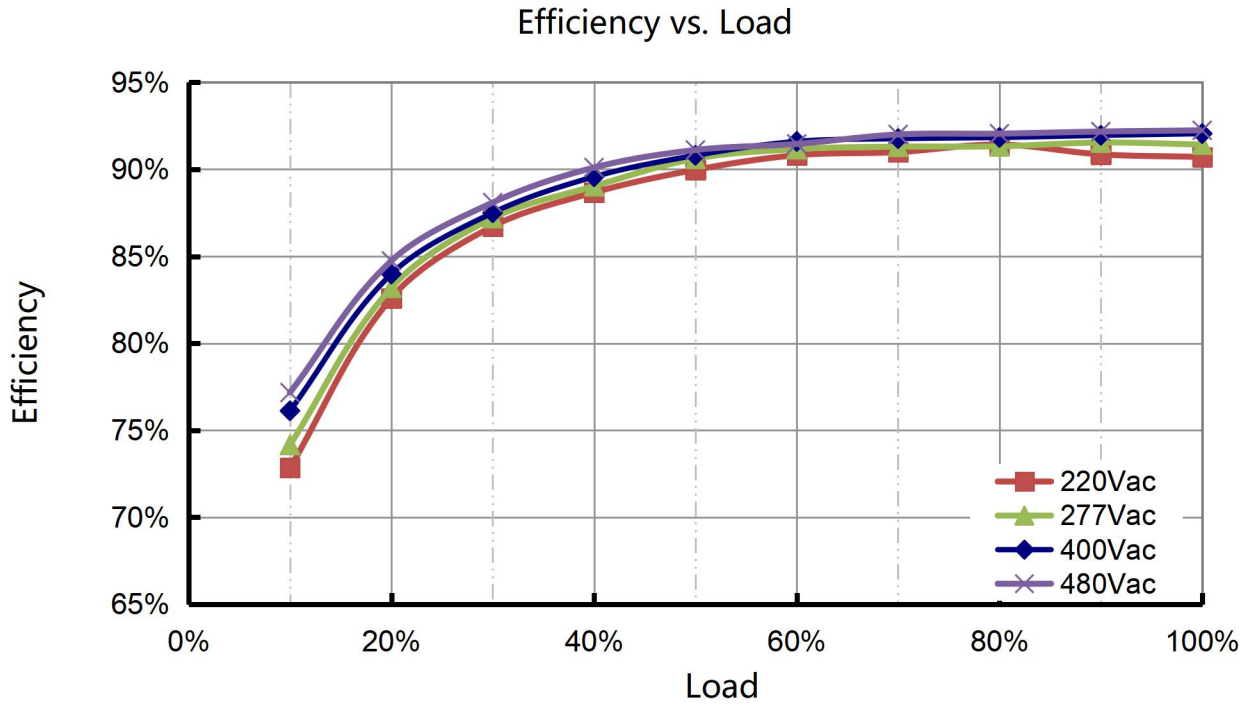
Power Factor vs. Load



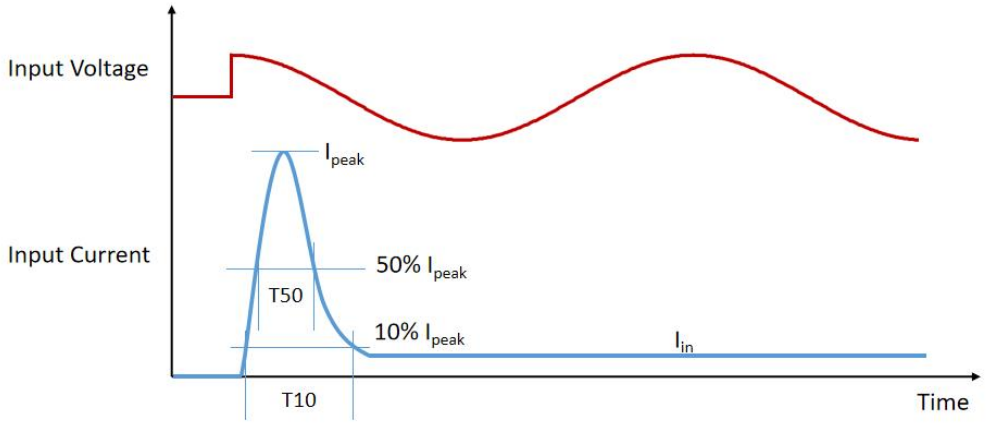
THD vs. Load



Efficiency vs. Load



Inrush Current

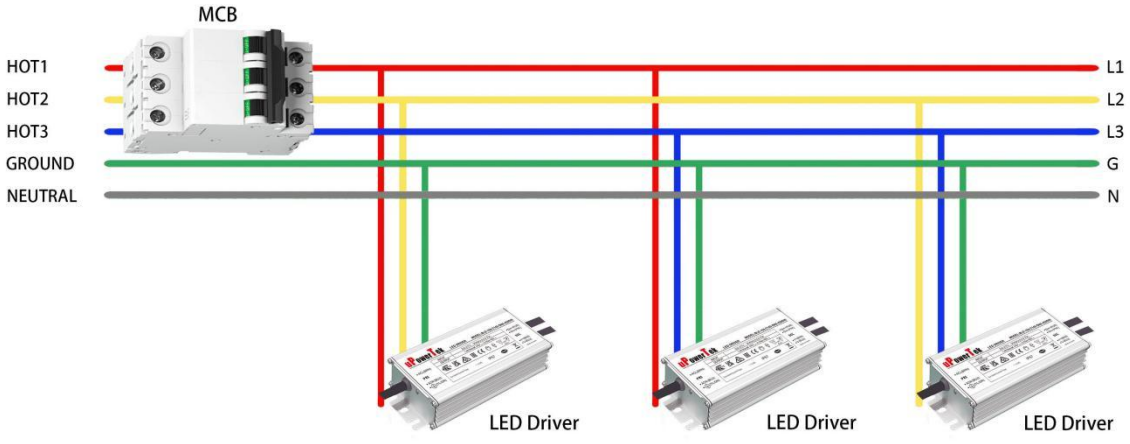


Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
220Vac	64A	824μs	400μs
277Vac	87.6A	804μs	390μs
400Vac	101.2A	680μs	320μs
480Vac	121.2A	660μs	300μs

- MCB Suggestion

Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
220Vac	3	4	7	9	3	5	8	11	4	6	10	12
277Vac	2	3	5	7	3	6	9	12	5	8	12	16
400Vac	3(x3)	4(x3)	7(x3)	9(x3)	3(x3)	5(x3)	8(x3)	11(x3)	4(x3)	6(x3)	10(x3)	12(x3)
480Vac	2(x3)	3(x3)	5(x3)	7(x3)	3(x3)	6(x3)	9(x3)	12(x3)	5(x3)	8(x3)	12(x3)	16(x3)

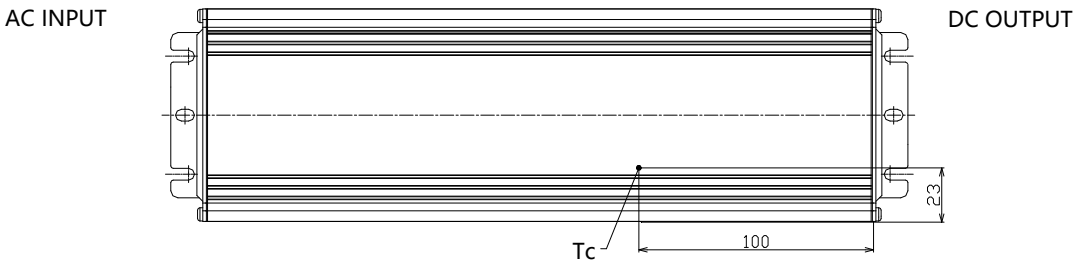
Three phase wiring suggestion.



Dielectric Strength

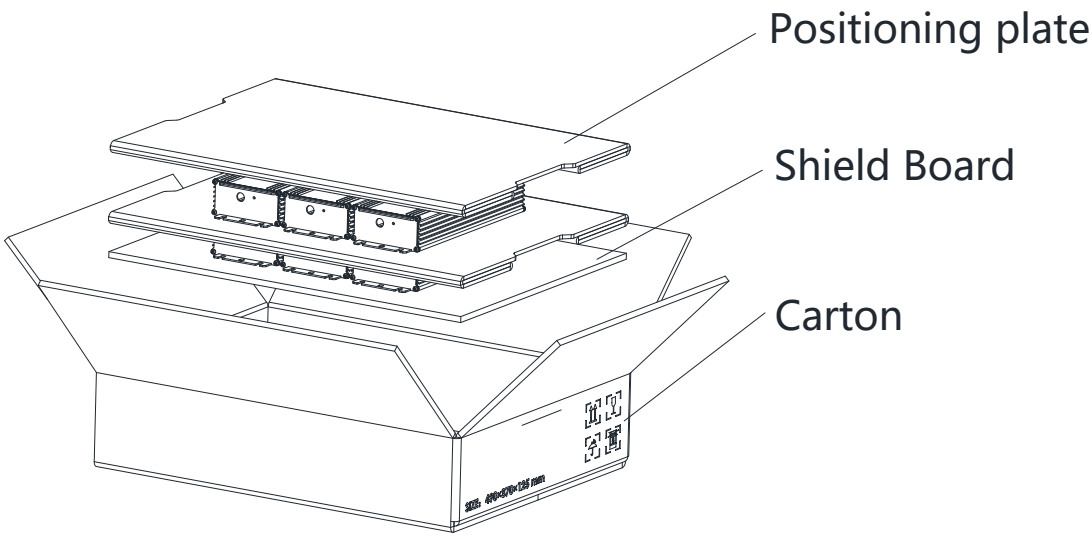
Unit: Vac	Input	Output	Dimming	Case
Input	-	3920	3920	1960
Output	3920	-	1960	1960
Dimming	3920	1960	-	1960
Case	1960	1960	1960	-

Tc Point



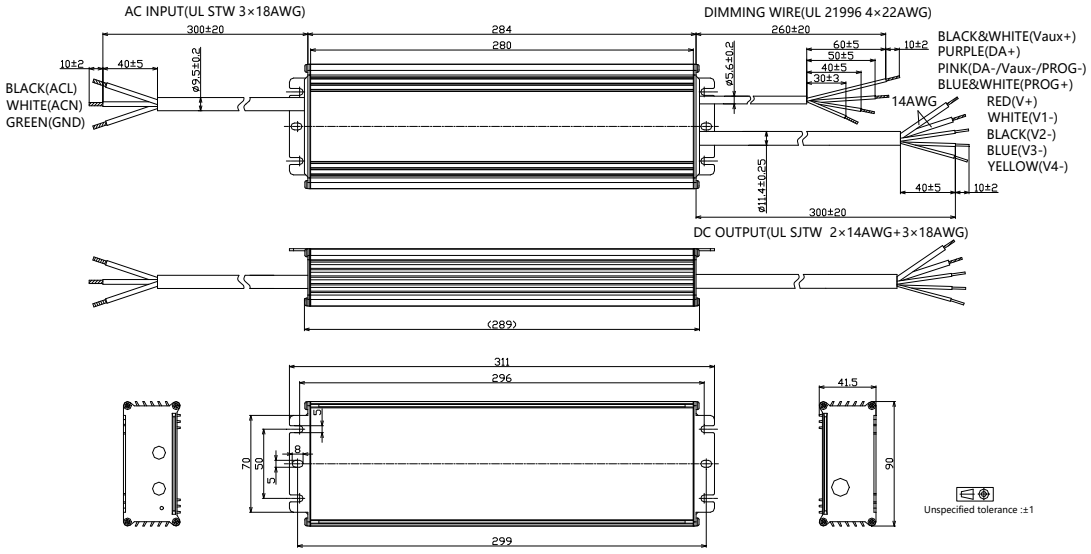
Packaging Information

Typical Carton Dimension(L×W×H)	490×370×125 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	6pcs/carton
Net Weight	12.0 kg/carton
Gross Weight	12.9 kg/carton

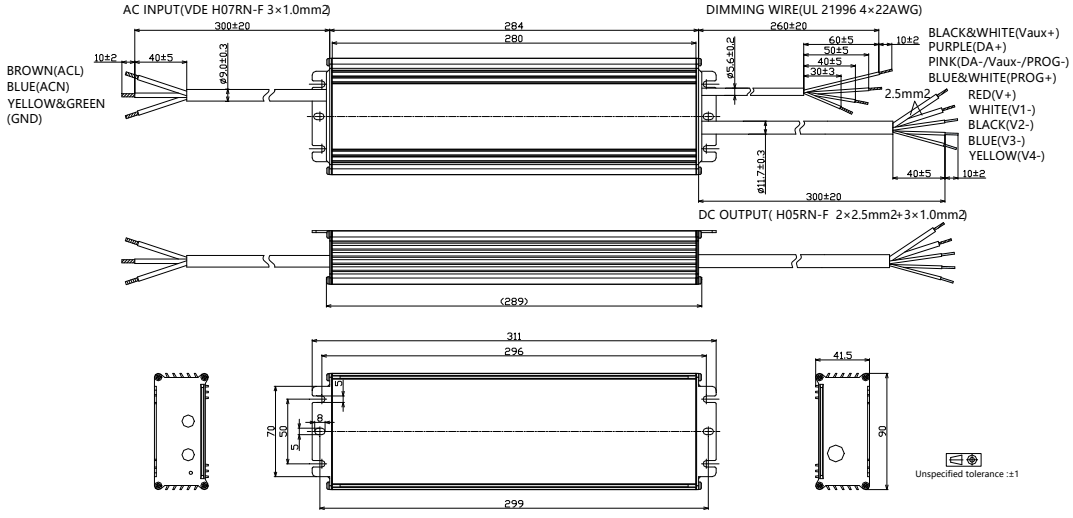


Mechanical Design

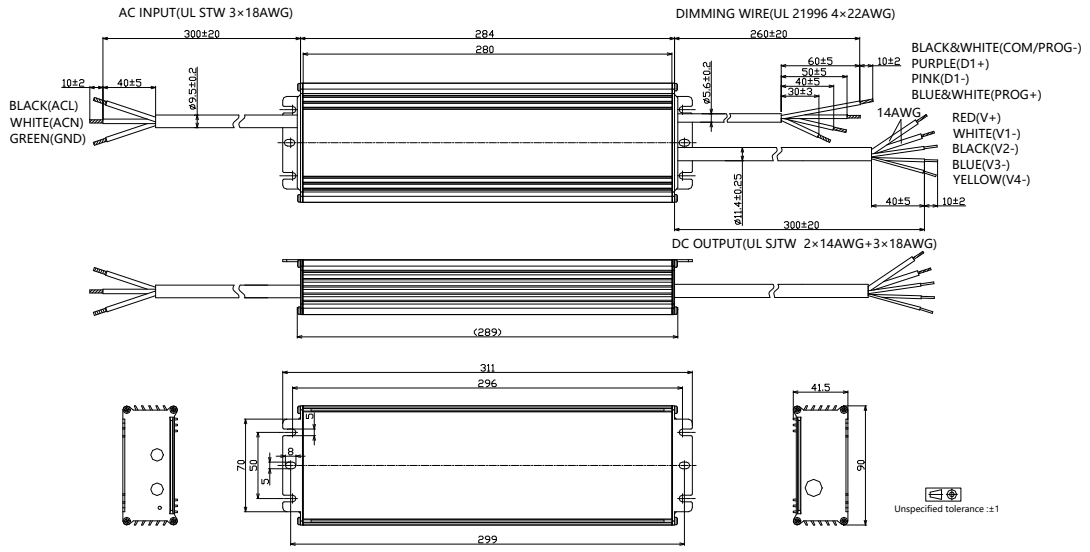
- TLD-400-CXXX-ANU-NNNNS4



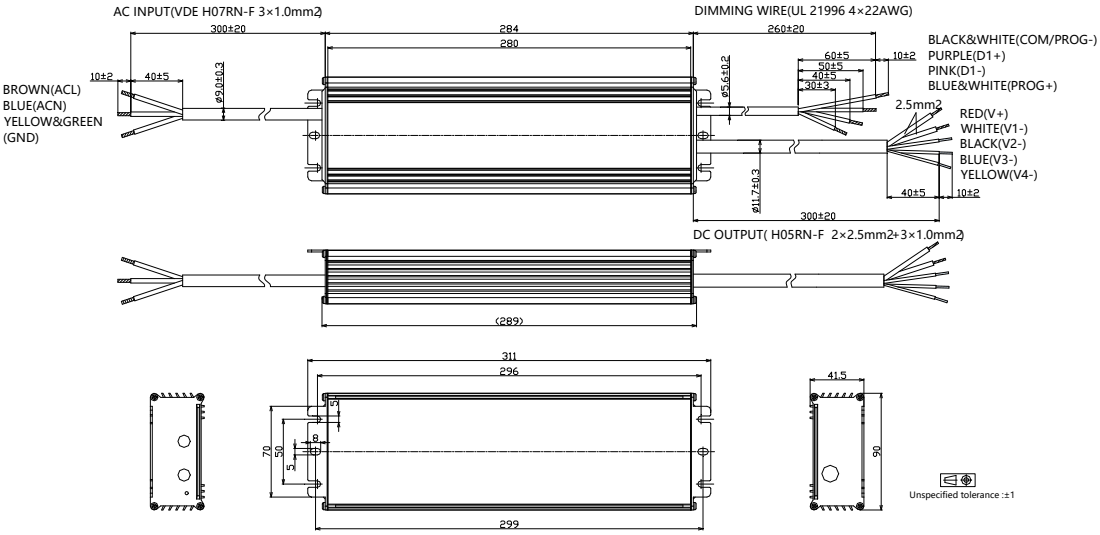
- TLD-400-CXXX-ANS-NNNNS4



TLD-400-CXXX -MNU-NNNNS4



TLD-400-CXXX -MNS-NNNNS4



Output Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W) /Each Channel	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C12A	3000	400/100	25	33	300
	2900	400/100	26	34	290
	2800	400/100	27	36	280
	2700	400/100	28	37	270
	2600	400/100	29	38	260
	2500	400/100	30	40	250
	2400	400/100	31	42	240
	2300	400/100	33	43	230
	2200	400/100	34	45	220
	2100	400/100	36	48	210
	2000	400/100	38	50	200
	1900	380/95	38	50	200
	1800	360/90	38	50	200
	…	…	…	…	…
	200	40/10	37.5	50	200

Model	Typical Set Output Current (mA)	Max Output Power (W) /Each Channel	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
C10A	2500	400/100	24	40	250
	2400	400/100	25	42	240
	2300	400/100	26	43	230
	2200	400/100	27	45	220
	2100	400/100	29	48	210
	2000	400/100	30	50	200
	1900	400/100	32	53	190
	1800	380/95	32	53	190
	1700	356/89	32	53	190
	1600	332/84	32	53	190
	…	…	…	…	…
	190	40/10	32	53	190

Model	Typical Set Output Current (mA)	Max Output Power (W) /Each Channel	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
C360	900	400/100	67	111	90
	850	400/100	71	118	85
	800	400/100	75	125	80
	750	400/100	80	133	75
	700	400/100	86	143	70
	650	400/100	92	154	65
	600	400/100	100	167	60
	550	368/92	100	167	60
	500	332/83	100	167	60
	450	300/75	100	167	60
	…	…	…	…	…
	60	40/10	100	167	60

Revision History

Revision	Date	Contents
A	2024-01-07	New Release
B	2024-02-13	1. Package updated. 2. DALI dimmable model mechanical design updated.
C	2024-07-25	1. Fast dimming description added 2. Power factor, THD, efficiency curves updated by 10-100% load range 3. MCB usage and driver quantity section added 4. Inrush current data updated 5. New models added.
D	2024-11-16	1. DALI memory bank 1 definition for RGB(W) application