Product Datasheet

The global certified BLD-610-C is an extremely high efficiency smart LED driver for 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 (internal and external by NTC) with auto-recovery secure non-stop operation for luminaires. Customized active daisy chain, master mode and button design greatly ease the design for horticultural usage.

Features

- Absolute Supply Voltage: 100-305Vac or 127-420Vdc, 380Vac for 2 hours
- Horticultural Customized Endcap
- 95% Efficiency Max.
- Low Inrush Current
- Programmable Hot Swap
- Active Daisy Chain and Master Mode
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- NFC or Cable Programmability and Isolated Dimming
- +/-2% Output Current Accuracy
- Isolated 0-10V/PWM/Time/DALI2.0/ DMX/RDM Dimmable
- Dim Off with 0.5W Standby Power
- 12V 300mA Auxiliary Power to Power Controllers and Fans
- UL Class P, ENEC/CB/CCC SELV Output
- Global Certified Model Available
- Safety according to EN 61347-1, 61347-2-3,61347-2-13, 623847

Model List

Model Number	Input Voltage Range	Output Power	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max
BLD-610-C14A-XYZ	100-305Vac	610 W	30-55Vdc	11A	14A
BLD-610-C860-XYZ	100-305Vac	610 W	42-100Vdc	6A	8.6A
BLD-610-C600-XYZ	100-305Vac	610 W	60-143Vdc	4.2A	6A
BLD-610-C420-XYZ	100-305Vac	610 W	86-214Vdc	2.8A	4.2A
BLD-610-C280-XYZ	100-305Vac	610 W	129-286Vdc	2.1A	2.8A
BLD-610-C210-XYZ	100-305Vac	610 W	171-428Vdc	1.4A	2.1A

XY=	Dimming Method	Programmable	12Vaux	Dim-off
NN	-	-	-	-
DN	0-10V/PWM/Time	Cable	-	No Dim-off as default status, programmed to have Dim-off
EN	0-10V/PWM/Time	Cable	300mA	√
TR	Time/Set Current	NFC Wireless	-	-
DR	0-10V/PWM/Time	NFC Wireless	-	No Dim-off as default status, programmed to have Dim-off
ER	0-10V/PWM/Time	NFC Wireless	300mA	√
AR	DALI2.0	NFC Wireless	-	√
MR	DMX512 + RDM	NFC Wireless	-	√

Z=	U	V	S	S#NNNNGL	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	2 pin UL cable without Ground	3 pin UL cable with ground	2 pin VDE cable without ground	2 pin Global cable with ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Certified Input Voltage Range	UL Listed Class P FCC 120-277Vac	UL Listed Class P FCC 120-277Vac	ENEC CB RCM CCC Class I 220-277Vac	UL Recognized 120-277Vac ENEC CB RCM Class I 220-277Vac	ENEC CB RCM Class I 220-277Vac	Class II 120-277Vac

Technical Data

Input Voltage	108-305Vac or 127-420Vdc, 380Vac for 2 hours
Input Frequency	47～63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<15%@70-100%load, refer to THD vs. Load curve
Input Current	5.4Amax@120Vac & Full-Load, 2.4Amax@277Vac & 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, ±5%Io for non-programmable model
Ripple Current	Ip-p:5%Io max
Setup Time	2.1s 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
Dimensions (Standard)	13.22x3.54x1.63 by inch (body), 14.29x3.54x1.63 by inch (endcaps included)
	336x 90 x 41.5 by mm (body), 363 x 90 x 41.5 by mm (endcaps included)
Net Weight	2600g
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

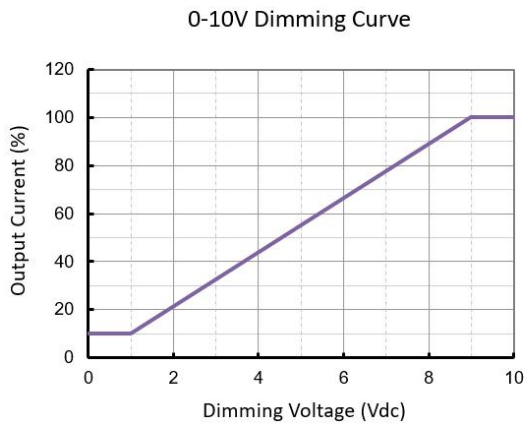
Dimming

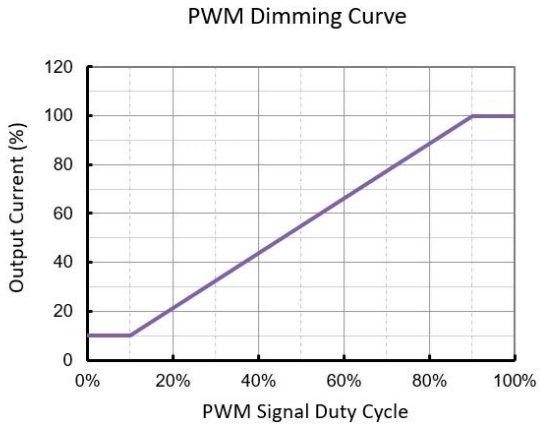
Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
PWM Dimming Range	10% (Duty=10%)	Linear	100% (Duty=90-100%)
Default Dim off Threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Default Dim off Threshold	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[1] On-Off Transition		300ms	
Fast Dimming 10-100% Io Transition		70ms	

Notes [1]: Fast dimming feature is only available by models with -FD0000 suffix.

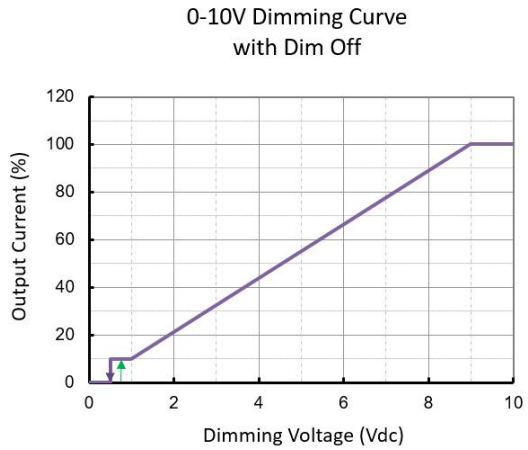
- **Default Dimming Curves**

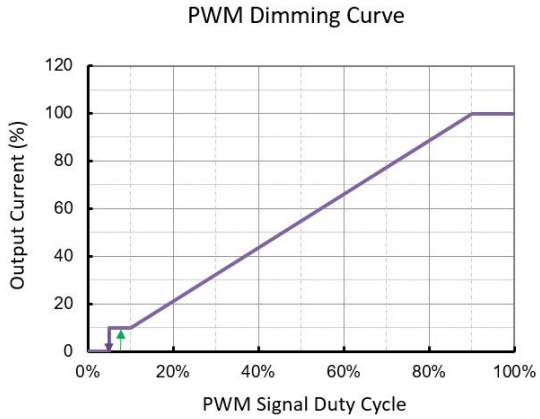
a. 0-10V dimming without dim-off



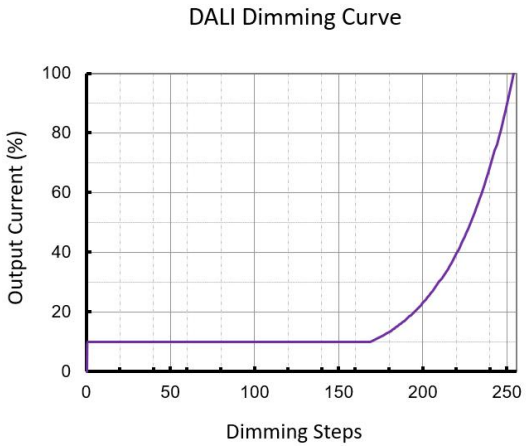


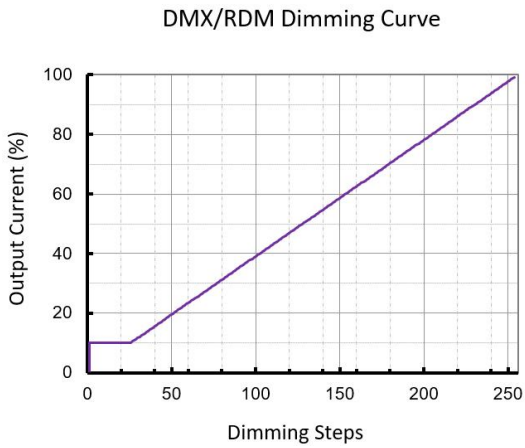
b. 0-10V dimming with dim-off





c. DALI and DMX dimming curves



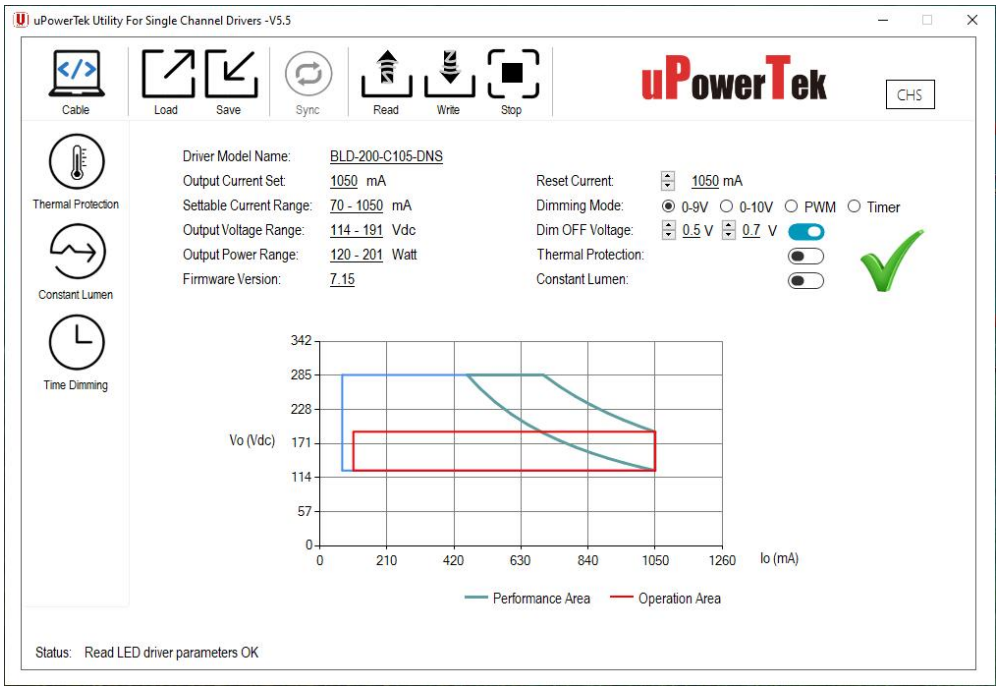


Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

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

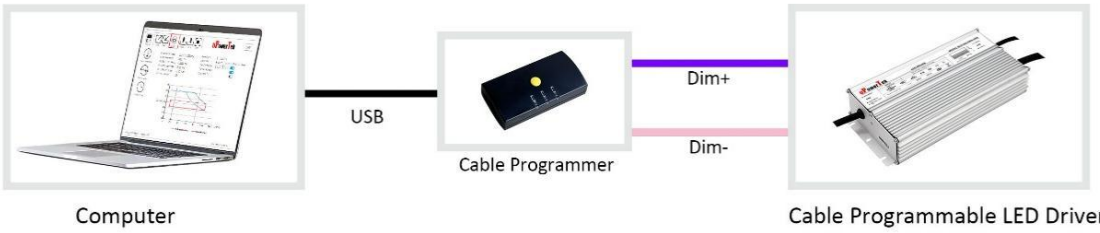
NFC Programmer V2

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/.

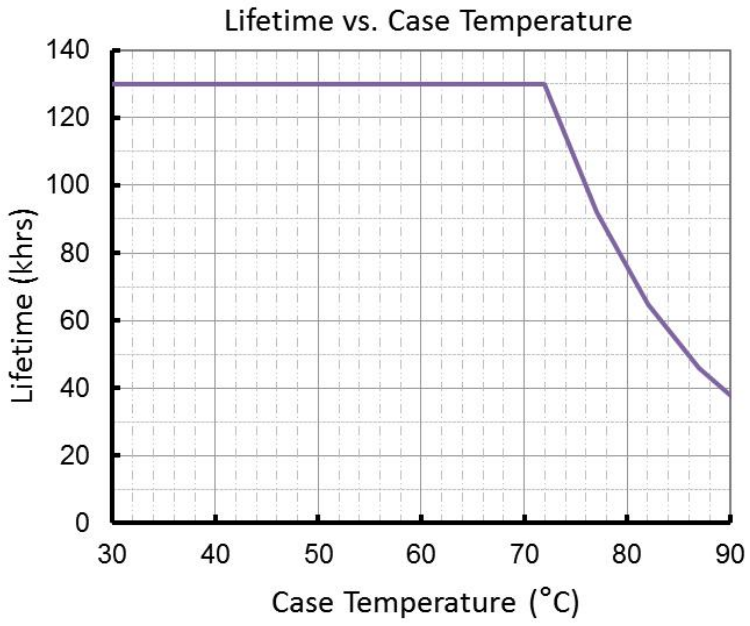


Wired Programming

Wireless Programming

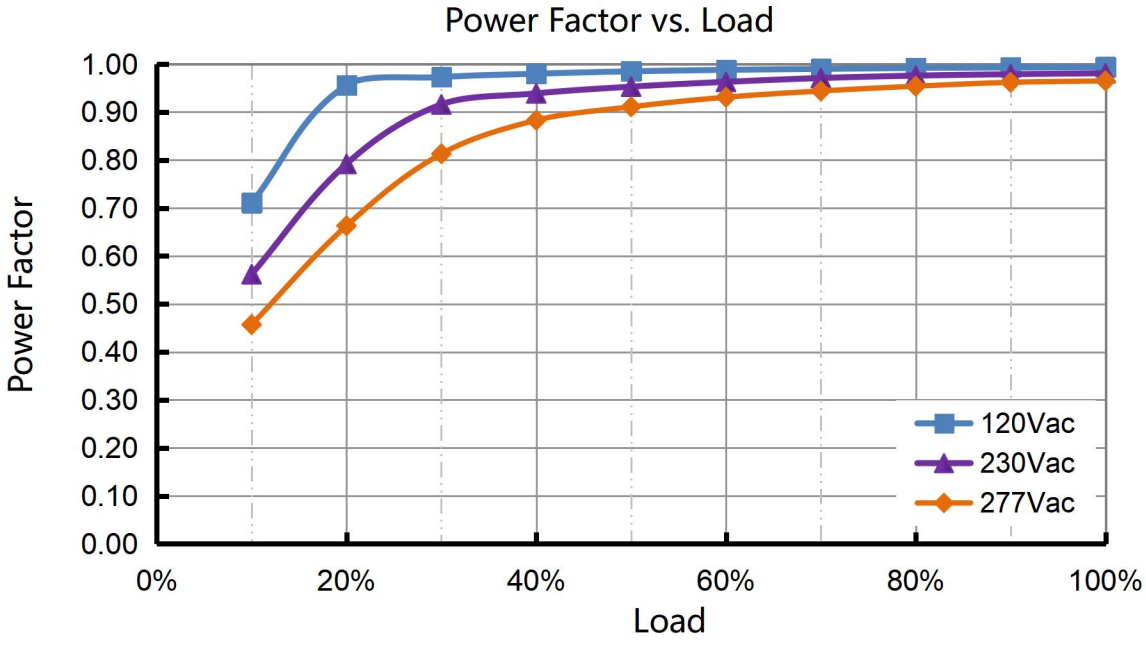
Cellphone Programming

Lifetime vs. Case Temperature

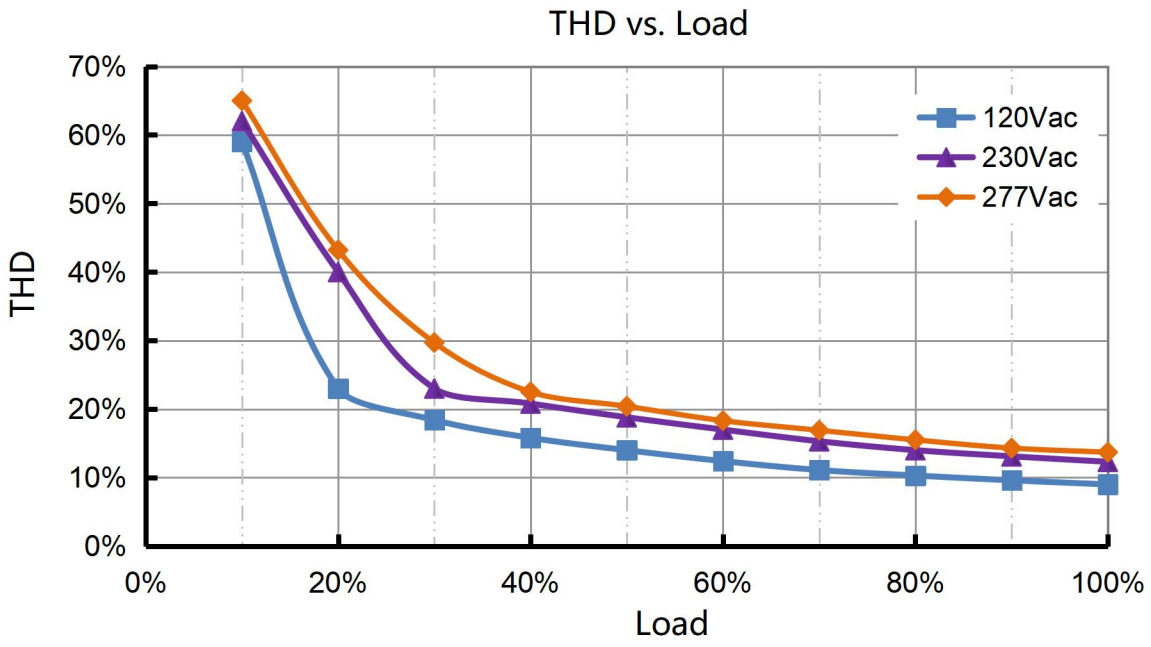


(End of Life: Maximum Failure Rate=10%)

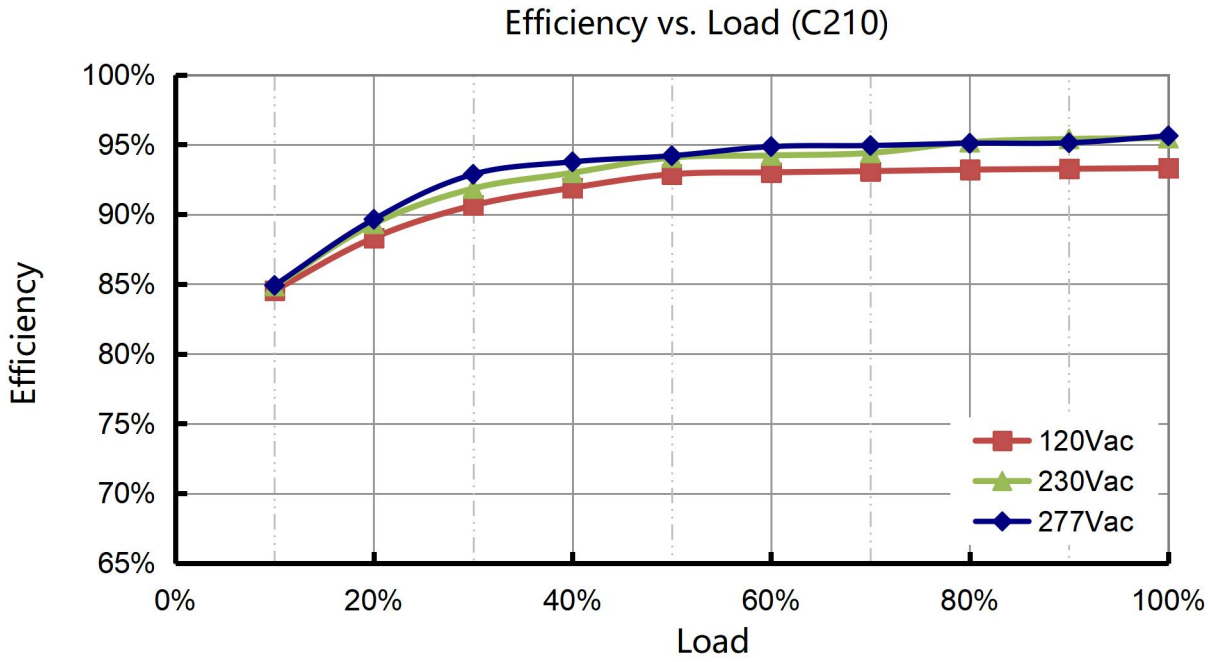
Power Factor vs. Load

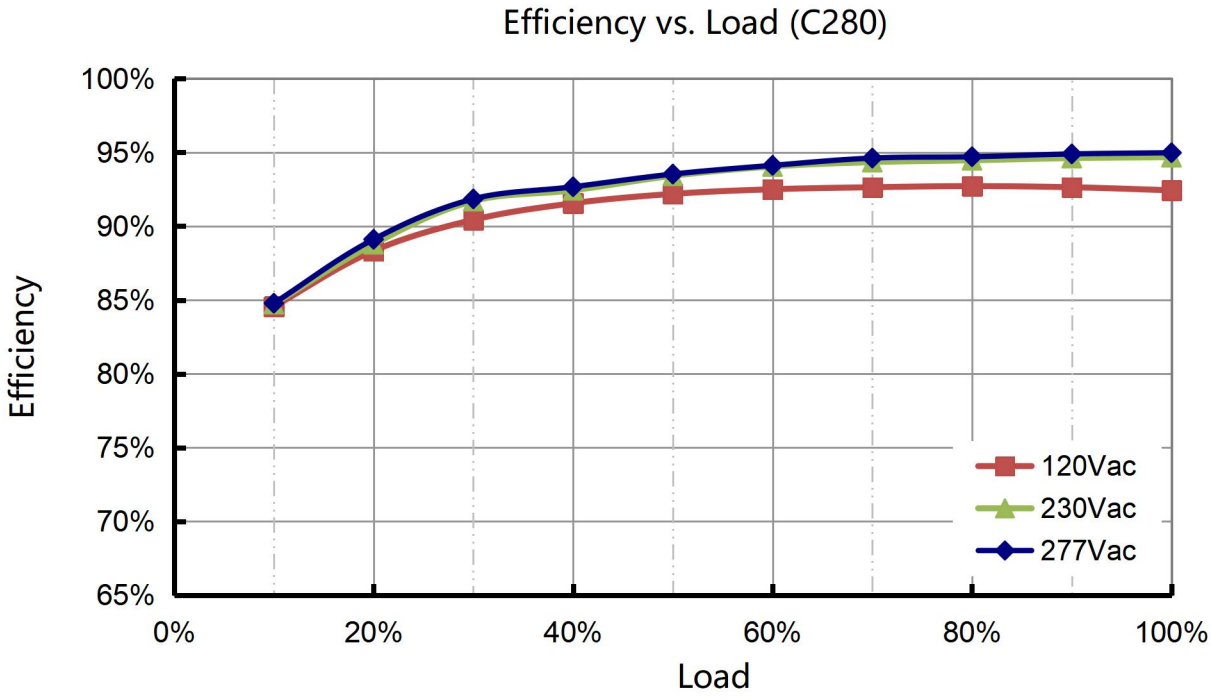


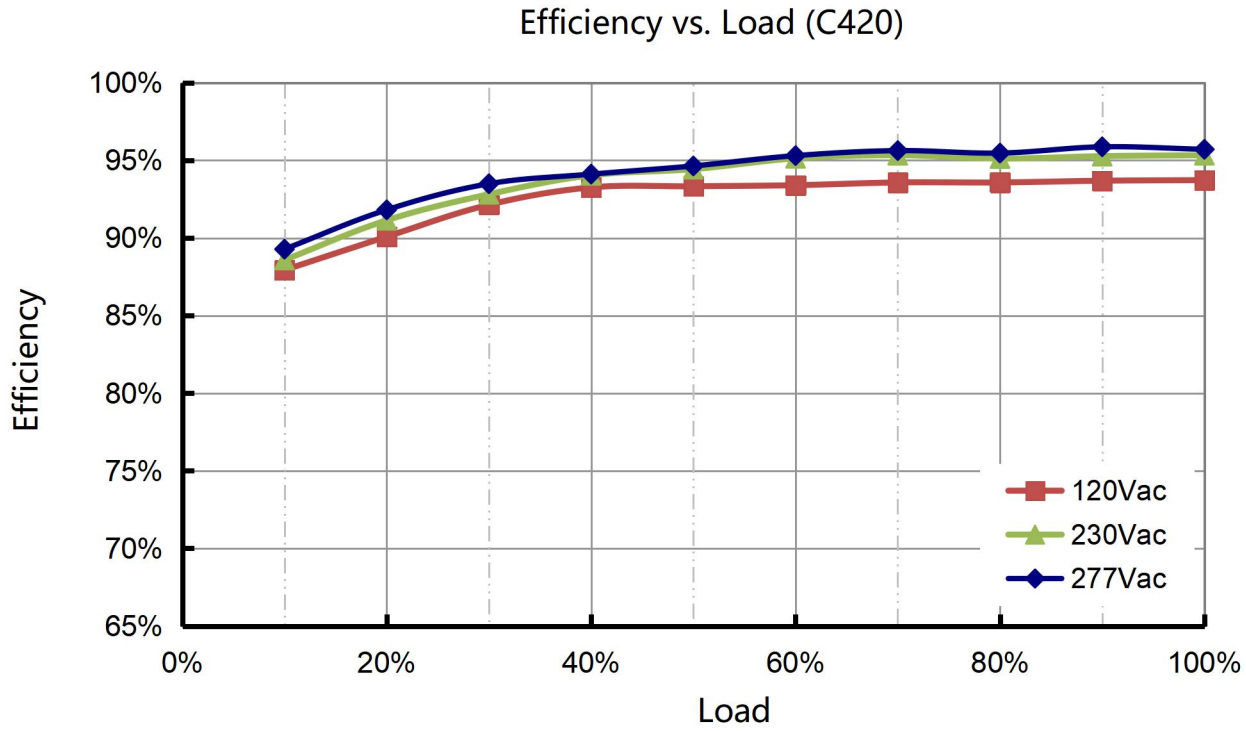
THD vs. Load

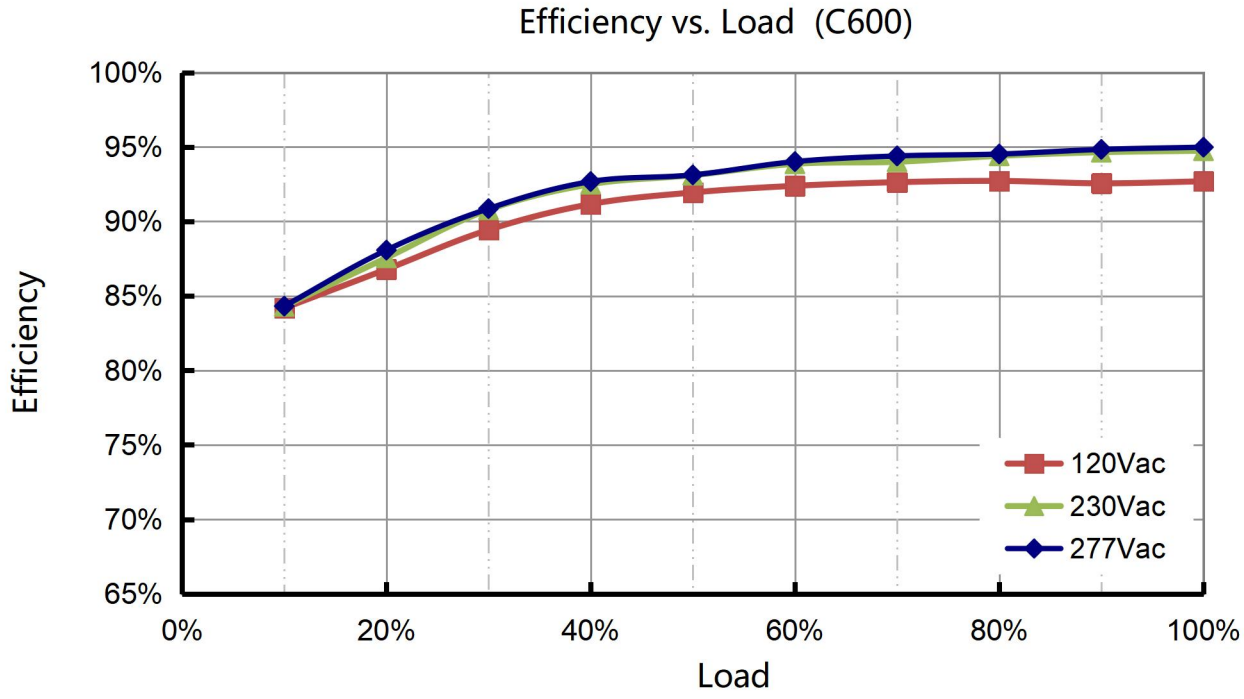


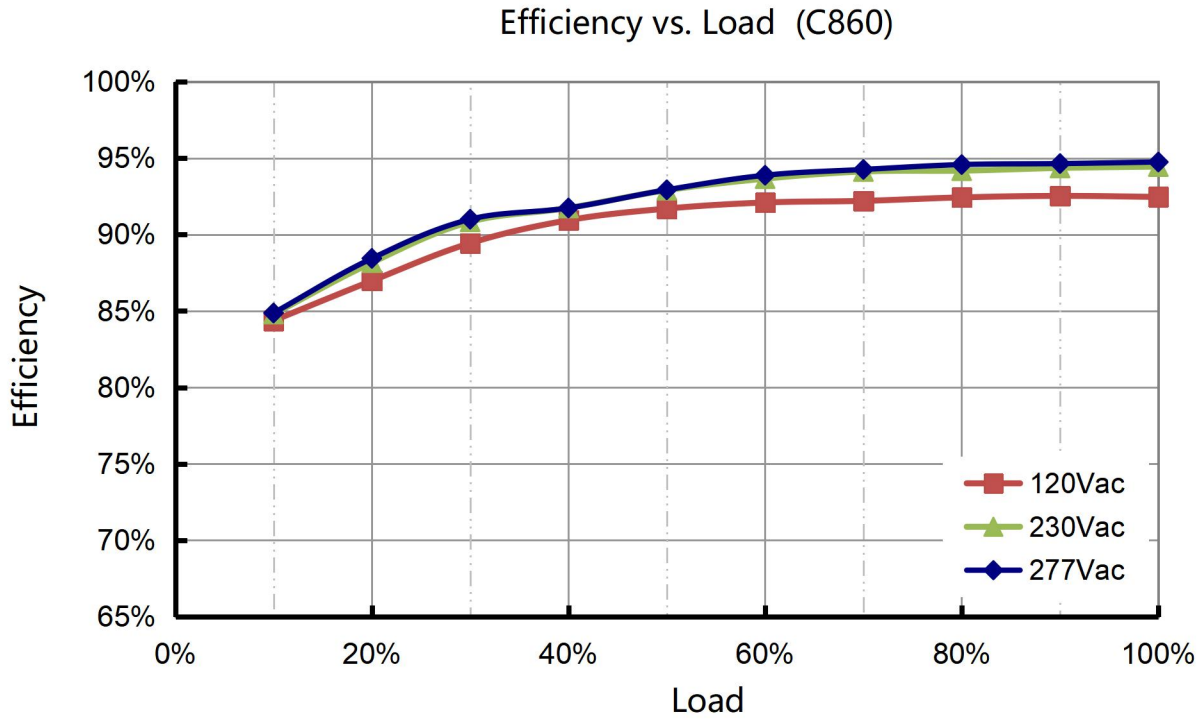
Efficiency vs. Load

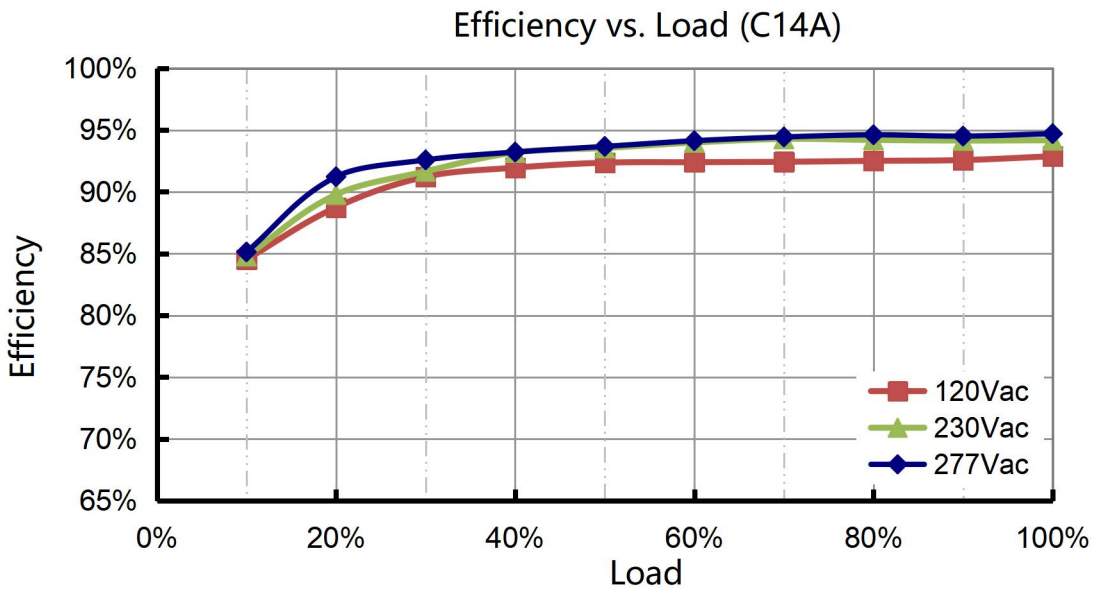



Efficiency vs. Load (C280)
Efficiency
100%
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
120Vac
230Vac
277Vac

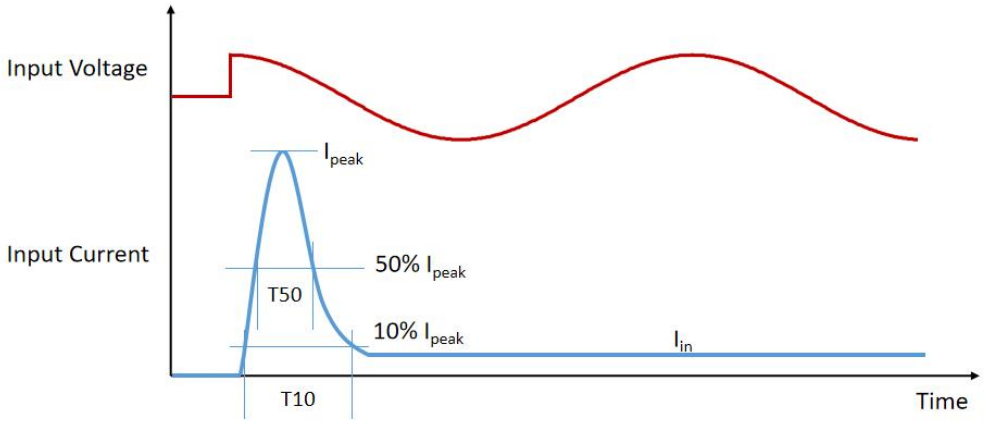

Efficiency vs. Load (C420)
Efficiency
100%
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
120Vac
230Vac
277Vac


Efficiency vs. Load (C600)
Efficiency
100%
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
120Vac
230Vac
277Vac


Efficiency vs. Load (C860)
Efficiency
100%
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
120Vac
230Vac
277Vac



Inrush Current



Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
120Vac	3A	67ms	16ms
220Vac	5A	70ms	17ms
277Vac	8A	70ms	17ms

- **MCB Suggestion**

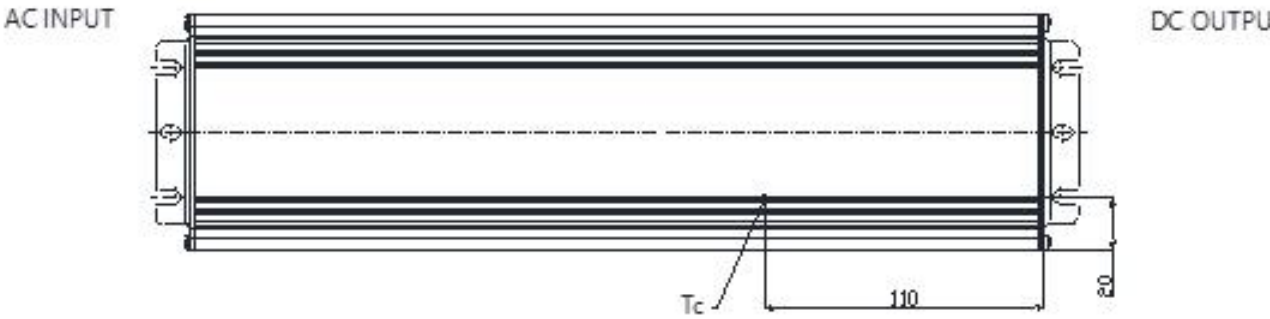
Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
Driver Quantity	2	3	5	6	2	3	6	7	2	4	6	8

Note: Calculated with MCB S200 series manufactured by ABB at 220Vac Input condition

Dielectric Strength

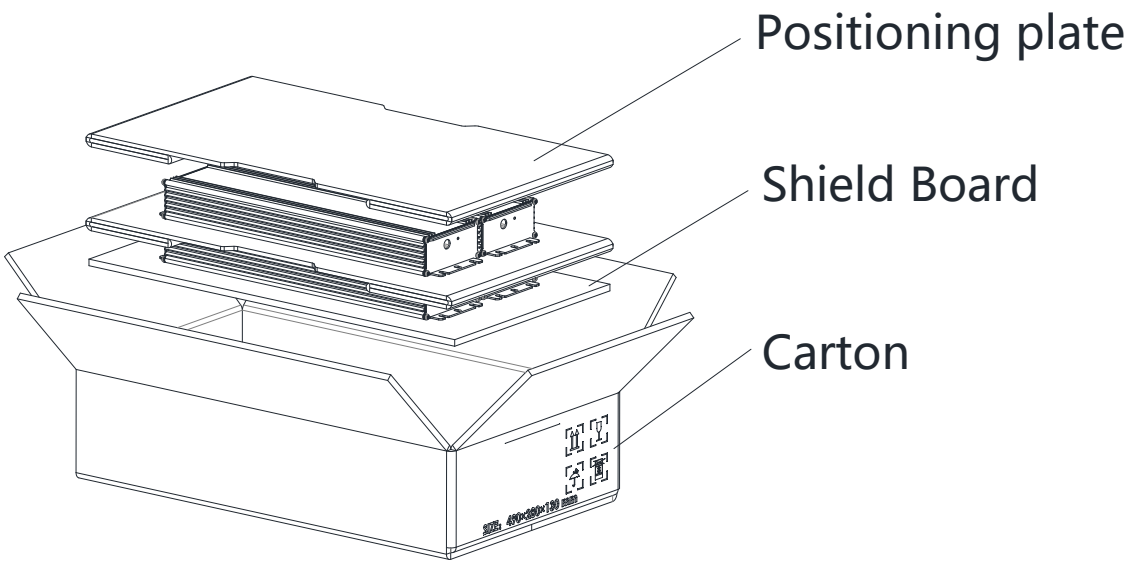
Unit: Vac	Input	Output	Dimming	Case
Input	-	3750	3750	1554
Output	3750	-	1554	1554
Dimming	3750	1554	-	1554
Case	1554	1554	1554	-

Tc Point



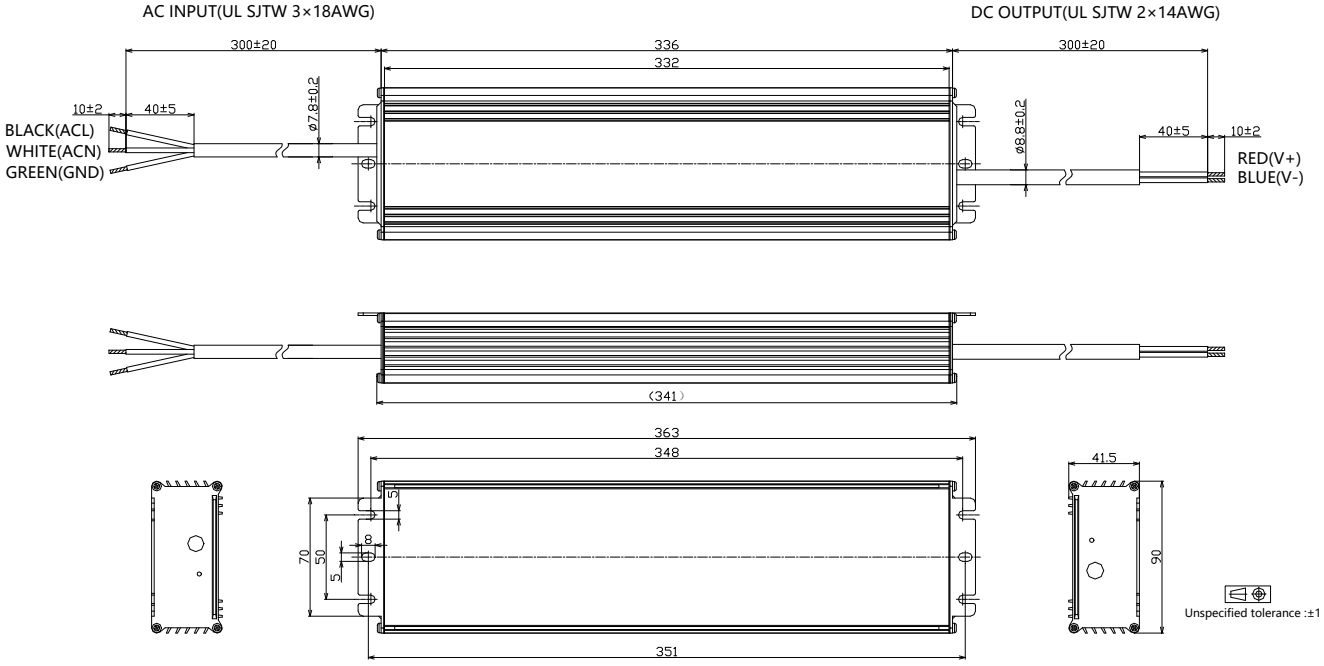
Packaging Information

Typical Carton Dimension(L×W×H)	490×280×130 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	4pcs/carton
Net Weight	9.6kg/carton
Gross Weight	10.2 kg/carton

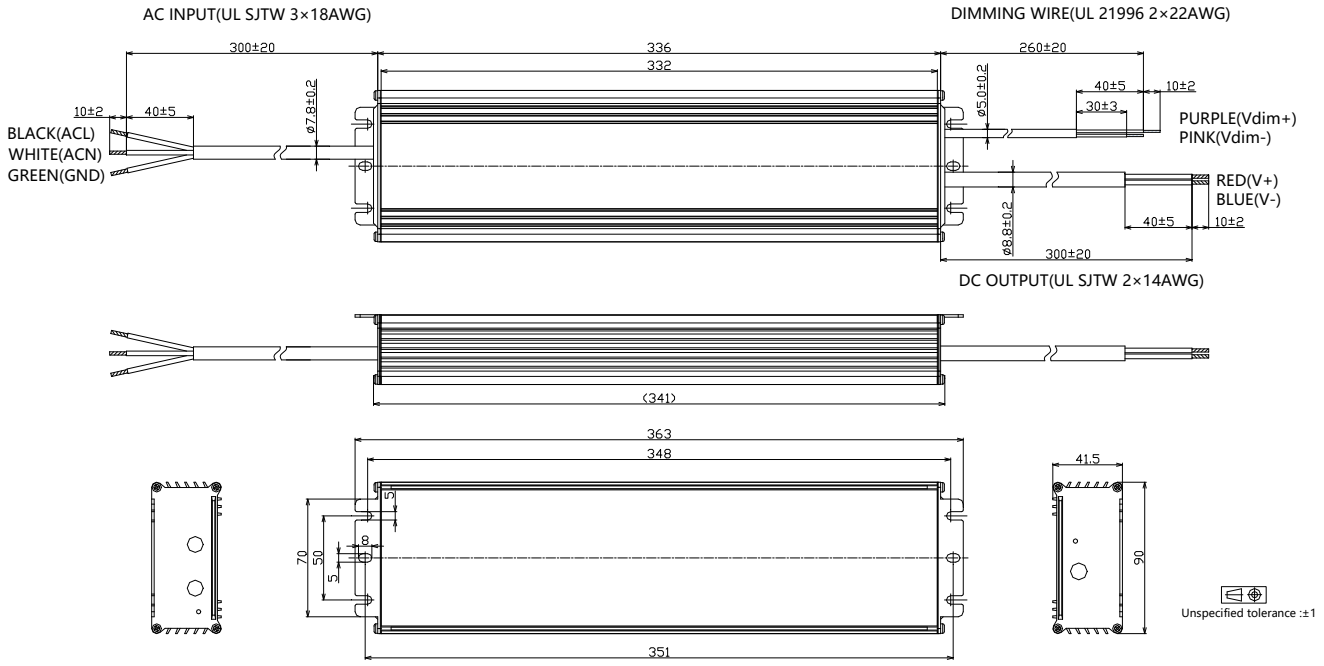


Mechanical Design

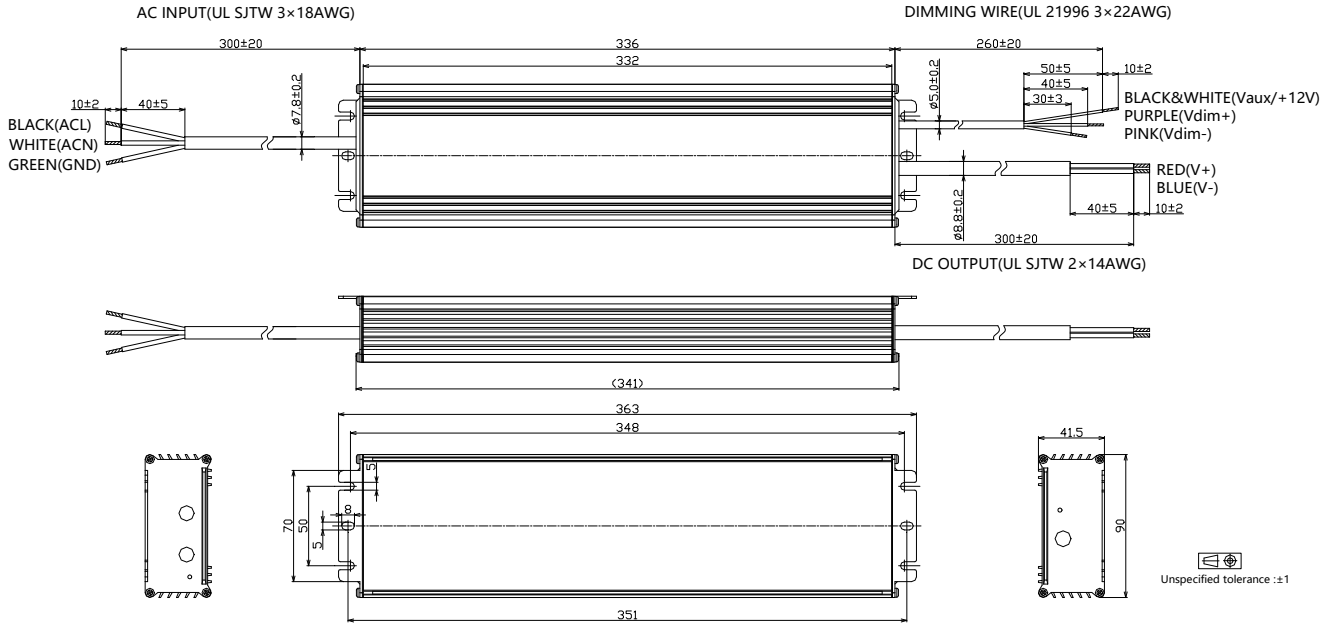
- BLD-610-Cxxx-NN/TRU (UL Cable)



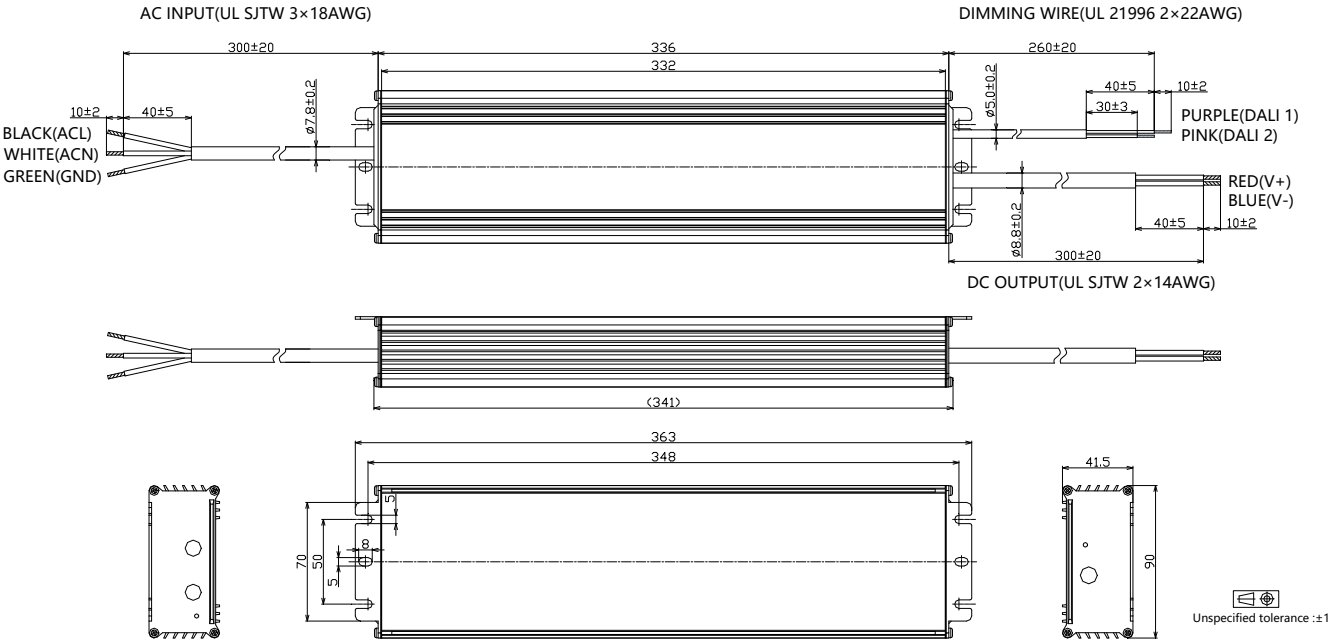
- BLD-610-Cxxx-DN/DRU (UL Cable)



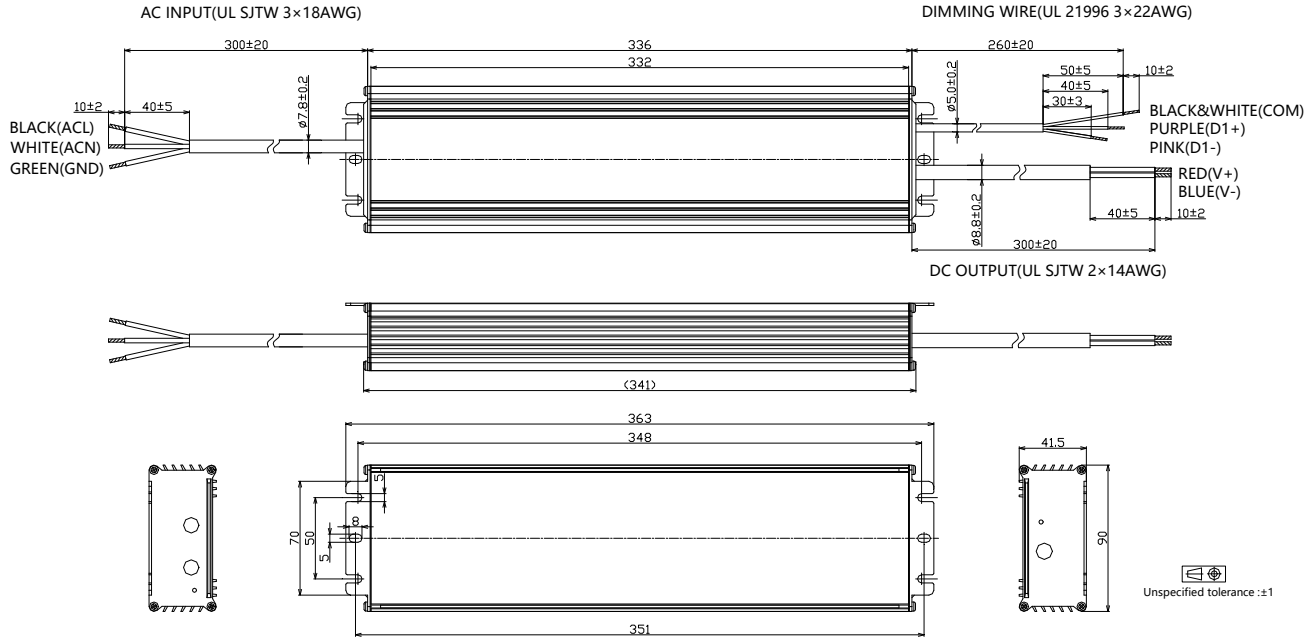
- BLD-610-Cxxx-EN/ERU (UL Cable)



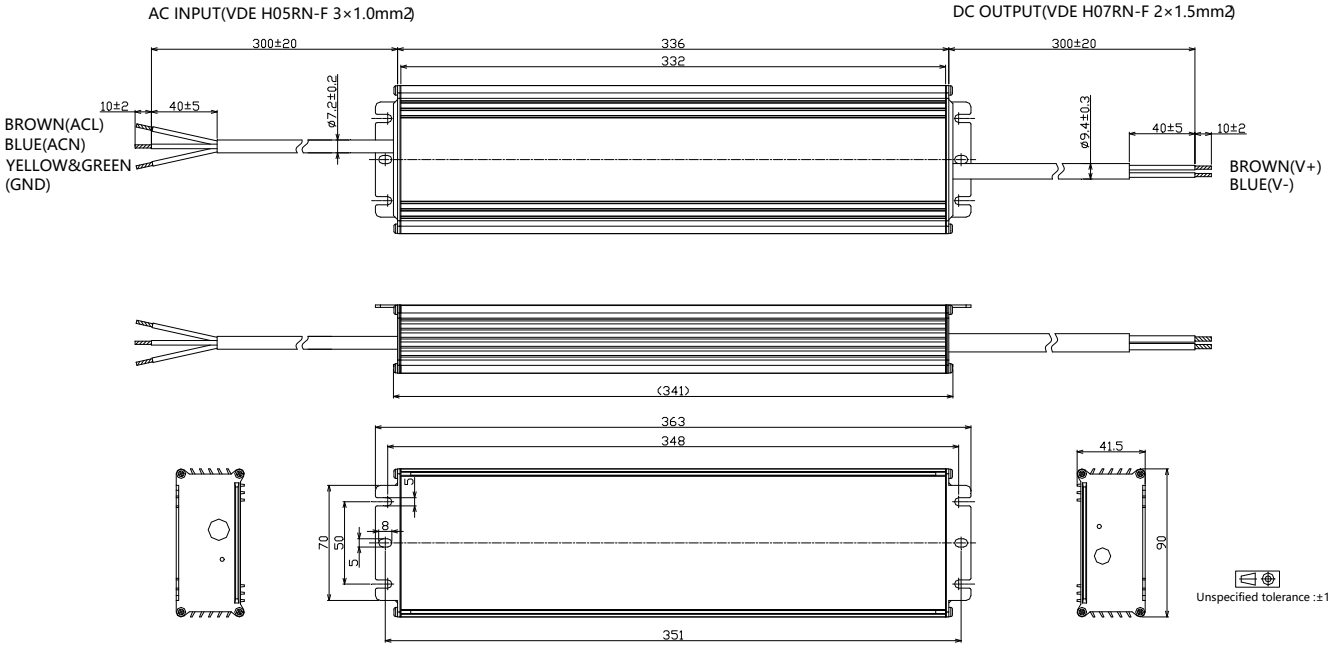
- BLD-610-Cxxx-ARU (UL Cable)



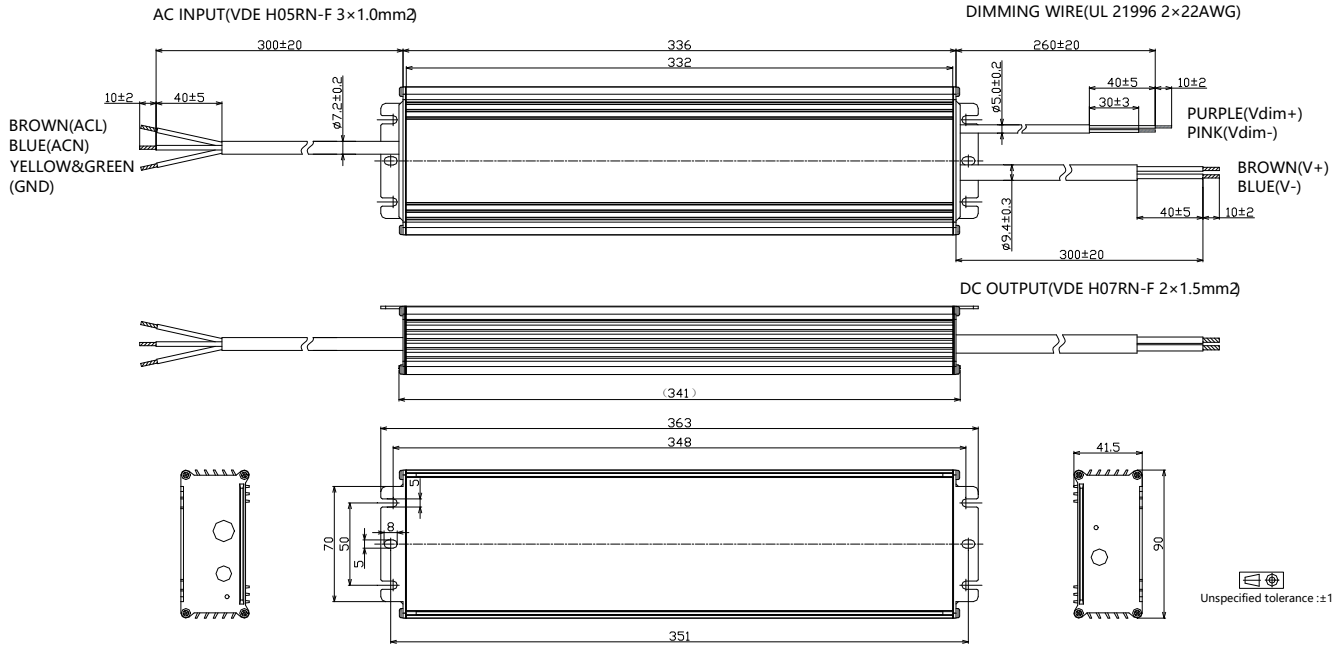
- BLD-610-Cxxx-MRU (UL Cable)



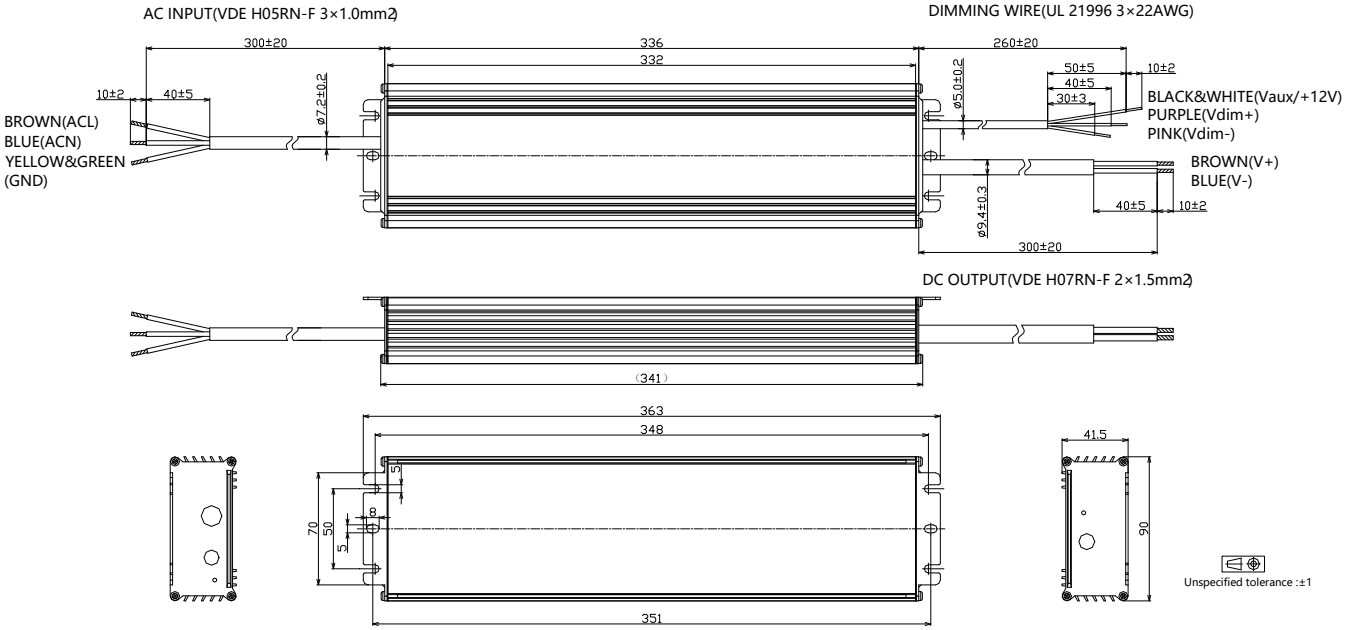
- BLD-610-Cxxx-NN/TRS (VDE CABLE, MODELS WITH HIGHER THAN 60V OUTPUT VOLTAGE)



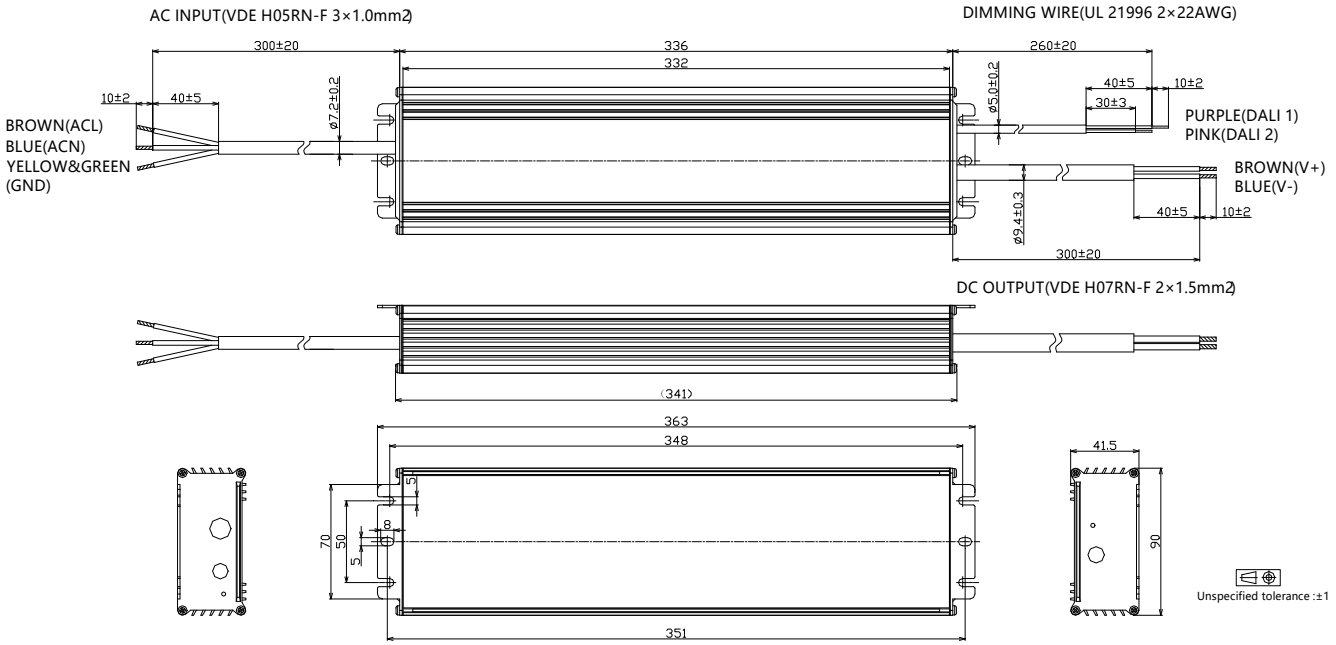
- BLD-610-Cxxx-DN/DRS (VDE CABLE, MODELS WITH HIGHER THAN 60V OUTPUT VOLTAGE)



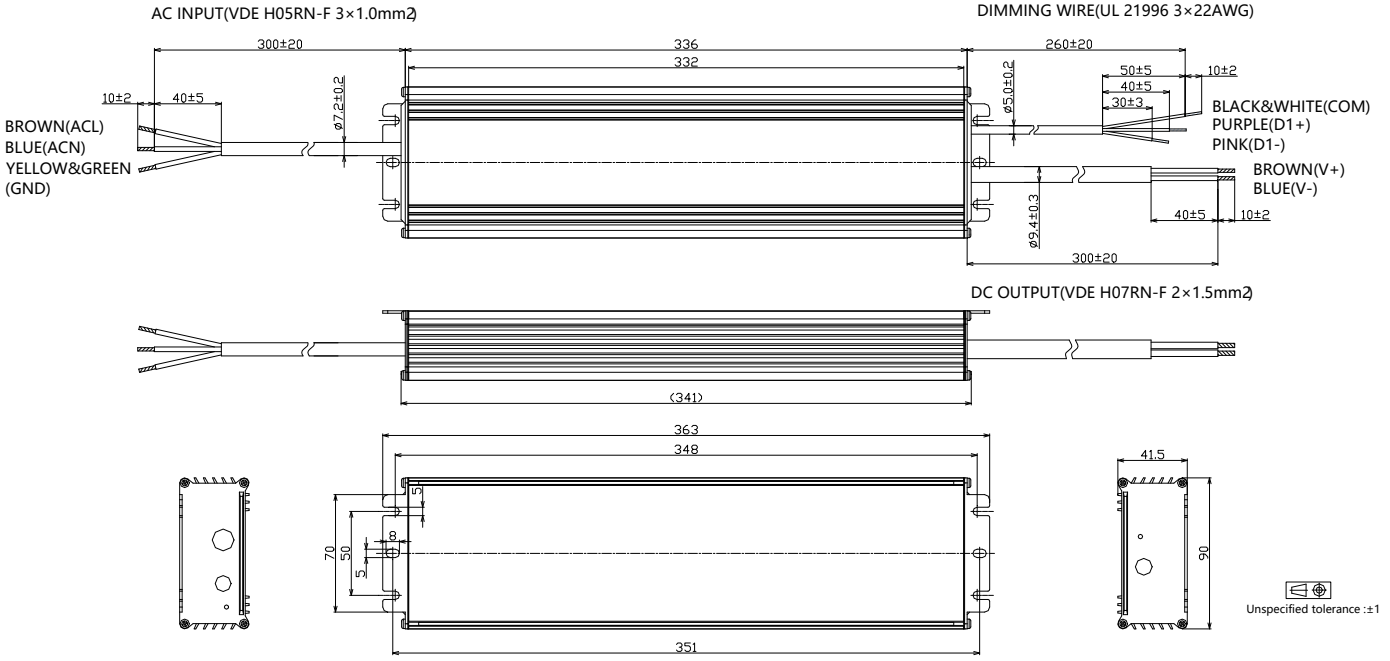
- BLD-610-Cxxx-EN/ERS (VDE CABLE, MODELS WITH HIGHER THAN 60V OUTPUT VOLTAGE)



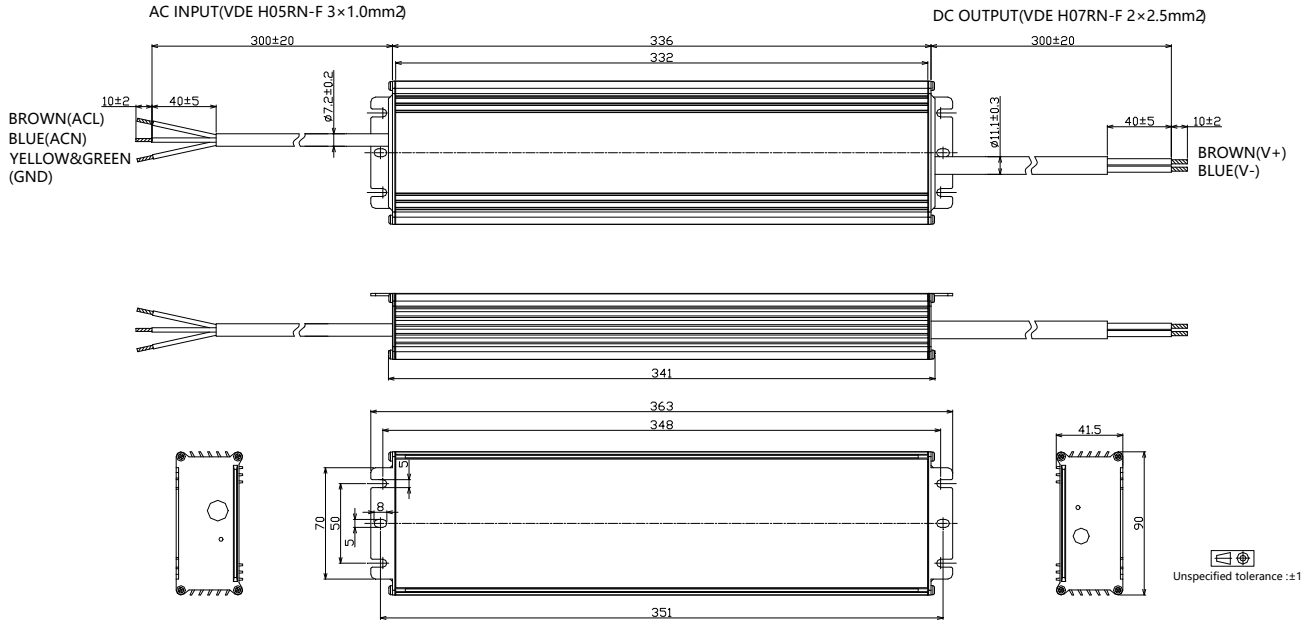
- BLD-610-Cxxx-ARS (VDE CABLE, MODELS WITH HIGHER THAN 60V OUTPUT VOLTAGE)



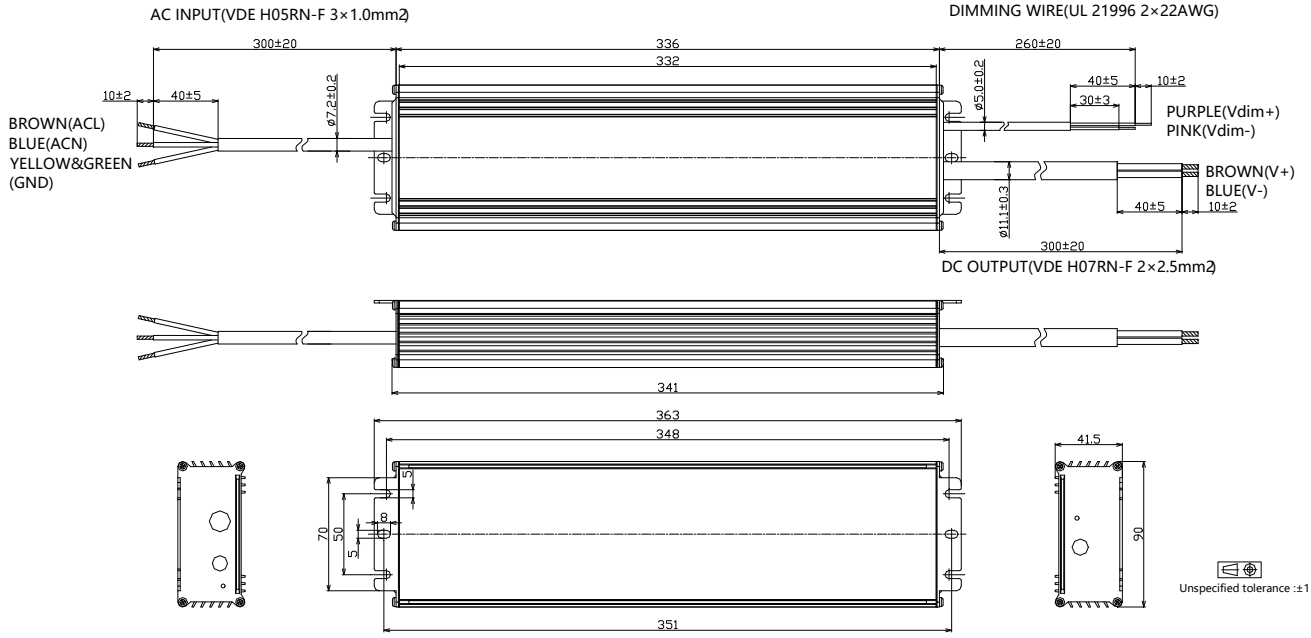
- BLD-610-Cxxx-MRS (VDE CABLE, MODELS WITH HIGHER THAN 60V OUTPUT VOLTAGE)



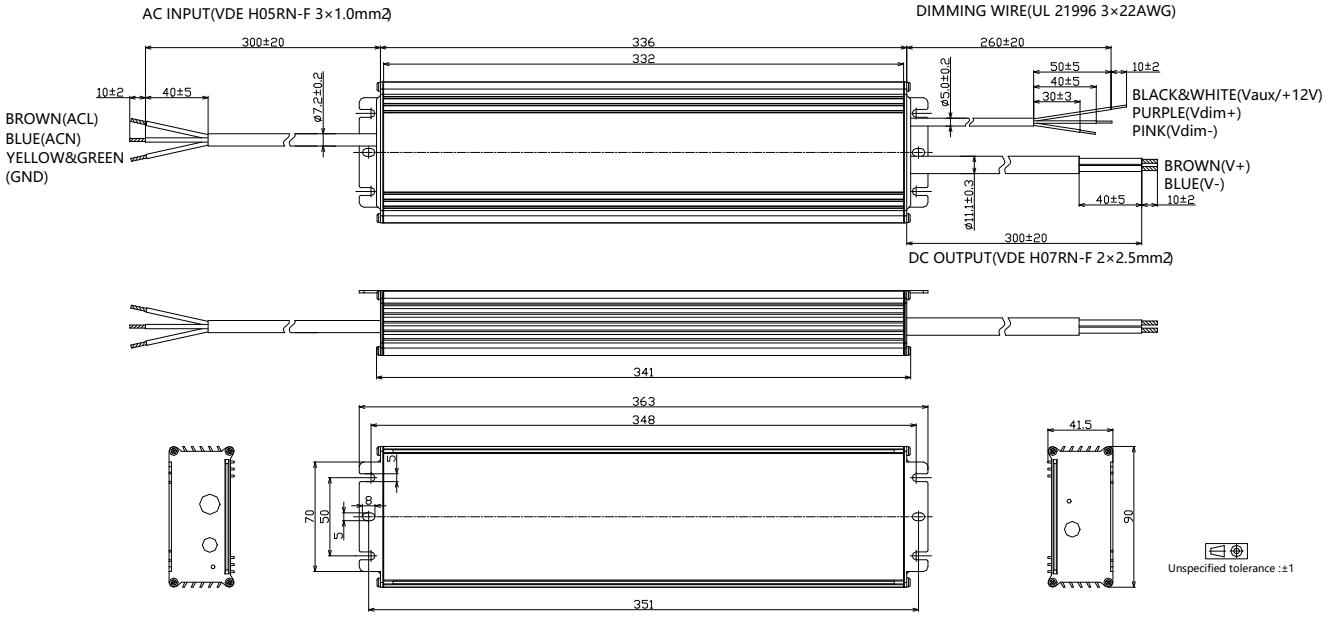
- BLD-610-Cxxx-NN/TRS (VDE CABLE, MODELS WITH LESS THAN 60V OUTPUT VOLTAGE)



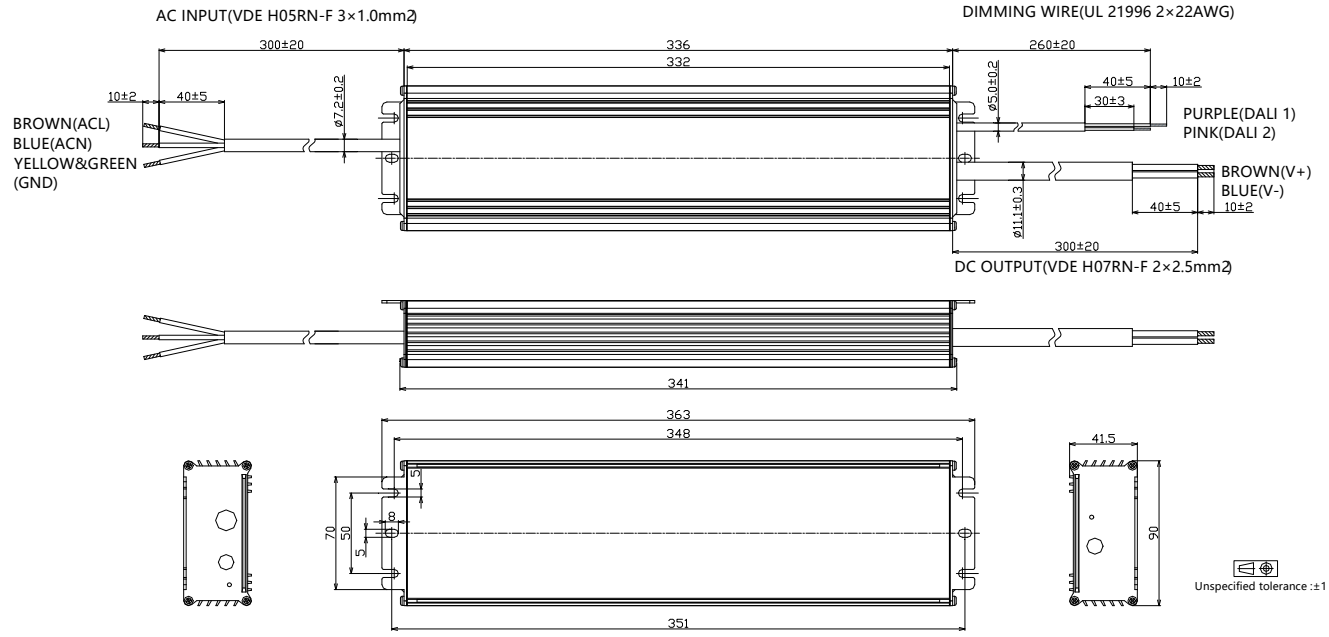
- BLD-610-Cxxx-DN/DRS (VDE CABLE, MODELS WITH LESS THAN 60V OUTPUT VOLTAGE)



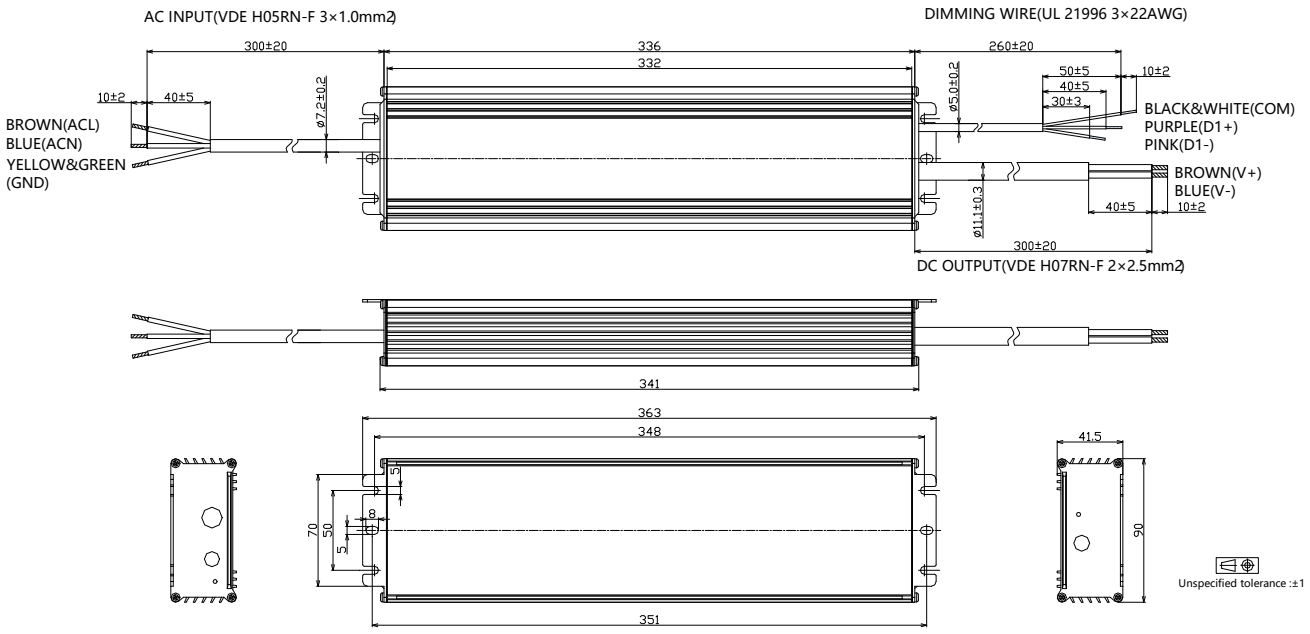
- BLD-610-Cxxx-EN/ERS (VDE CABLE, MODELS WITH LESS THAN 60V OUTPUT VOLTAGE)



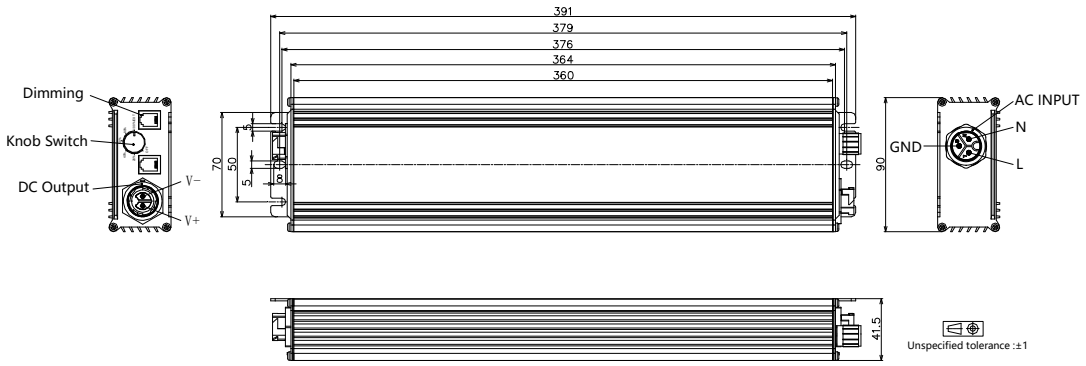
- BLD-610-Cxxx-ARS (VDE CABLE, MODELS WITH LESS THAN 60V OUTPUT VOLTAGE)



- BLD-610-Cxxx-MRS (VDE CABLE, MODELS WITH LESS THAN 60V OUTPUT VOLTAGE)



- Customized Functional End Cap Version

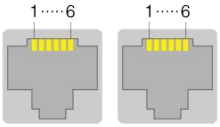


- Add suffix #abcd00 to the end of part number to indicate different configuration. Please refer to product application note AN06 or contact with us for more like **active daisy chain, master mode and button dimming** etc.

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

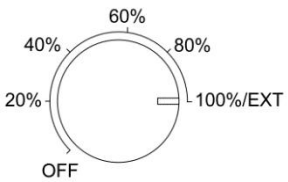
- RJ25 Pin Description (can be customized according to control system)

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)
-C14A	14000	610	30	44	1400
	13000	610	30	47	1300
	12500	610	30	49	1250
	12000	610	31	51	1200
	11500	610	32	53	1150
	11000	610	33	55	1100
	10500	578	33	55	1100
	10000	550	33	55	1100
	…	…	…	…	…
	1100	61	33	55	1100

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C860	8600	610	42	70	860
	8500	610	42	71	850
	8400	610	43	71	840
	8200	610	44	73	820
	8000	610	45	75	800
	7800	610	46	77	780
	7600	610	47	79	760
	7400	610	49	81	740
	7200	610	50	83	720
	7000	610	51	86	700
	6800	610	53	88	680
	6600	610	55	91	660
	6400	610	56	94	640
	6200	610	58	97	620
	6000	610	60	100	600
	5800	580	60	100	600
	5600	560	60	100	600
	…	…	…	…	…
	600	60	60	100	600

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C600	6000	610	60	100	600
	5800	610	62	103	580
	5600	610	64	107	560
	5400	610	67	111	540
	5200	610	69	115	520
	5000	610	72	120	500
	4800	610	75	125	480
	4600	610	78	130	460
	4400	610	82	136	440
	4200	610	86	143	420
	4000	571	86	143	420
	3800	543	86	143	420
	3600	514	86	143	420
	3400	486	86	143	420
	3200	457	86	143	420
	3000	429	86	143	420
	…	…	…	…	…
	420	60	86	143	420

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C420	4200	610	86	143	420
	4100	610	88	146	410
	4000	610	90	150	400
	3900	610	92	154	390
	3800	610	95	158	380
	3700	610	97	162	370
	3600	610	100	167	360
	3500	610	103	171	350
	3300	610	109	182	330
	3200	610	113	188	320
	3100	610	116	194	310
	3000	610	120	200	300
	2900	610	124	207	290
	2800	610	129	214	280
	2700	579	129	214	280
	2600	557	129	214	280
	…	…	…	…	…
	280	60	129	214	280

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C280	2800	610	129	214	280
	2700	610	133	222	270
	2600	610	138	231	260
	2500	610	144	240	250
	2400	610	150	250	240
	2300	610	157	261	230
	2200	610	164	273	220
	2100	610	171	286	210
	2000	571	171	286	210
	1900	543	171	286	210
	1800	514	171	286	210
	1700	486	171	286	210
	…	…	…	…	…
	210	60	171	286	210

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C210	2100	610	171	286	210
	2000	610	180	300	200
	1900	610	189	316	190
	1800	610	200	333	180
	1700	610	212	353	170
	1600	610	225	375	160
	1500	610	240	400	150
	1400	610	257	429	140
	1300	557	257	429	140
	1200	514	257	429	140
	1100	471	257	429	140
	1000	429	257	429	140
	…	…	…	…	…
	140	60	257	429	140

Revision History

Revision	Date	Contents
E	2022-03-22	1. Index page added 2. Reduced dimming interface sourcing current 3. DALI 2.0 compatibility added 4. Programming instruction added 5. Inrush current data added 6. Tc point position indication added 7. Dielectric strength level added 8. Packaging information added 9. Mechanical design change with dimming cable color 10. Revision history added
F	2022-05-28	1. Model C280, C210 added.
G	2022-12-14	1. DMX dimmable models mechanical design updated
H	2023-07-14	1. Update cable selection table in Model List Section
I	2023-09-15	1. Update model selection table with -DN,-EN,DR models 2. Startup time updated
J	2024-07-12	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