

Product Datasheet



The global certified BLD-400-C is a dual stage D4i/DALI2 LED driver. 10kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. It supports high accuracy energy report and all D4i related requirement. NFC programming makes driver setting easier for users. All around protections including digital OTP with auto-recovery secure 24hour non-stop operation for luminaires.



■ Features 2

■ Model List2

■ Technical Data3

■ Safety/EMC Compliance 4

■ Dimming4

■ Programming 5

■ Lifetime vs. Case Temperature 7

■ Power Factor vs. Load7

■ THD vs. Load8

■ Efficiency vs. Load 8

■ Inrush Current10

■ Dielectric Strength 11

■ Tc Point 11

■ Packaging Information 11

■ Mechanical Design 12

■ Output Operation Range 14

■ Revision History 15

400W, D4i Compatible, NFC Programmable LED Driver

■ Features

- Supply Voltage: 90~305Vac or 127-420Vdc, 186-250Vdc with EL Mark
- Great Surge Immunity 10kV
- D4i/DALI2.0 Comply with IEC62386-101,102,150,207,250,251,252,253
- Integrated 16Vdc Bus Power Supply
- $\pm 1\%$ Energy Report Accuracy
- Dim Off with 0.5W Standby Power
- 24V 3W (10W Transient Peak) Aux-Power
- 100,000Hour Life @ Tc=75°C
- 7 Year Warranty @ Tc<=75°C
- Airset™ NFC Programmability
- EL Mark with Programmable EOFx
- Dim Off with 0.5W Standby Power
- UL Class P, ENEC/CB/CCC SELV Output
- Global Certified Model Available
- Safety according to EN 61347-1, 61347-2-3, 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
BLD-400-C280-ARZ	90~305Vac or 127-420Vdc	400 W	86-190Vdc	2100mA	2800mA
BLD-400-C420-ARZ		400 W	57-143Vdc	2800mA	4200mA
BLD-400-C990-ARZ		400 W	24-58Vdc	6900mA	9900mA

Note: 1. Add suffix –D00000 to indicate the D4i model without 24Vaux.

2. Add suffix –DAX000 to indicate the D4i model with 24Vaux.

3. See the **Output Operation Range Section** for programmable model details.

Z=	U	V	S	S-GLB000	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 Class I 220-277Vac	UL Recognized 120-277Vac ENEC CB RCM Class I 220-277Vac	Class I 120-277Vac	ENEC CB Class II 220-277Vac

400W, D4i Compatible, NFC Programmable LED Driver

■ Technical Data

Input Voltage	90~305Vac or 127-420Vdc
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
Ripple Current	Ip-p:5%Io max
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 $T_c \geq 105 \pm 10^\circ\text{C}$; Auto Recovery When $T_c \leq 70 \pm 10^\circ\text{C}$
Operating Temperature	Case Temperature $T_c = -40^\circ\text{C} \sim +90^\circ\text{C}$; 10%RH~100%RH
Storage Temperature	$-40^\circ\text{C} \sim +85^\circ\text{C}$; 5%RH~100%RH
MTBF	$\geq 280,000$ hours, 75°C case temperature (MIL-HDBK-217F)
Lifetime	$\geq 100,000$ hours, 75°C case temperature, refer to life vs. T_c curve
Case Temperature	90°C max, marked in the T_c point of label
Dimension	240 x 90 x 41.5 by mm (body), 267x 90 x 41.5 by mm (endcaps included)
Net Weight	1600g
Packing	See Package Information Section in the datasheet

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

400W, D4i Compatible, NFC Programmable LED Driver

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

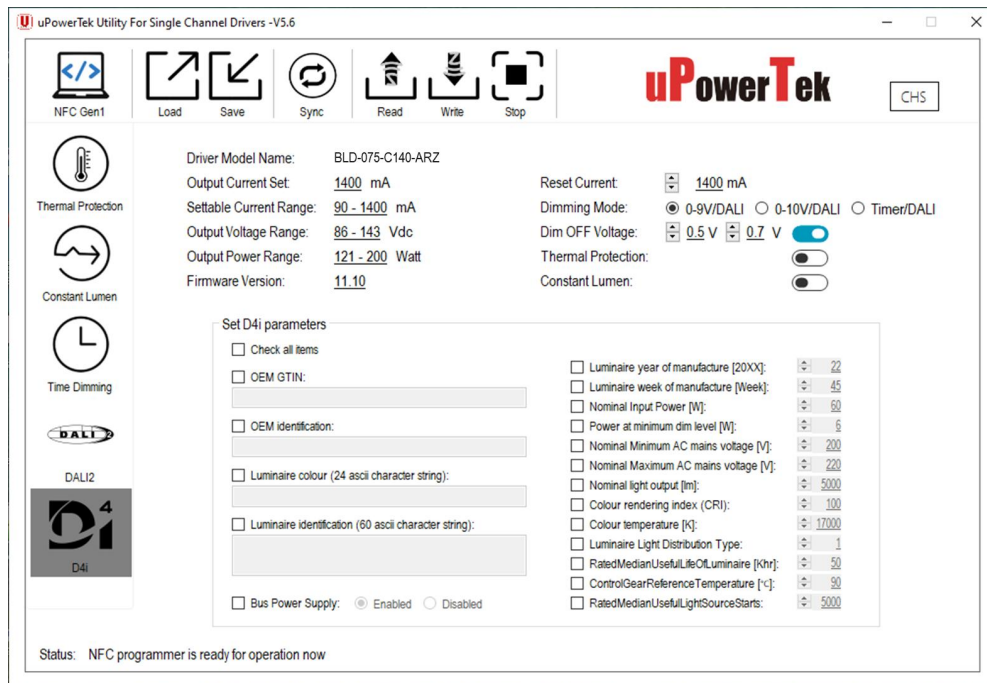
Parameter	Min.	Typ.	Max.
DALI Interface Standard	IEC62386-101,102,150,207,250,251,252,253		
Dimming Range	10%	Logarithmic (default)	100%
DA1,DA2 High Level	9.5V	16V	22.5V
DA1,DA2 Low Level	-6.5V	0	6.5V
DA1,DA2 Current	0		2mA
Bus Power Supply Voltage	12Vdc	16Vdc	20Vdc
Bus Power Supply Current	52mA	-	60mA
Auxiliary Power Voltage	21.6V	24V	26.4V
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
Fast Dimming On-Off Transition		300ms	
Fast Dimming 10-100% Io Transition		70ms	

400W, D4i Compatible, NFC Programmable LED Driver

■ 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 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.



NFC Programmer V1



NFC Programmer V2



FEIG NFC Programmer



Android or iPhone

400W, D4i Compatible, NFC Programmable LED Driver

- 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/>.

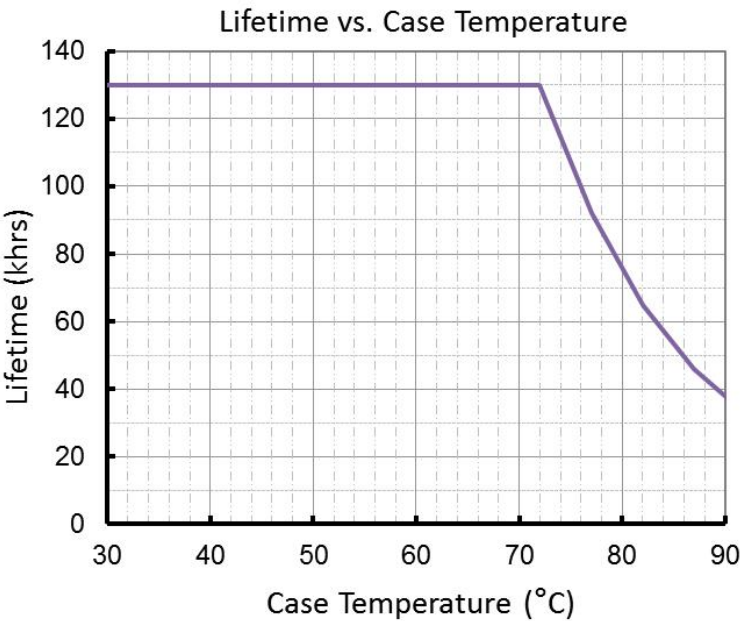


Wireless Programming



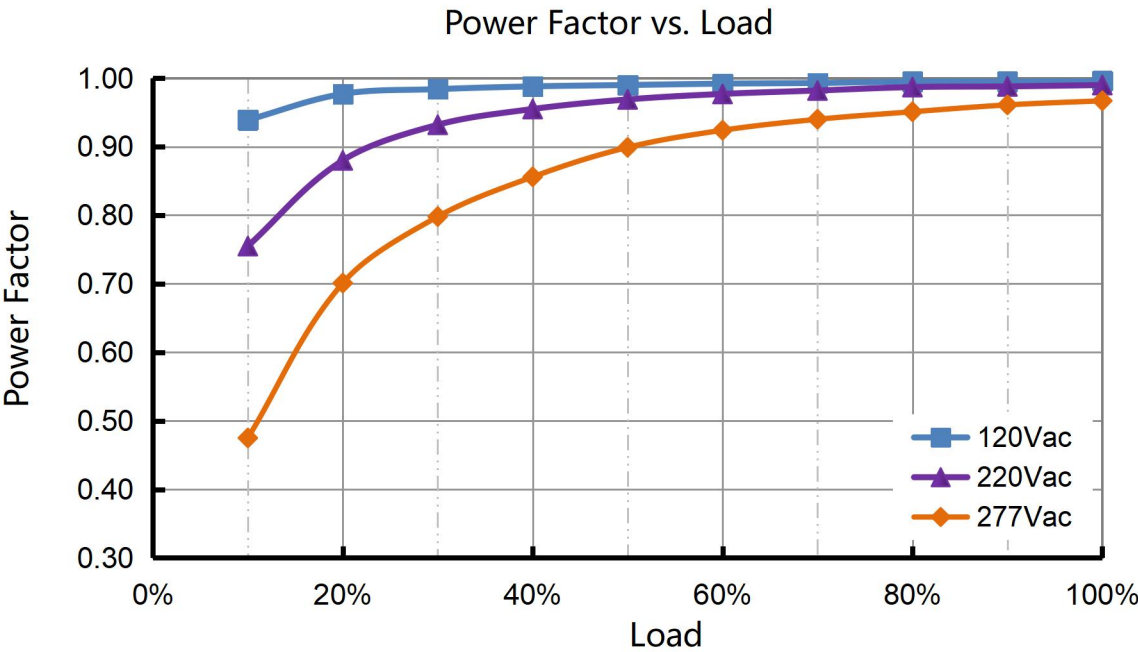
Cellphone Programming

■ Lifetime vs. Case Temperature

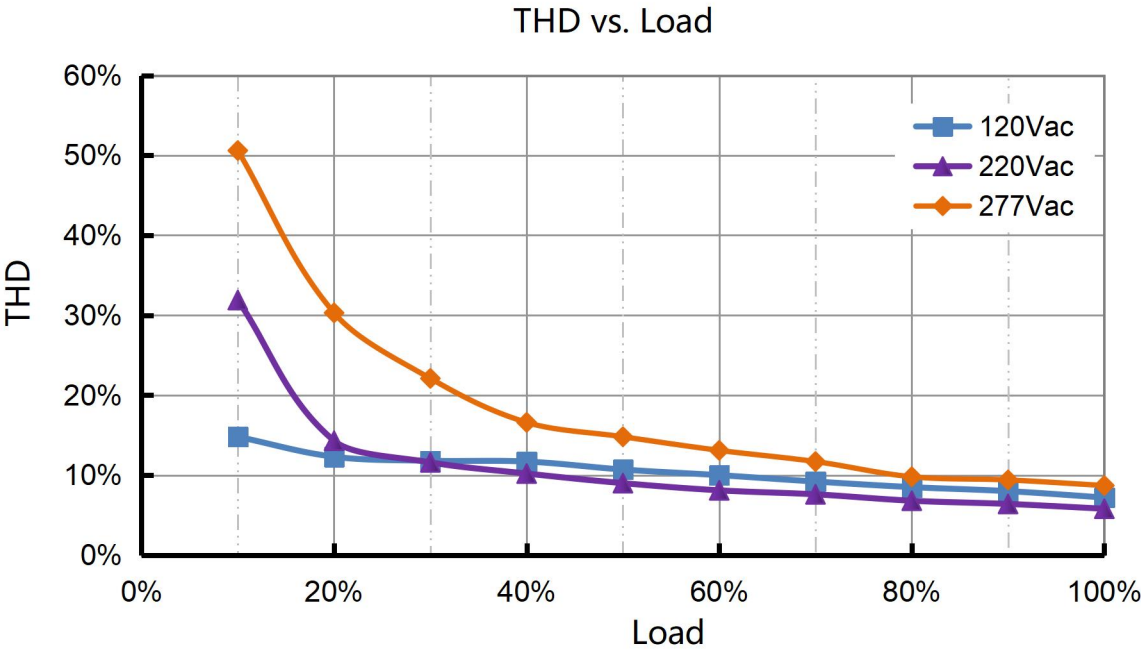


(End of Life: Maximum Failure Rate=10%)

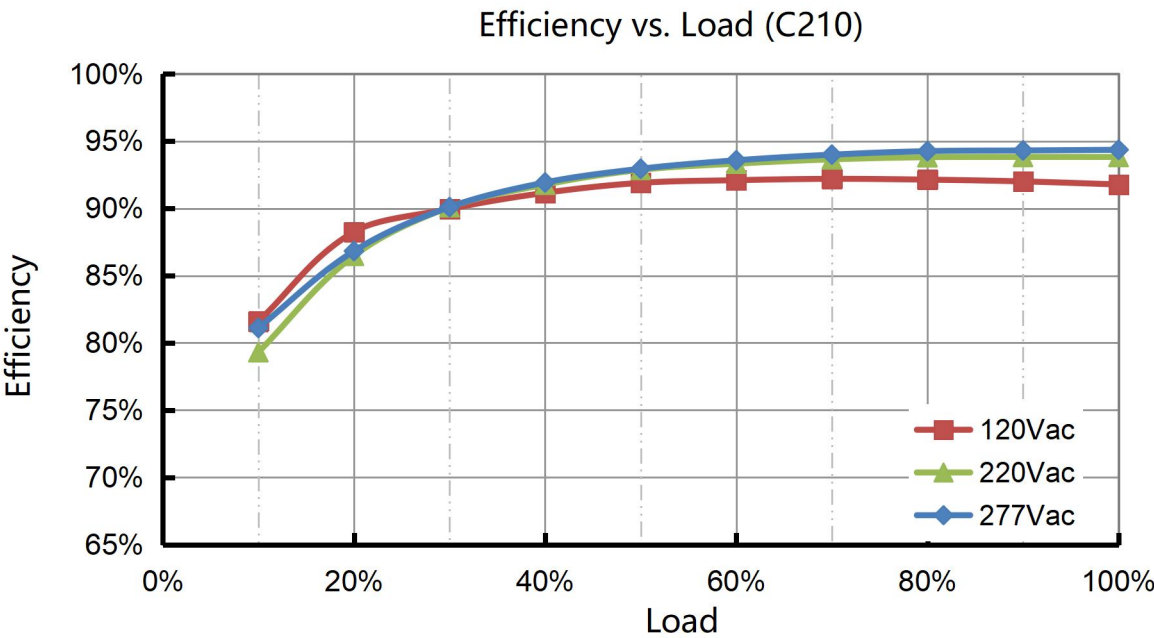
■ Power Factor vs. Load



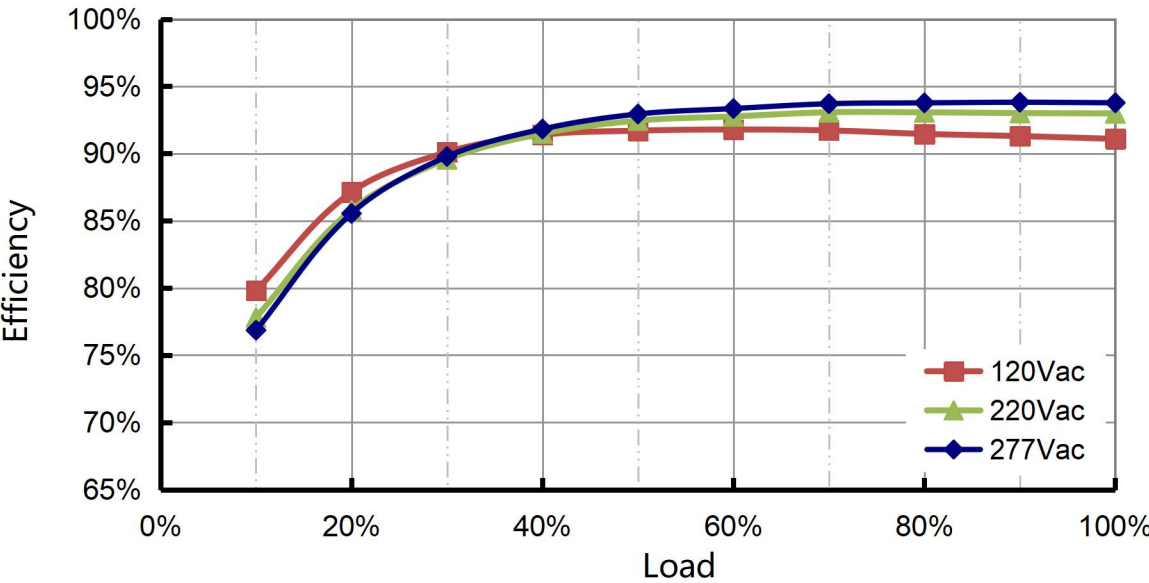
THD vs. Load



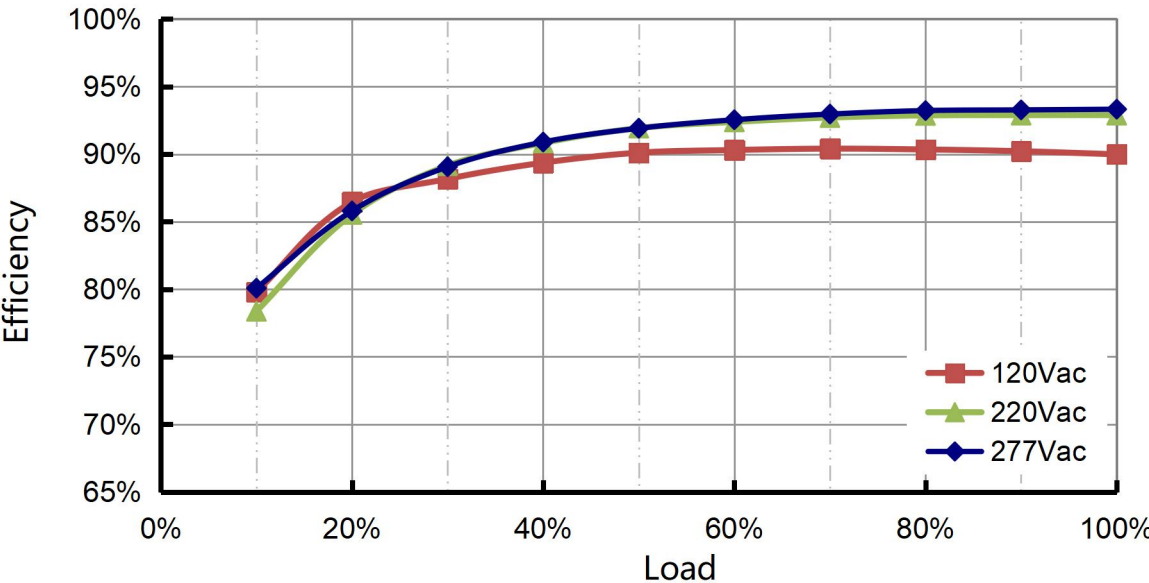
Efficiency vs. Load



Efficiency vs. Load (C280)

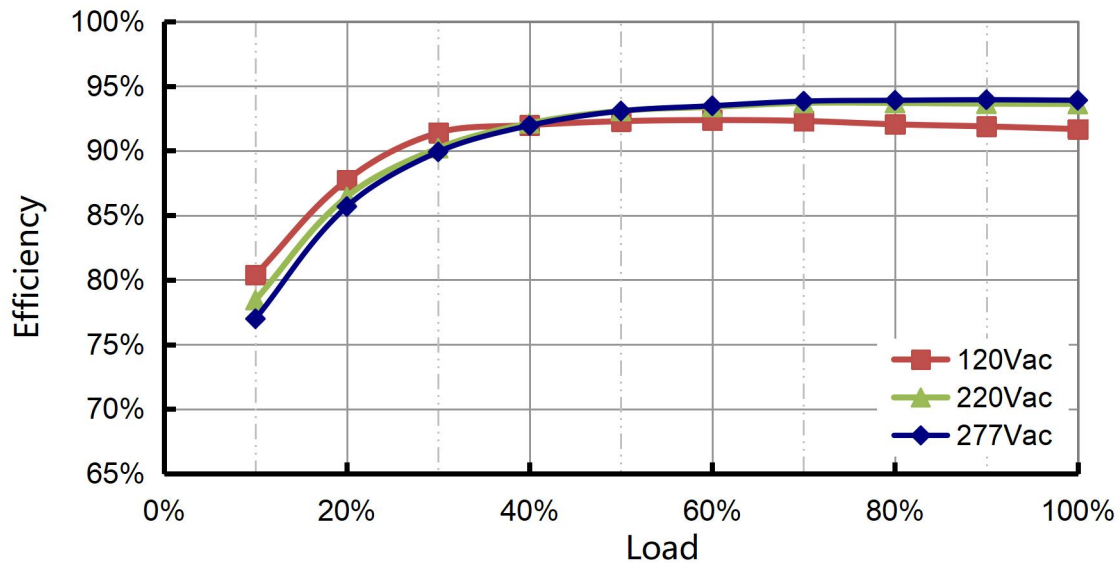


Efficiency vs. Load (C420)

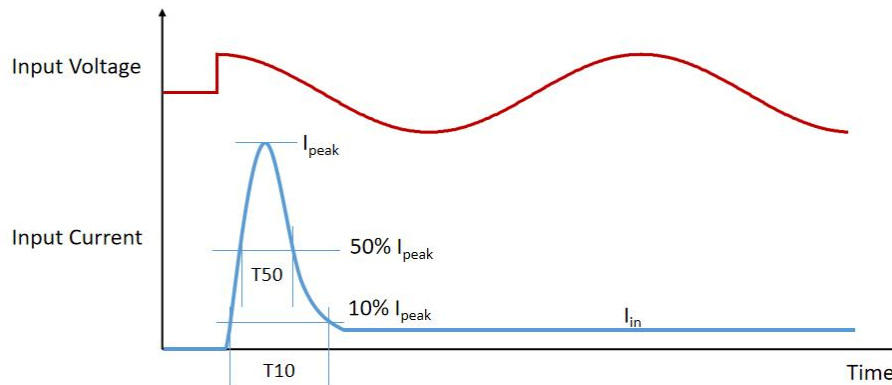


400W, D4i Compatible, NFC Programmable LED Driver

Efficiency vs. Load (C990)



■ 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

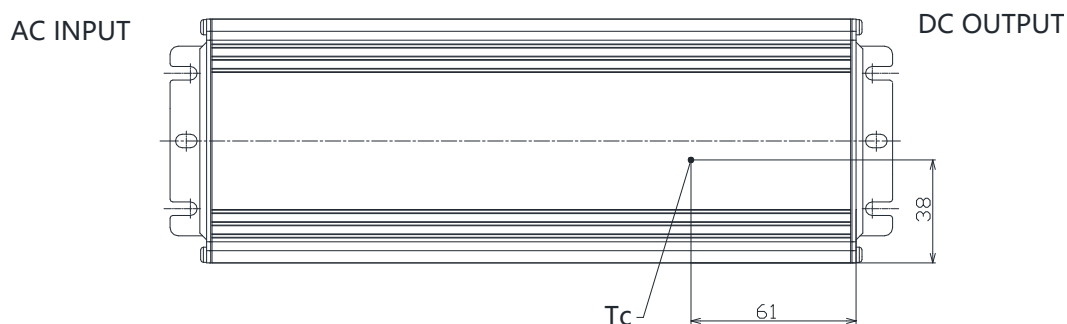
Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
Driver Quantity	3	4	7	9	3	5	8	11	4	6	10	12

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

■ Dielectric Strength

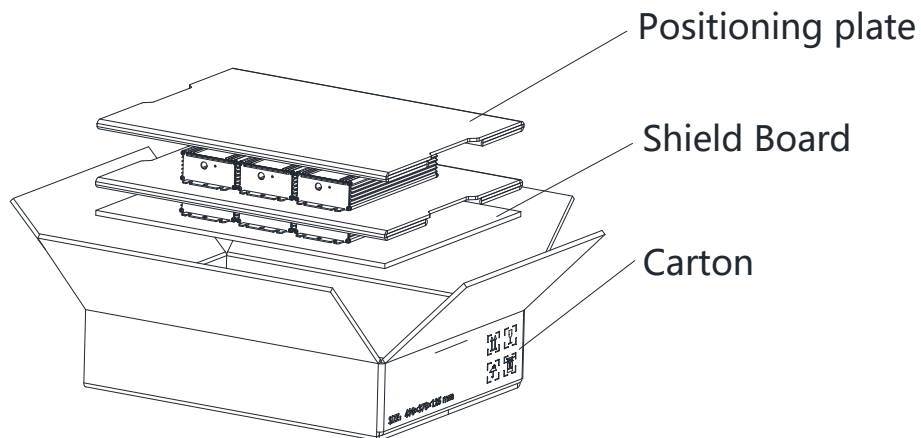
Unit: Vac	Input	Output	Dimming	Case
Input	-	3750	3750	1554
Output	3750	-	1554	1554
Dimming	3750	1554	-	1554
Case	1554	1554	1554	-

■ Tc Point



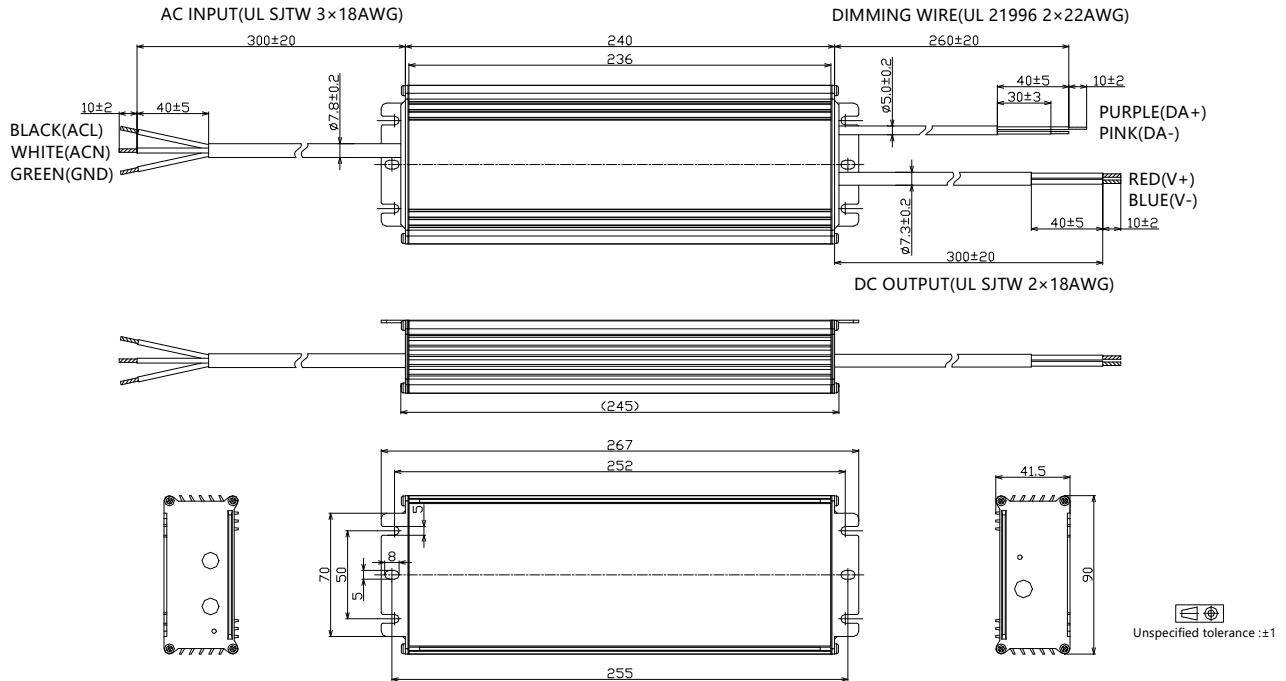
■ Packaging Information

Typical Carton Dimension(L×W×H)	490×370×125 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	6pcs/carton
Net Weight	10.1 kg/carton
Gross Weight	11.1 kg/carton

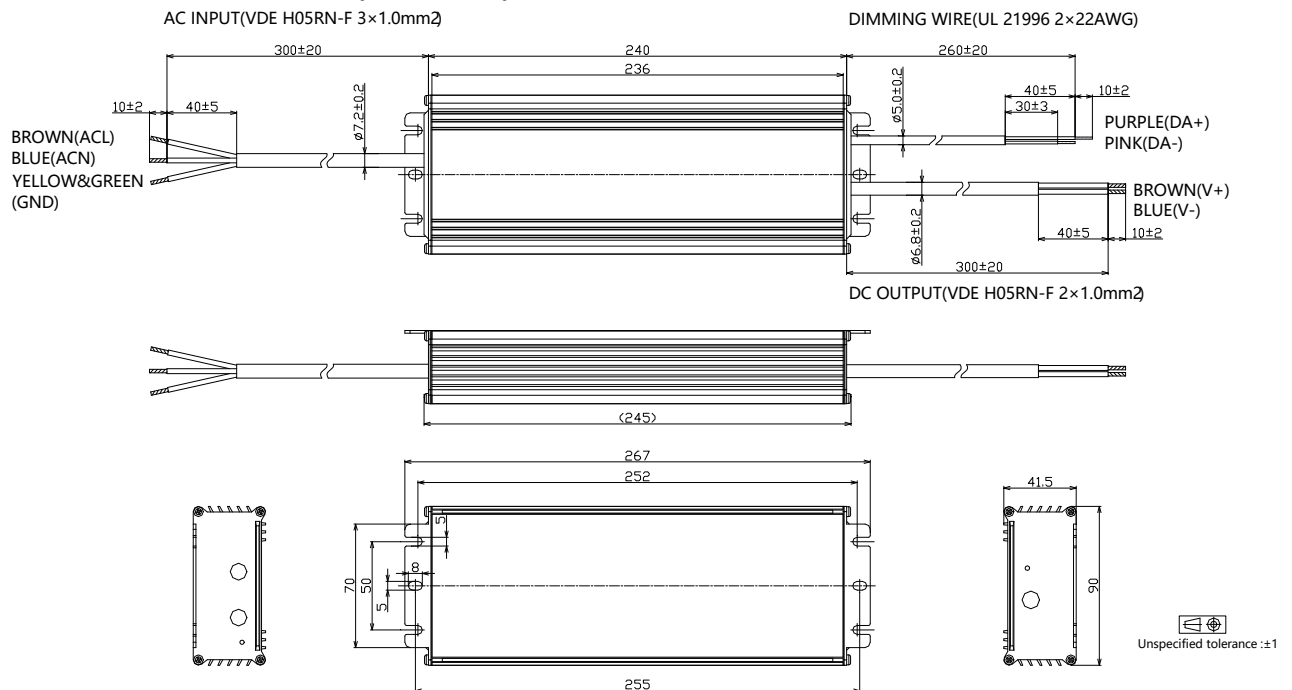


Mechanical Design

BLD-400-Cxxx-ARU-D00000 (UL Cable)

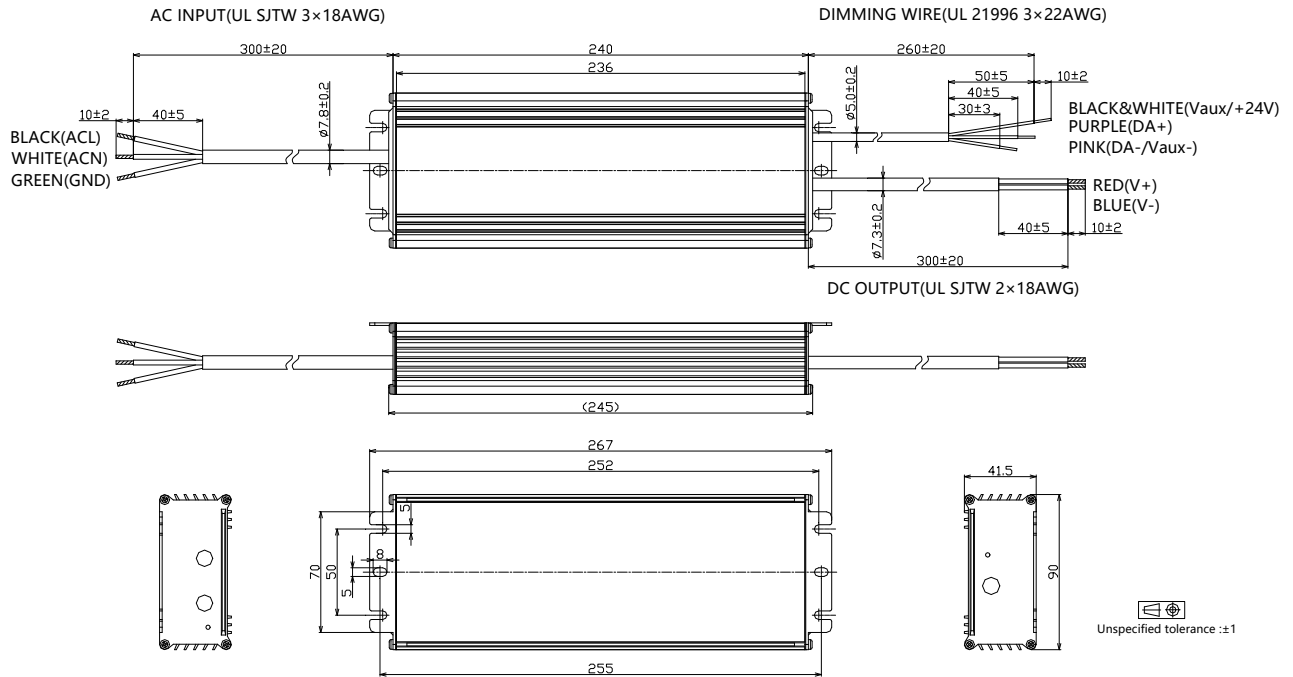


BLD-400-Cxxx-ARS-D00000 (VDE Cable)

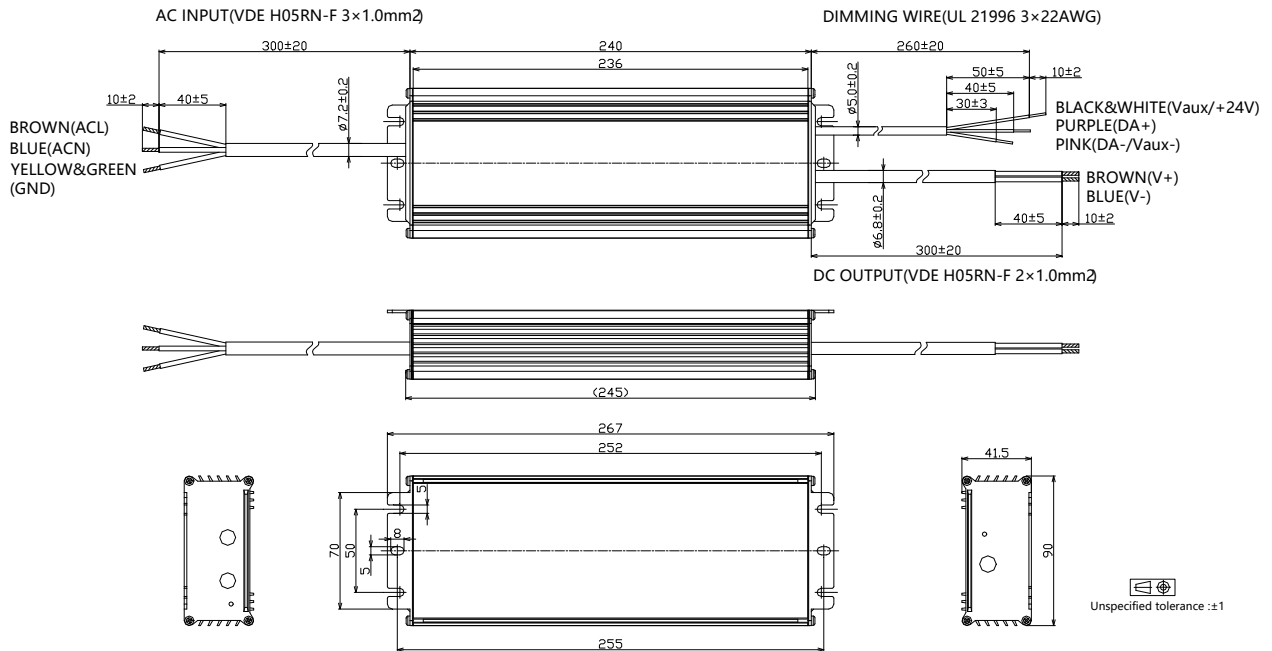


400W, D4i Compatible, NFC Programmable LED Driver

- BLD-400-Cxxx-ARU-DAX000 (UL Cable)



- BLD-400-Cxxx-ARS-DAX000 (VDE Cable)



400W, D4i Compatible, NFC Programmable LED Driver

■ 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	400	86	143	280
	2700	400	89	148	270
	2600	400	92	154	260
	2500	400	96	160	250
	4000	400	100	167	240
	2300	400	104	174	230
	2200	400	109	182	220
	2100	400	114	190	210
	2000	381	114	190	210
	1900	362	114	190	210
	1800	343	114	190	210
	1700	324	114	190	210
	...	...	...	...	...
	210	40	114	190	210

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C420	4200	400	57	95	420
	4100	400	59	98	410
	4000	400	60	100	400
	3900	400	62	103	390
	3800	400	63	105	380
	3700	400	65	108	370
	3600	400	67	111	360
	3500	400	69	114	350
	3400	400	71	118	340
	3300	400	73	121	330
	3200	400	75	125	320
	3100	400	77	129	310
	3000	400	80	133	300
	2900	400	83	138	290
	2800	400	86	143	280
	2700	386	86	143	280
	...	...	86	143	...
	280	40	86	143	280

400W, D4i Compatible, NFC Programmable LED Driver

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	24	40	990
	9600	400	25	42	960
	9300	400	26	43	930
	9000	400	27	44	900
	8700	400	28	46	870
	8400	400	29	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
	5700	331	35	58	690
	5400	313	35	58	690
	...	...	...	...	...
	690	40	35	58	690

■ Revision History

Revision	Date	Contents
A	2023-06-01	1. First release
B	2023-7-14	1. Update cable selection table in Model List Section
C	2023-10-08	1. EL mark with programmable EOFx added
D	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