uPowerTek

Product Datasheet

The global certified SLK-1K1-C is a non-isolated extremely wide input smart LED driver. 10kV surge protection level, 100khour long life and 5-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.

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

Features

- Absolute Supply Voltage: 180-440Vac
- 97% Efficiency Max.
- Non-isolated Design
- Output Cable with Ground Wire (Optional)
- Low Inrush Current
- 100,000Hour Life @ Tc=75℃
- 5 Year Warranty @ Tc<=75℃
- Airset^{TM} NFC Programmability

- +/-2% Output Current Accuracy
- Isolated 0-10V/PWM/Time/DALI2.0 Dimmable
- 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
SLK-1K1-C280-XYZ	180-440Vac	1000 W	214-500Vdc	2A	2.8A
SLK-1K1-C320-XYZ	180-440Vac	1000 W	188-357Vdc	2.8A	3.2A
SLK-1K1-C400-XYZ	180-440Vac	1000 W	150-313Vdc	3.2A	4A

XY=	Dimming Method	Programmable	12Vaux	Dim-off
EN	0-10V/PWM/Time/Resistor	Cable	300mA	√
ER	0-10V/PWM/Time/Resistor	NFC Wireless	300mA	√
AR	DALI2.0	NFC Wireless	-	√
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 200-400Vac	UL Listed Class P FCC 200-400Vac	ENEC CB RCM Class I 220-400Vac	ENEC CB RCM Class I 220-400Vac	Class II 220-400Vac

■ Technical Data

Input Voltage	180-440Vac
Input Frequency	47～63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<25%@70-100%load, refer to THD vs. Load curve
Input Current	5.3Amax@208Vac & Full-Load, 5Amax@220Vac & Full-Load 3.7Amax@277Vac & Full-Load, 2.8Amax@380Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	0.75MIU max @347Vac 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
Ripple Current	Ipk-pk: low frequency (<=3kHz) 1%Io typ., 2%Io max. high frequency (>3kHz) 12%Io typ., 15%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
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	364 x 90 x 41.5 by mm (body), 391 x 90 x 41.5 by mm (endcaps included)
Net Weight	2540g
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/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

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, 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
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		

- **Quick Flashing**

Parameter	Min.	Typ.	Max.
0-10V Dimming Models	-	-	30fps
DALI and DMX Dimming Models	-	-	44fps

- **Default Dimming Curves**

a. **0-10V dimming without dim-off**
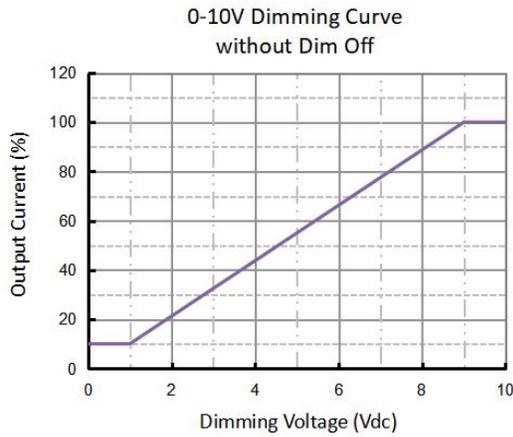
b. **0-10V dimming with dim-off**

0-10V Dimming Curve without Dim Off

0-10V Dimming Curve with Dim Off

c. **DALI and DMX dimming curves**
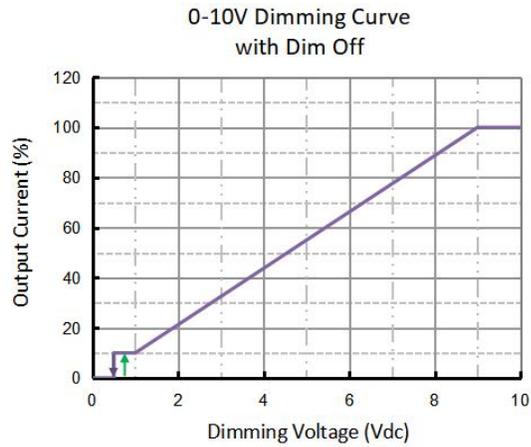
DALI Dimming Curve

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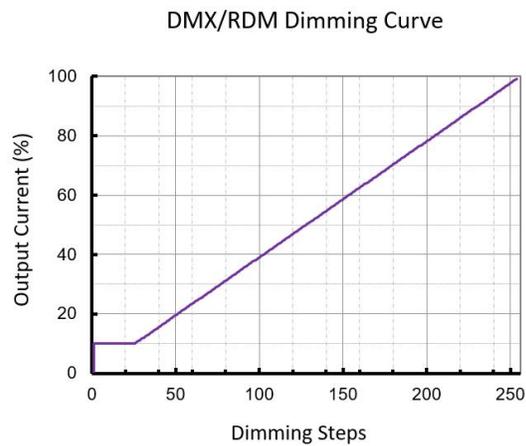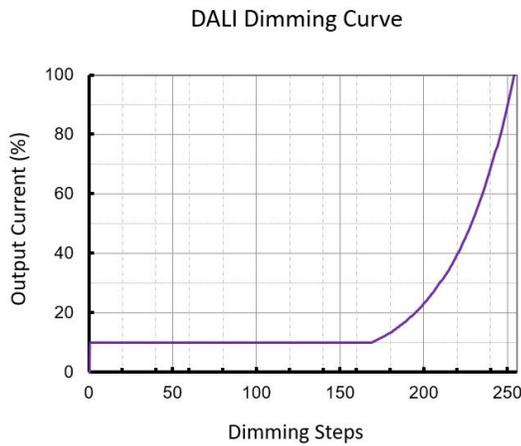
Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

■ Programming

- **Programmable Functions**

uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current, Dimming Mode, 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.
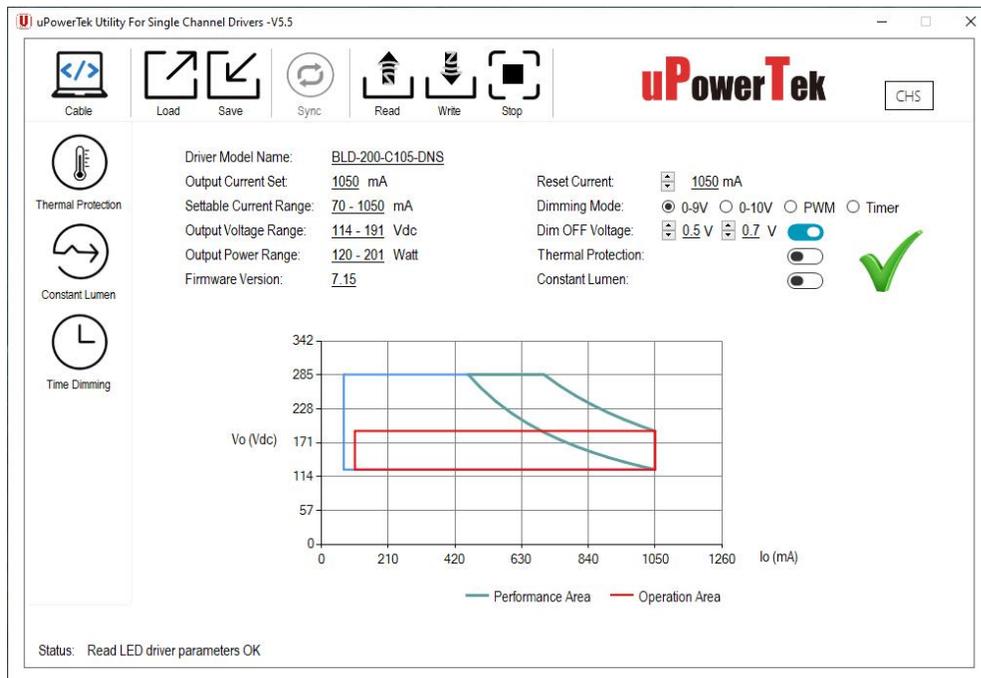
uPowreTek Programming Software Interface

- **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/.
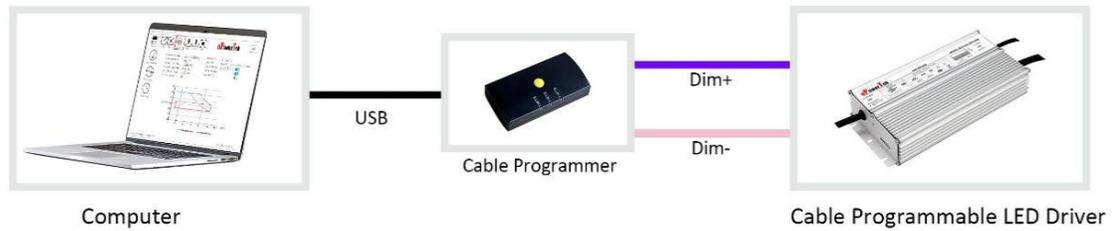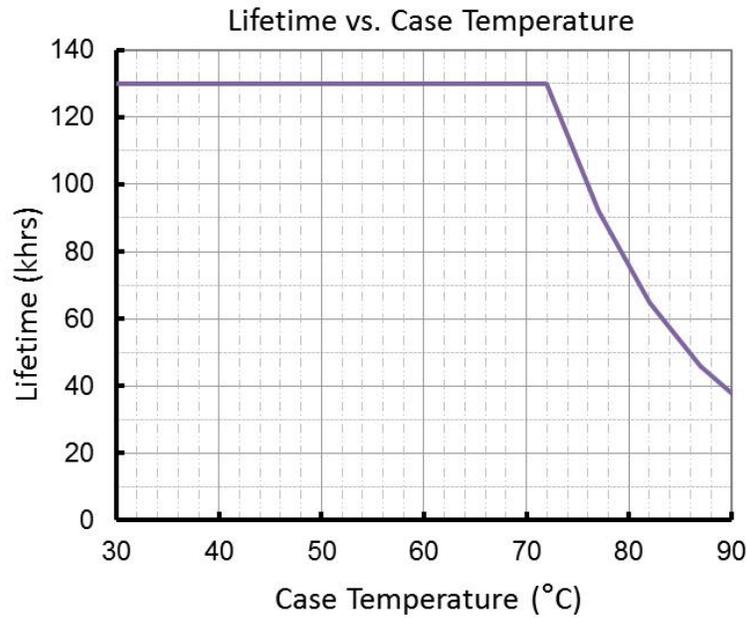

Wired Programming

Wireless Programming

Cellphone Programming

■ Lifetime vs. Case Temperature
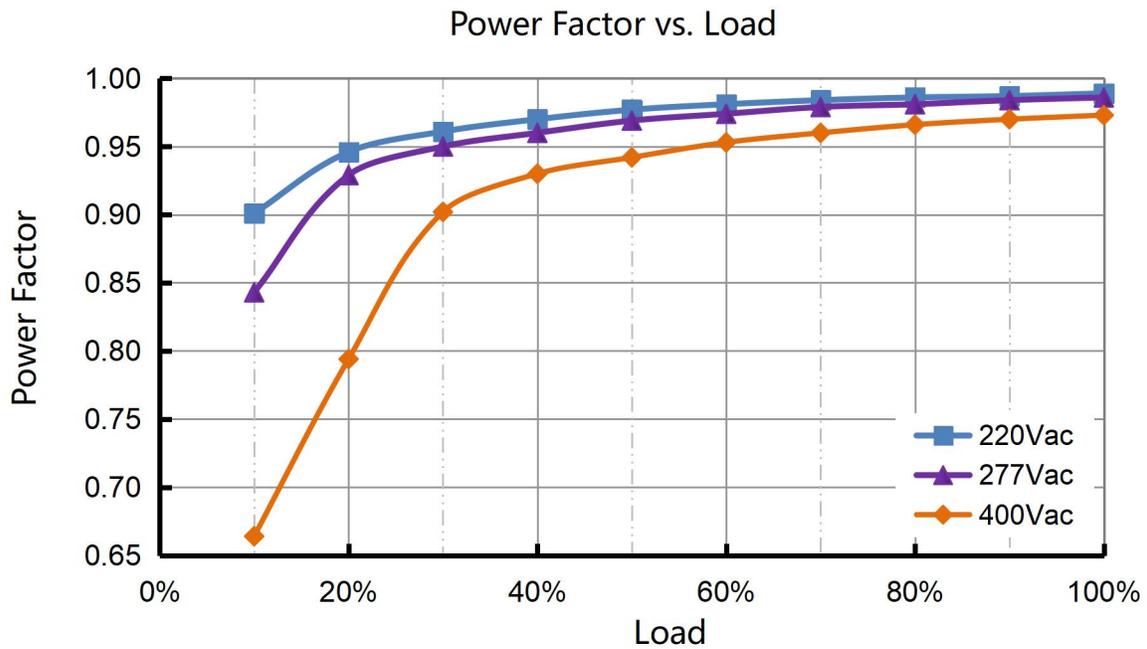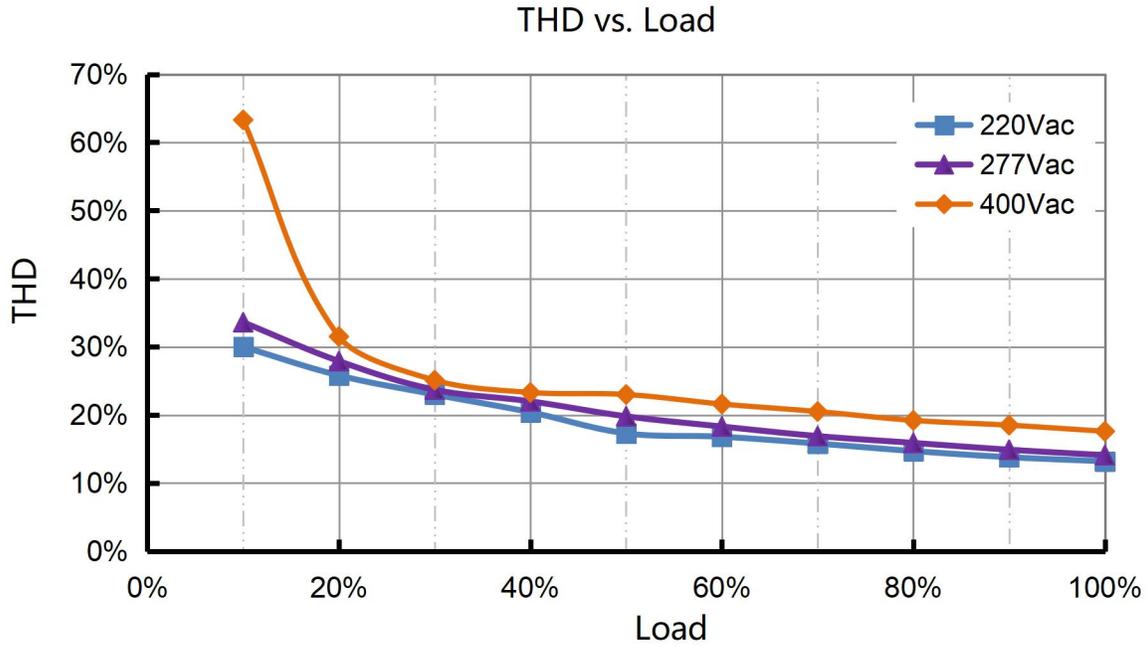
Lifetime vs. Case Temperature

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

■ Power Factor vs. Load

Power Factor vs. Load

■ THD vs. Load

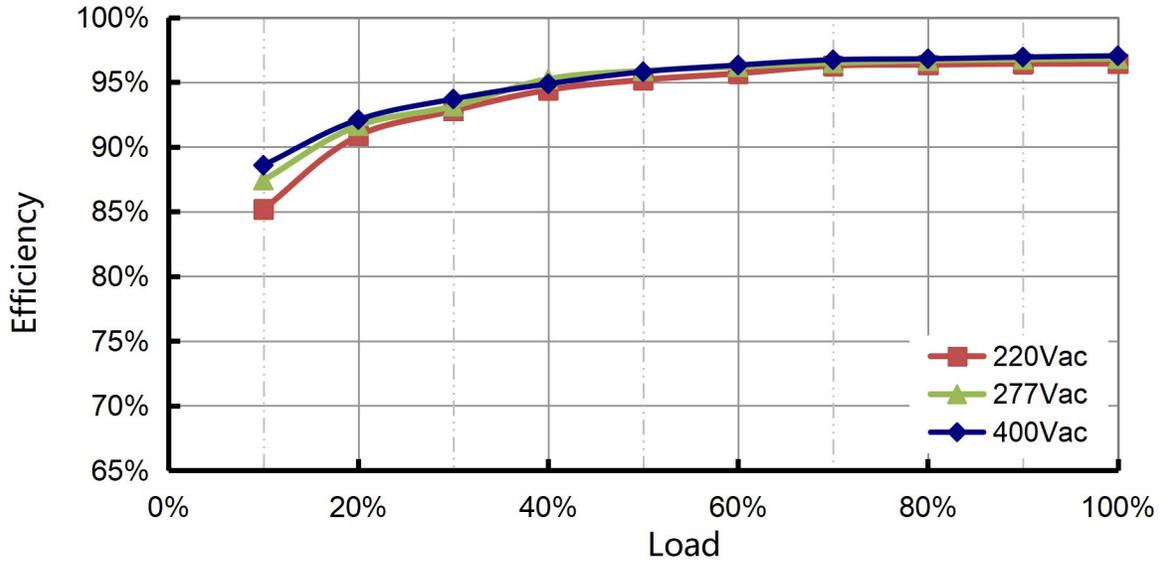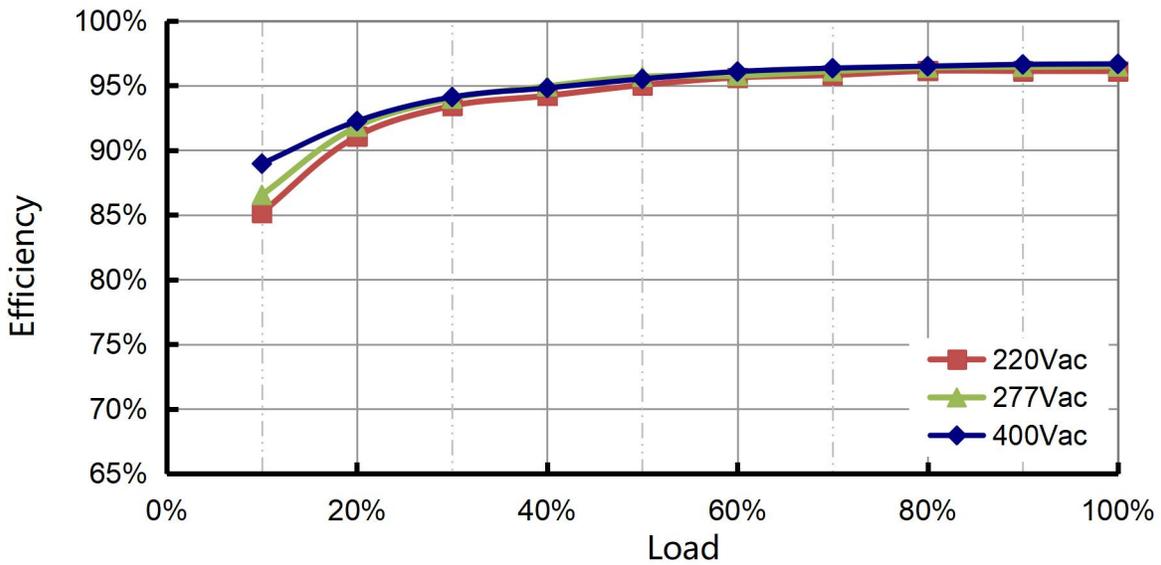THD vs. Load

■ Efficiency vs. Load

Efficiency vs. Load (C280)
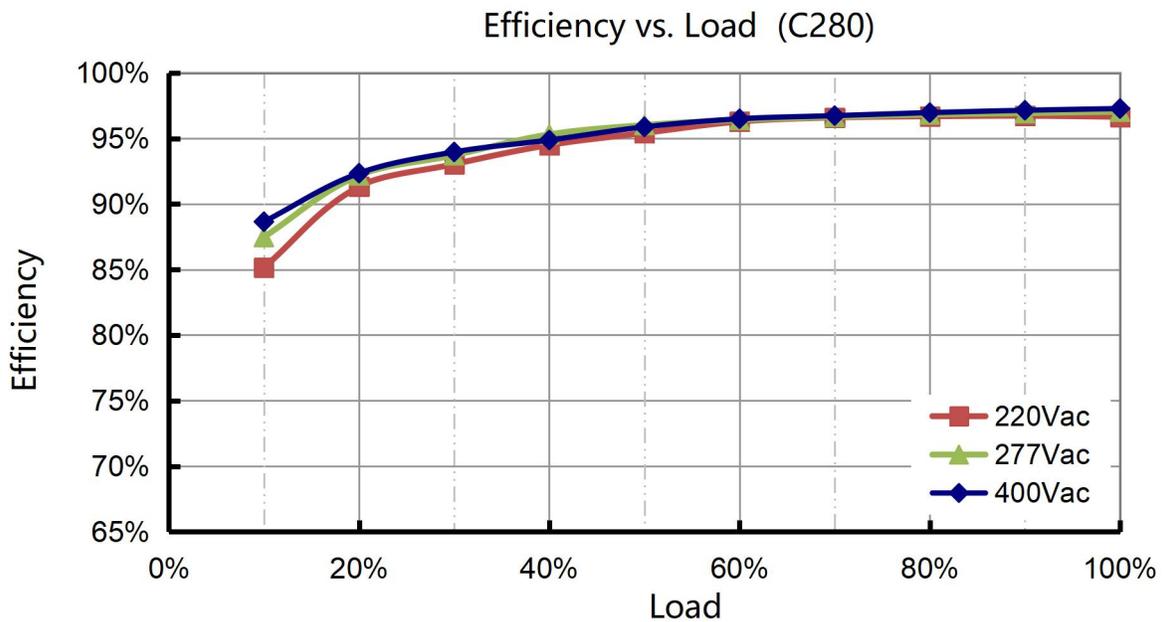
Efficiency vs. Load (C320)

Efficiency vs. Load (C400)

■ Inrush Current
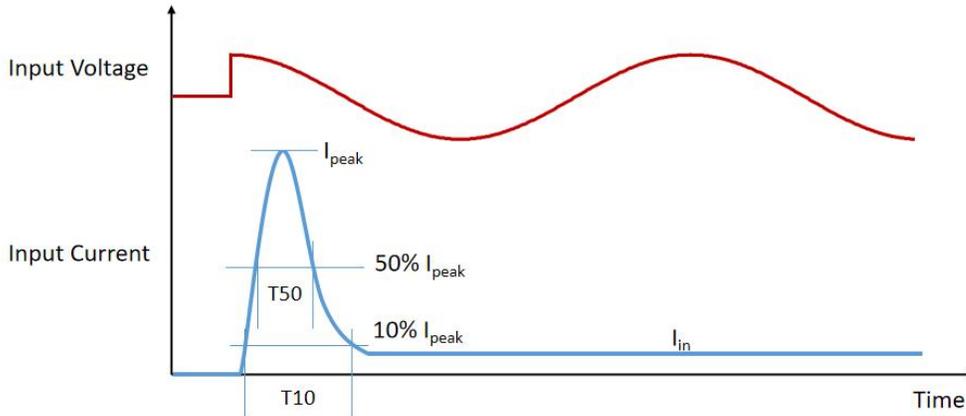
Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
220Vac	5.4A	18.4ms	8ms
277Vac	7.1A	18ms	7.5ms
400Vac	13.3A	15.4ms	7ms

- MCB Suggestion

Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
220Vac	1	2	3	4	1	2	3	4	1	2	4	5
277Vac	1	2	3	5	1	2	4	5	2	3	5	6
400Vac	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.
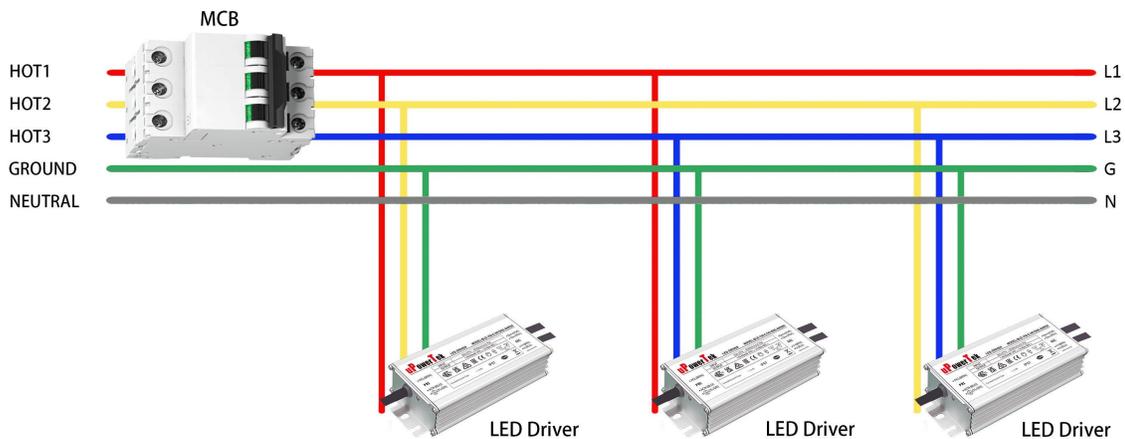
Dielectric Strength

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

Tc Point

AC INPUT   DC OUTPUT
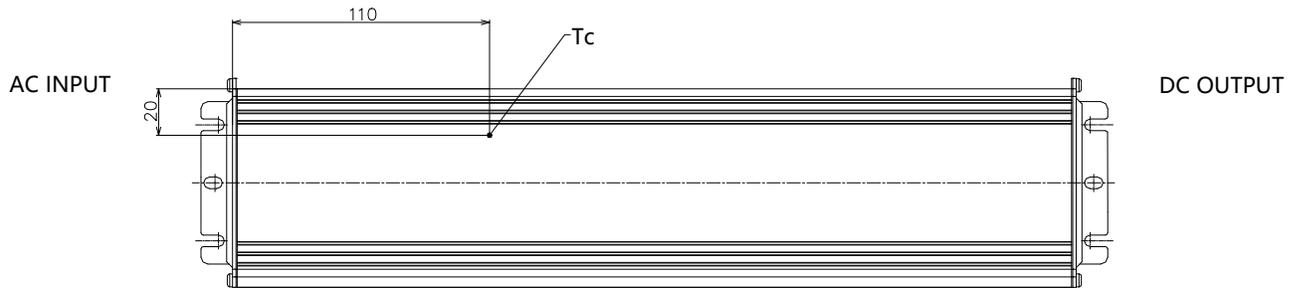
Packaging Information

Typical Carton Dimension(L×W×H)	490×280×130 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	4pcs/carton
Net Weight	10.2 kg/carton
Gross Weight	10.8 kg/carton

Positioning plate

Shield Board

Carton
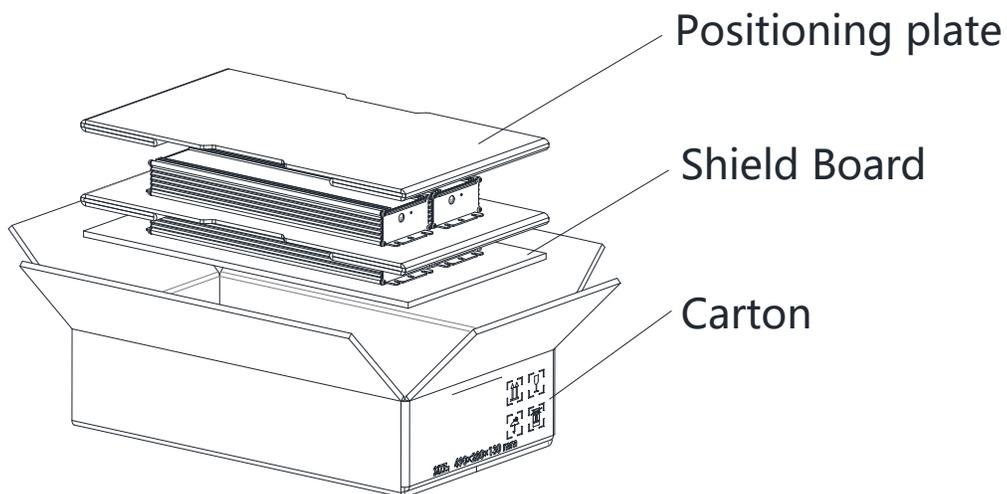
■ Mechanical Design

- **SLK-1K1-Cxxx-ER/ENU (UL Cable)**
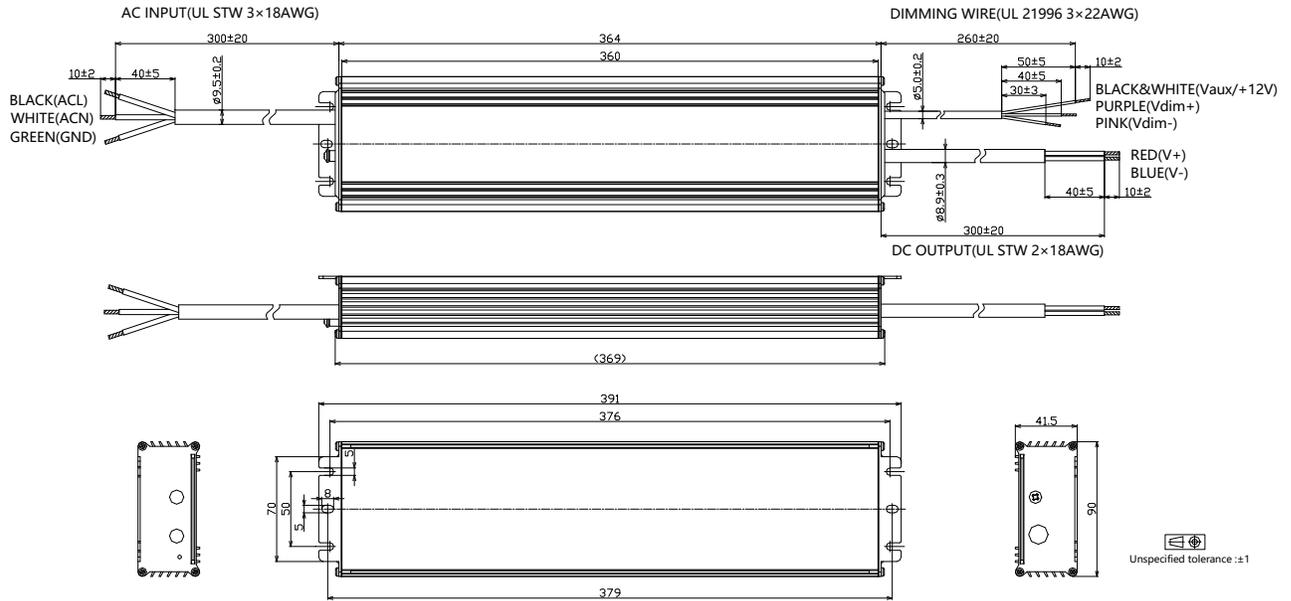
- **SLK-1K1-Cxxx-ARU (UL Cable)**
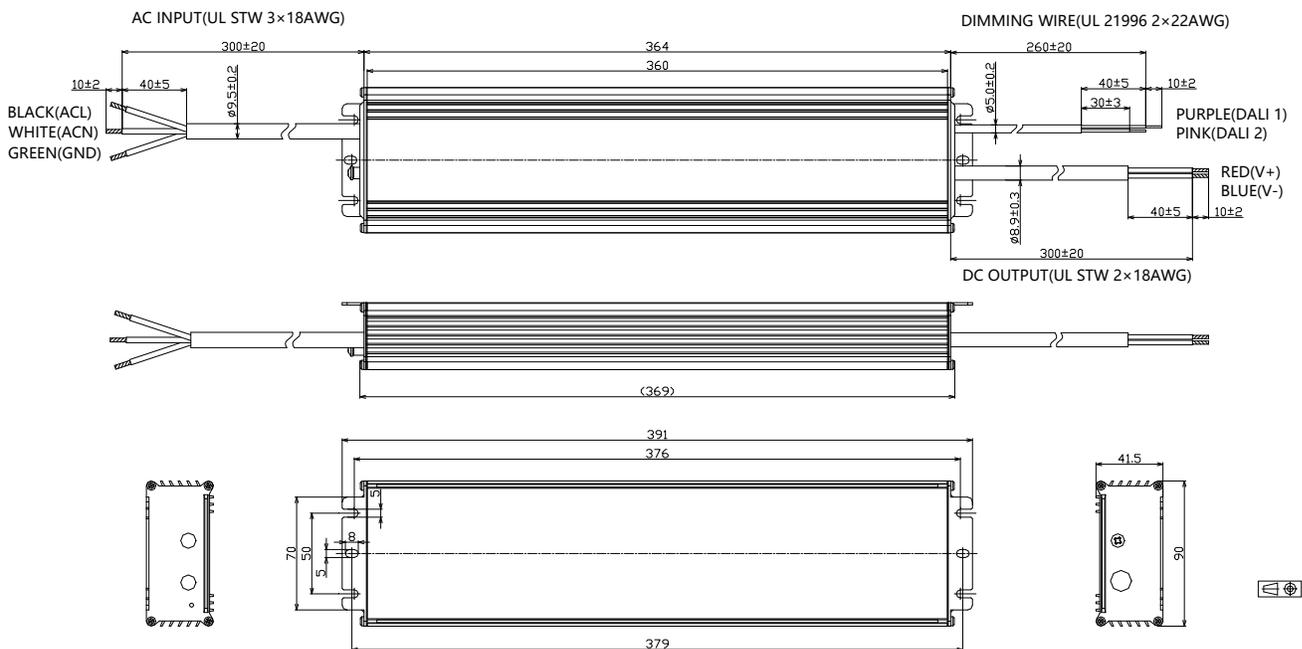
- **SLK-1K1-Cxxx-MRU (UL Cable)**

AC INPUT(UL STW 3×18AWG)

DIMMING WIRE(UL 21996 3×22AWG)

BLACK(ACL)
WHITE(ACN)
GREEN(GND)

BLACK&WHITE(COM)
PURPLE(D1+)
PINK(D1-)

RED(V+)
BLUE(V-)

DC OUTPUT(UL STW 2×18AWG)

Unspecified tolerance :±1
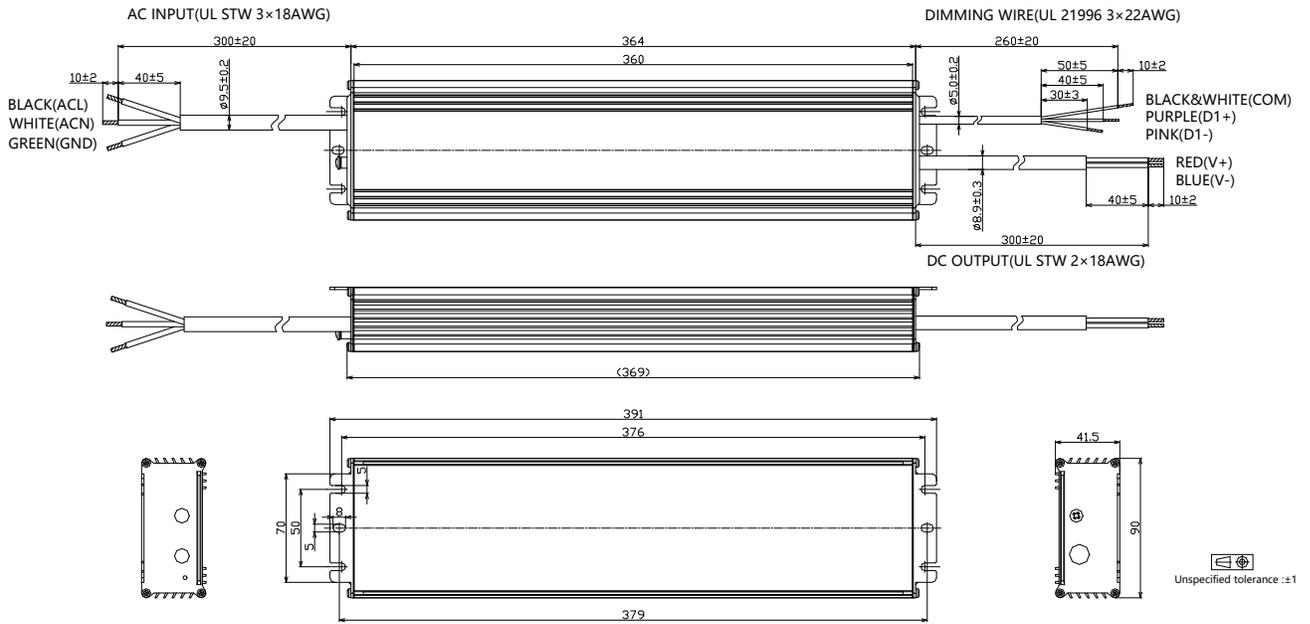
- **SLK-1K1-Cxxx-EN/ERS (VDE Cable)**

AC INPUT(VDE H07RN-F 3×1.0mm2)

DIMMING WIRE(UL 21996 3×22AWG)

BROWN(ACL)
BLUE(ACN)
YELLOW&GREEN
(GND)

BLACK&WHITE(Vaux/+12V)
PURPLE(Vdim+)
PINK(Vdim-)

BROWN(V+)
BLUE(V-)

DC OUTPUT(VDE H07RN-F 2×1.0mm2)

Unspecified tolerance :±1
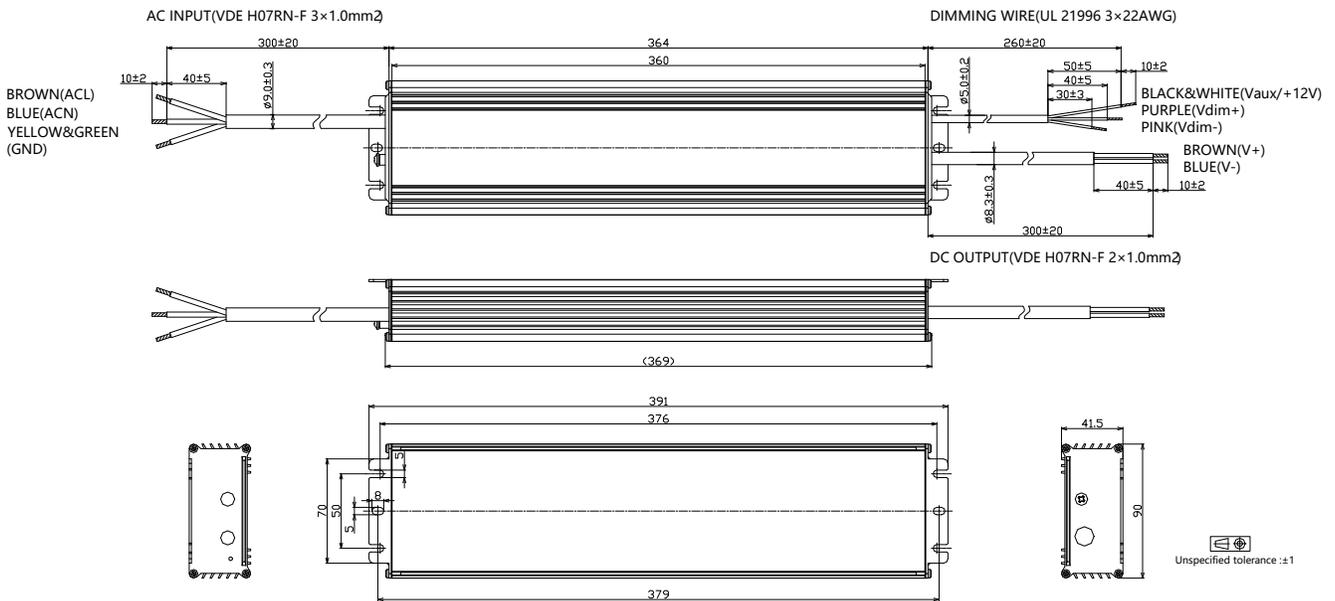
- **SLK-1K1-Cxxx-ARS (VDE Cable)**

AC INPUT(VDE H07RN-F 3×1.0mm²)

DIMMING WIRE(UL 21996 2×22AWG)

BROWN(ACL)
BLUE(ACN)
YELLOW&GREEN
(GND)

PURPLE(DALI 1)
PINK(DALI 2)

BROWN(V+)
BLUE(V-)

DC OUTPUT(VDE H07RN-F 2×1.0mm²)

Unspecified tolerance :±1
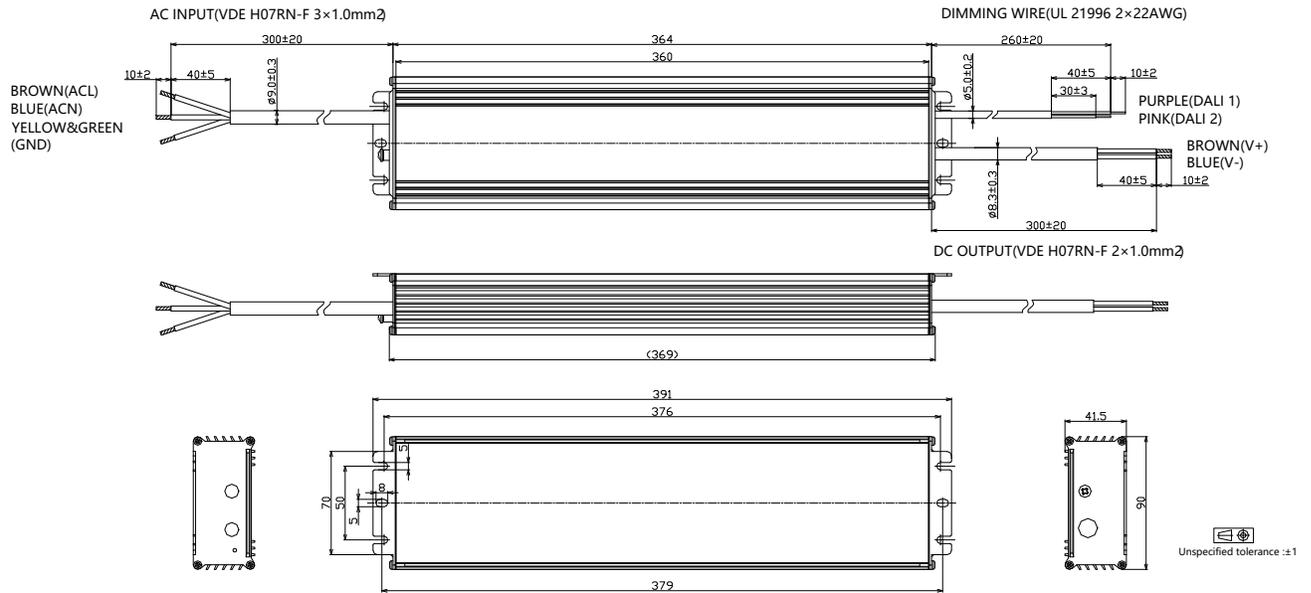
- **SLK-1K1-Cxxx-MRS (VDE Cable)**

AC INPUT(VDE H07RN-F 3×1.0mm²)

DIMMING WIRE(UL 21996 3×22AWG)

BROWN(ACL)
BLUE(ACN)
YELLOW&GREEN
(GND)

BLACK&WHITE(COM)
PURPLE(D1+)
PINK(D1-)

BROWN(V+)
BLUE(V-)

DC OUTPUT(VDE H07RN-F 2×1.0mm²)

Unspecified tolerance :±1
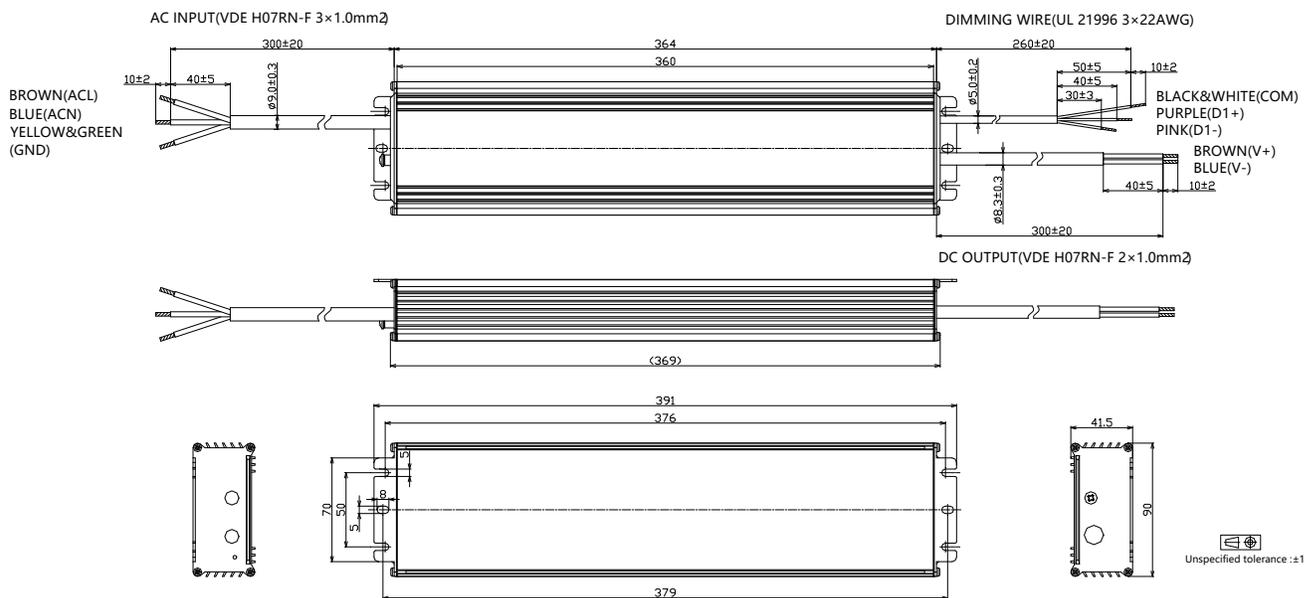
■ Output Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C280	2800	1000	214	357	280
	2700	1000	222	370	270
	2600	1000	231	385	260
	2500	1000	240	400	250
	2400	1000	250	417	240
	2300	1000	261	435	230
	2200	1000	273	455	220
	2100	1000	286	476	210
	2000	1000	300	500	200
	1900	950	300	500	200
	1800	900	300	500	200
	1700	850	300	500	200
	...	...	...	...	...
	200	100	300	500	200

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C320	3200	1000	188	313	320
	3100	1000	194	323	310
	3000	1000	200	333	300
	2900	1000	207	345	290
	2800	1000	214	357	280
	2700	964	214	357	280
	2600	929	214	357	280
	2500	893	214	357	280
	2400	857	214	357	280
	2300	821	214	357	280
	2200	786	214	357	280
	2100	750	214	357	280
	...	...	...	...	...
	280	100	214	357	280

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C400	4000	1000	150	250	400
	3900	1000	154	256	390
	3800	1000	158	263	380
	3700	1000	162	270	370
	3600	1000	167	278	360
	3500	1000	171	286	350
	3400	1000	176	294	340
	3300	1000	182	303	330
	3200	1000	188	313	320
	3100	969	188	313	320
	3000	938	188	313	320
	2900	906	188	313	320
	…	…	…	…	…
	320	100	188	313	320

■ Revision History

Revision	Date	Contents
A	2022-08-22	1. First Release
B	2022-10-14	1. Mechanical design data updated
C	2022-11-04	1. Tc point, packaging information updated
D	2022-12-14	1. DMX dimmable models mechanical design updated
E	2023-02-10	1. New models added
F	2023-07-14	1. Update cable selection table in Model List Section
G	2023-12-01	1. Update PF THD and Eff. curves
H	2024-07-16	1. Fast dimming and quick flashing description added 2. Ripple current spec, PstLm, SVA and Percentage Flicker added 3. Power factor, THD, efficiency curves updated by 10-100% load range 4. MCB usage and driver quantity section added 5. Inrush current data updated