Product Datasheet

The global certified BLD-400-C is an extremely high efficiency **smart LED driver for tunable spectrum grow lights**. 100khour long life and 7-year warranty provide high confidence to luminaire users. NFC and cable programming are both available for users. All around protections including digital OTP with auto-recovery secure non-stop operation for luminaires.

Features

- Absolute Supply Voltage: 90-305Vac
- **4 Independent Channel Outputs Max.**
- Ground Wire at Output
- 94% Efficiency Max.
- Low Inrush Current
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Multiple Channel Programmability
- Knob Dimming
- RJ25 Daisy Chain Connection
- Dim Off with 0.5W Standby Power
- 12V 300mA Auxiliary Power to Power Controllers and Fans
- UL Class P
- Safety according to UL8750, EN 61347-1, 61347-2-13, 62384

Model List

Model Number	Input Voltage Range	Output Channel	Max Output Power	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max	Protocol
BLD-400-C990-ENZ #abcdTS	90-305Vac	1	P1: 400W	30 - 58Vdc	6.9A	9.9A	0-10V
		2	P2: 100W	22 - (V_{CH1}-8V)	2.1A	3A	
		3	P3: 100W	22 - (V_{CH1}-8V)	2.1A	3A	
		4	P4: 100W	22 - (V_{CH1}-8V)	2.1A	3A	

Note: 1. P=P1+P2+P3+P4, P is <=400W
2. See the Output Operation Range Section for programmable model details
3. Suffix #abcd definition is shown in the Mechanical Design section
4. TS=T2, 2 channel version, TS=T3, 3 channel version, TS=T4, 4 channel version

Z=	U	V	S	Check with Sales	W	D
Input Cable	3 pin UL cable with ground	3 pin UL cable with ground	3 pin VDE cable with ground	3 pin Global cable with ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Output Cable	UL cable without ground	UL cable with ground	VDE cable without ground	Global cable with ground	VDE cable with ground	VDE cable without ground
Certified with	UL Listed Class P FCC 120-277Vac	UL Listed Class P FCC 120-277Vac	Class I 120-277Vac	UL Recognized Class I 120-277Vac	Class I 120-277Vac	Class II 120-277Vac

Technical Data

Input Voltage	90～305Vac
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	3.6Amax@120Vac & Full-Load, 2.0Amax@220Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	0.75MIU max @277Vac 60Hz, UL8750 0.7mA max @240Vac 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 model
Ripple Current	Ip-p:5%Io max
Setup Time	3s 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℃
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	≥280,000 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	309x 90 x 41.5 by mm (body), 336 x 90 x 41.5 by mm (endcaps included)
Net Weight	2100g
Packing	See Package Information Section in the datasheet

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

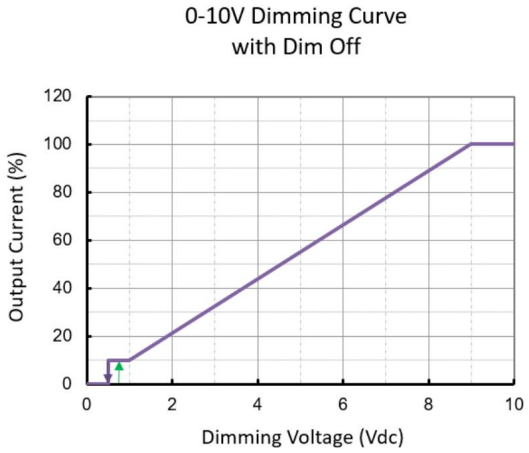
Safety/EMC Compliance

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

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%

- **Dimming Curve**

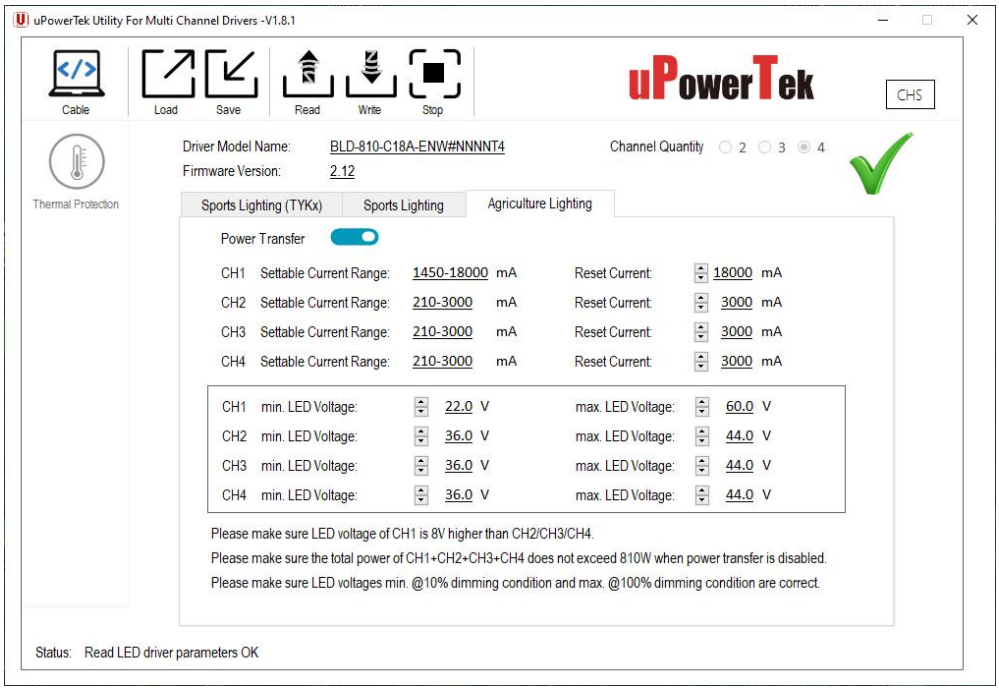


Note: CH1 can not reach the target output current if CH2, CH3 or CH4 is on and P1 +P2+P3+P4>400W.

Programming

- **Programmable Functions**

  uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current and Power Transfer can be set as basic programming functions. Also the software helps the users to verify right LED target operation parameters in the black line frame area.

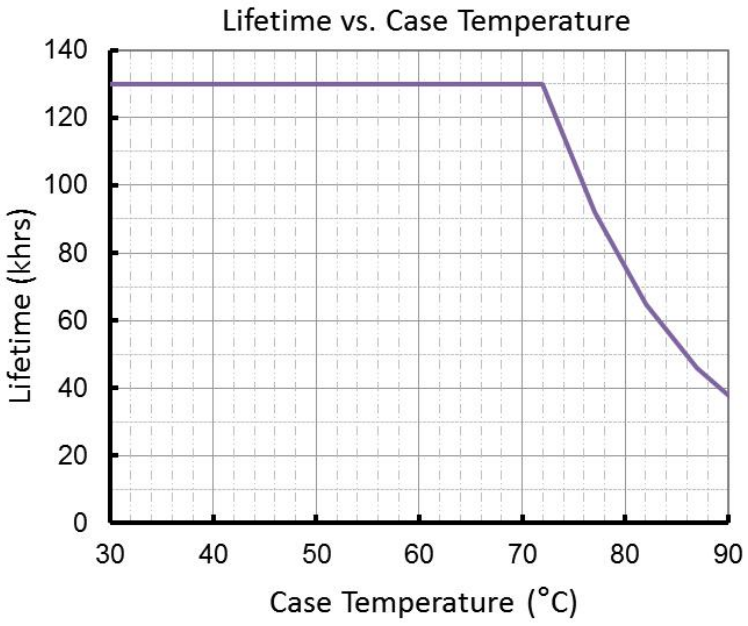


uPowreTek Programming Software Interface

- **Connection Guide**

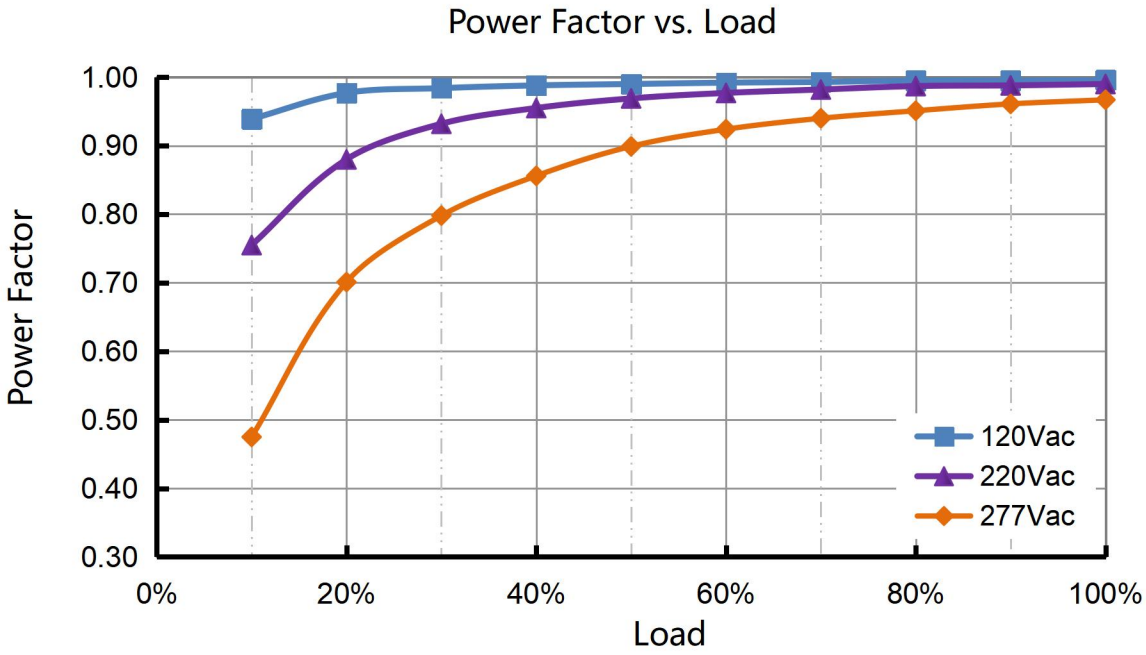
  This guide provides simple connection diagrams to help users understand the programming system. For more detailed operating instructions, including step-by-step procedures and additional configurations, please visit our website. You can download the comprehensive user manual and necessary software from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

Lifetime vs. Case Temperature

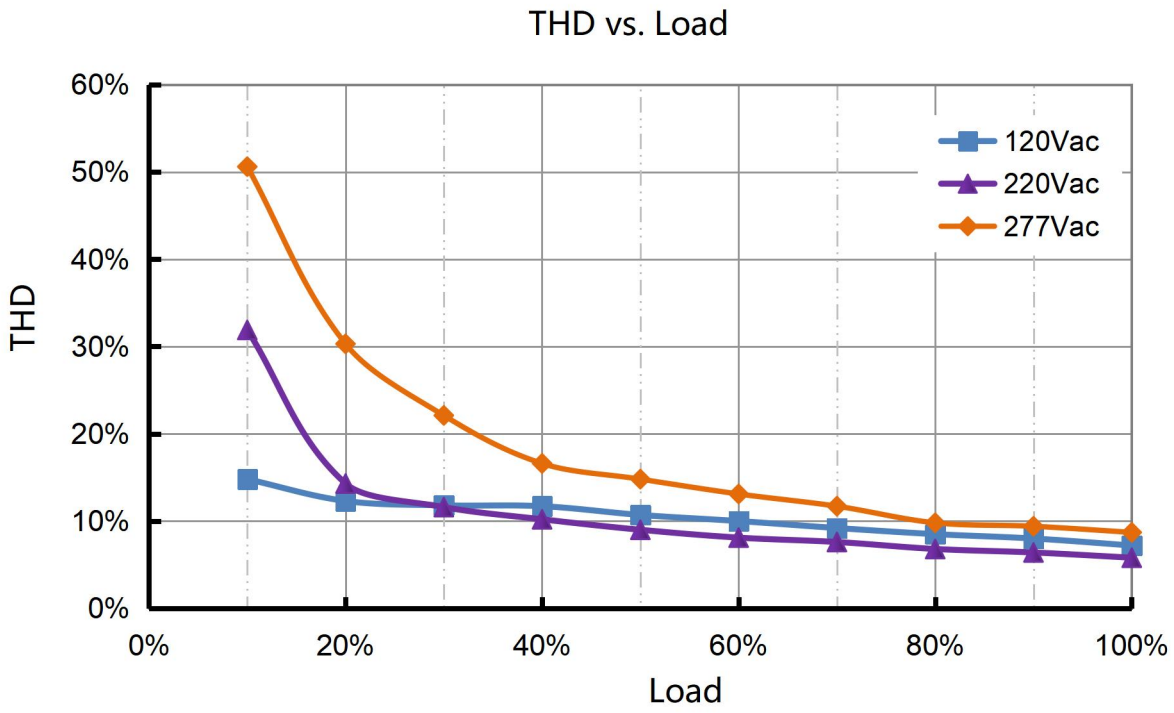


(End of Life: Maximum Failure Rate=10%)

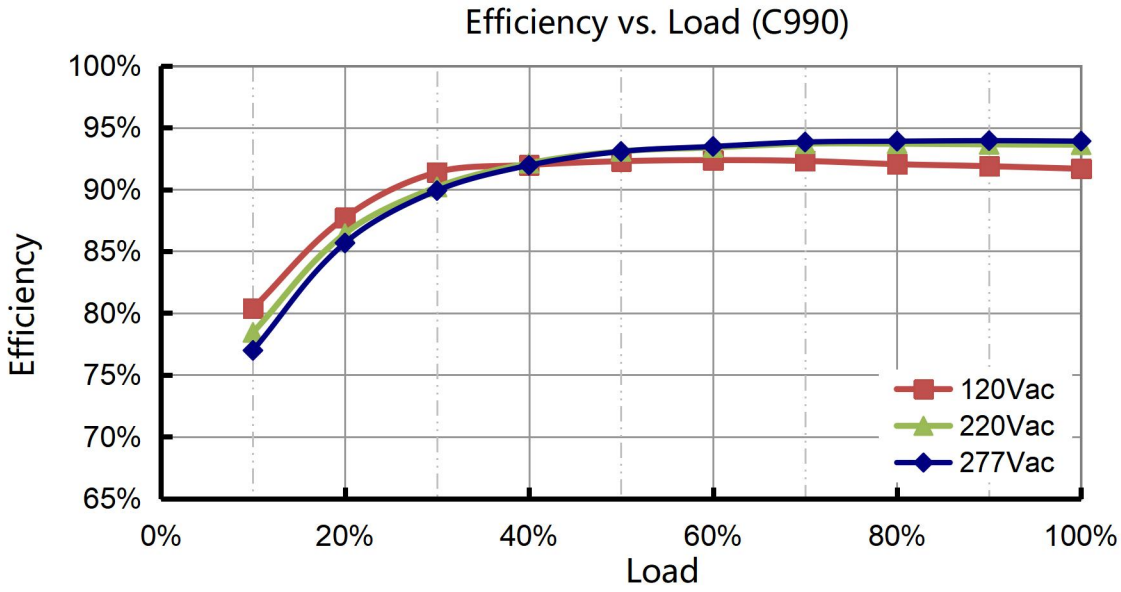
Power Factor vs. Load



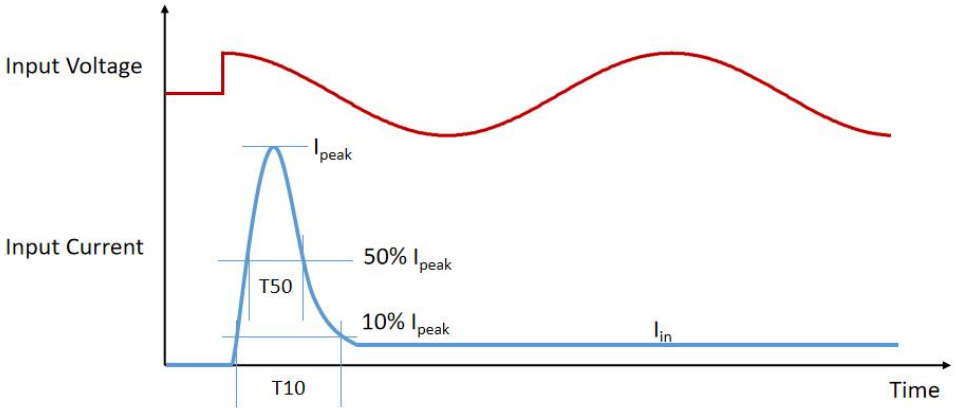
THD vs. Load



Efficiency vs. Load



Inrush Current



Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
120Vac	18.0A	5.32ms	2.1ms
220Vac	30.8A	5.24ms	2ms
277Vac	42.2A	5.08ms	1.9ms

- MCB Suggestion

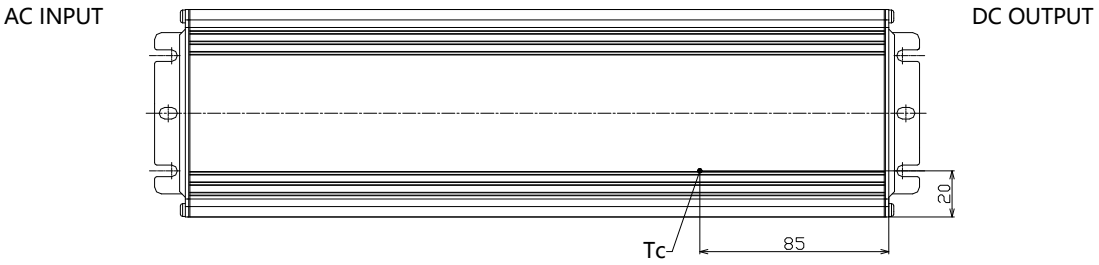
Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
Driver Quantity	1	2	3	4	2	3	5	7	4	6	10	12

Note: Calculated with MCB S200 series manufactured by ABB at 230Vac Input condition

Dielectric Strength

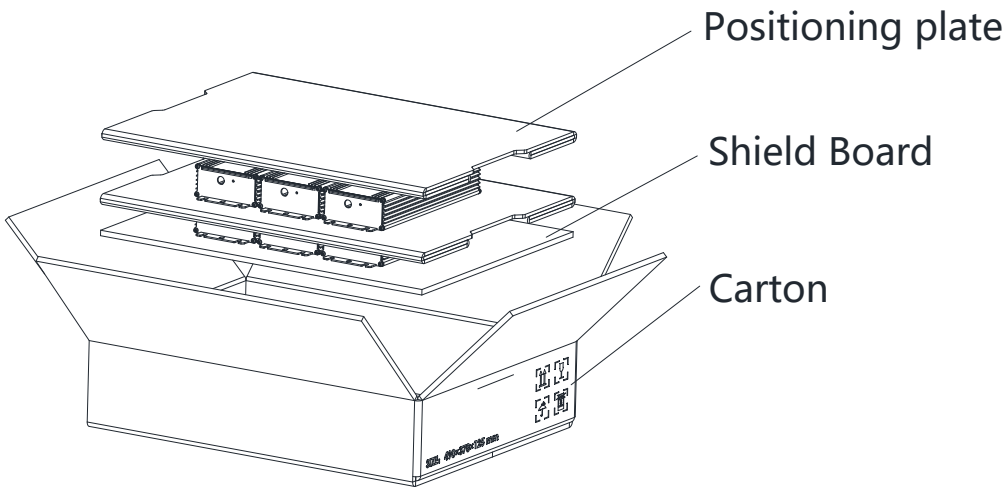
Unit: Vac	Input	Output	Dimming	Case
Input	-	3750	3750	1554
Output	3750	-	1554	1554
Dimming	3750	1554	-	1554
Case	1554	1554	1554	-

Tc Point



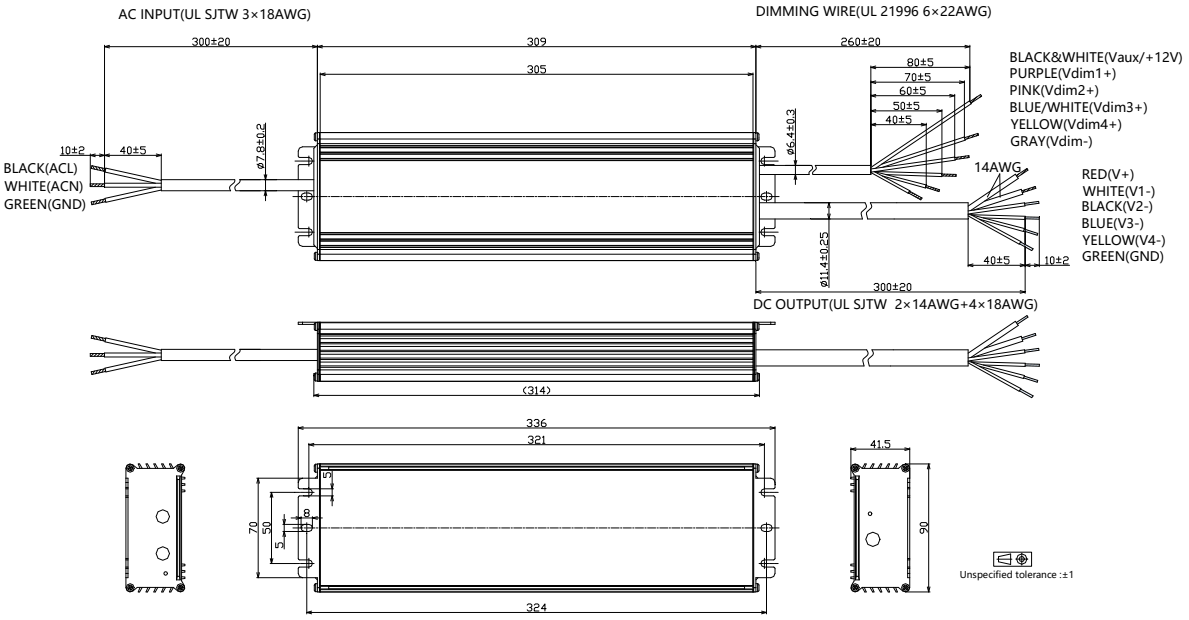
Packaging Information

Typical Carton Dimension(L×W×H)	490×370×125 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	6pcs/carton
Net Weight	9.6 kg/carton
Gross Weight	10.5 kg/carton

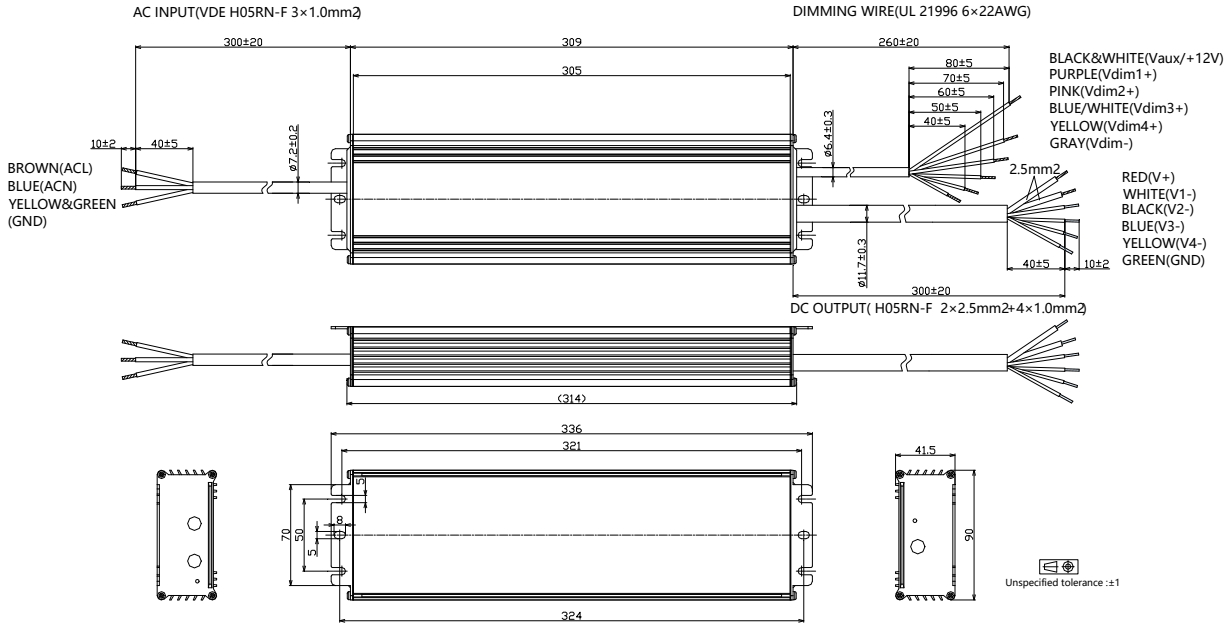


■ Mechanical Design

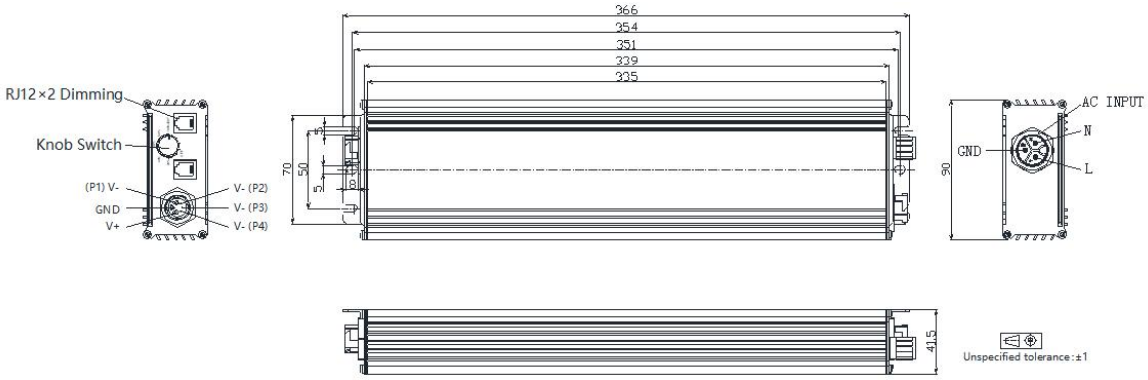
- UL Cable



- VDE Cable



- Customized Endcap Version (Example below, check with uPowerTek sales team about correct data according to different configuration)

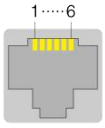


- Add suffix #abcdTS to the end of part number to indicate different configuration.

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 N: Same cable as standard version
Knob	d	K: Knob with steps B: Knob without steps N: No knob

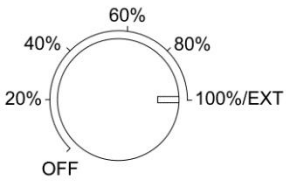
- RJ25 Pin Description (can be customized according to control system)

Pin	Description	Pin	Description
1	CH1 0-10V	4	CH4 0-10V
2	CH2 0-10V	5	12V Aux-power
3	CH3 0-10V	6	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. Using knob control will turn off CH2, 3 and 4, with only CH1 left.



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)
-C990	9900	400	30	40	990
	9600	400	30	42	960
	9300	400	30	43	930
	9000	400	30	44	900
	8700	400	30	46	870
	8400	400	30	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	383	35	58	690
	6300	365	35	58	690
	6000	348	35	58	690
	…	…	…	…	…
	690	48	35	58	690

Revision History

Revision	Date	Contents
A	2022-06-26	New Release
B	2022-09-07	Mechanical Design Update
C	2022-11-09	Output Voltage Range Update
D	2023-04-07	Tc Point, Packaging Information Update
E	2023-07-14	1. Update cable selection table in Model List Section 2. Output range updated
F	2024-07-25	1. Power factor, THD, efficiency curves updated by 10-100% load range 2. MCB usage and driver quantity section added 3. Inrush current data updated