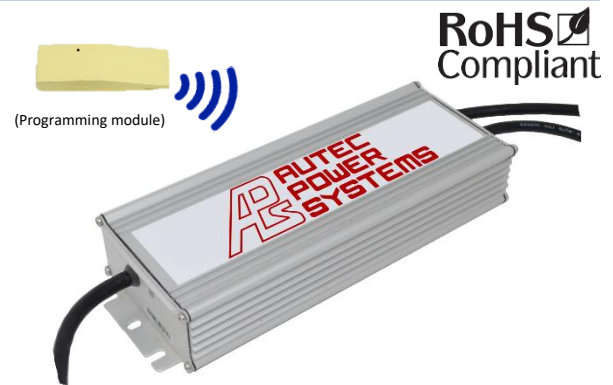


■ Features

- Power Rating: 160W
- Input Voltage: 180-528Vac
- Constant current design
- Output current settable(700mA-6300mA)
- +/-2% Output Current Accuracy (Programmable Model)
- Near Field Communication Programmability
- High-Efficiency @ 90% and above
- 0-10V/PWM/Timer/DALI/DMX (Optional) Dimming
- Dim to Off with 1.5W Standby Power
- Optional External Thermal Protection NTC
- UL Class P, Type HL
- OVP, SCP, & OTP
- IP67
- 5+ year warranty
- Surge Immunity 10kV



*Product images are for illustrative purposes only and may vary from actual design.

■ Application

- Bay lights, Pole lights, Stadium lights, Horticultural lighting

■ Model List

Model Number	Input Voltage Range	Output Power	Output Voltage	Output Current Min	Output Current Max	Certification
LHA160-C105-XYZ	180-528Vac	160W	91-229V	700mA	1050mA	UL/cUL
LHA160-C140-XYZ	180-528Vac	160W	69-152V	1050mA	1400mA	UL/cUL
LHA160-C210-XYZ	180-528Vac	160W	46-114V	1400mA	2100mA	UL/cUL
LHA160-C420-XYZ	180-528Vac	160W	23-55V	2800mA	4200mA	UL/cUL
LHA160-C630-XYZ	180-528Vac	160W	14-36V	4400mA	6300mA	UL/cUL

Ordering Options	XY=	Dimming Method	Programmable	12Vaux	Dim-off
	NN	-	-	-	-
	EN	0-10V	-	√	√
	TR	Timer	√	-	-
	ER	0-10V/PWM/Timer	√	√	√
	AN	DALI	-	-	√
	MX*	DMX	√	-	√
Cable Options	Z=	K=UL cable with ground wire (green), S=VDE cable/Class I, D=VDE cable/Class II			
External Thermal Protection NTC Option	-THR	LHA160-C105-XYZ-THR			

DMX Notes: Works with DMX-512 Presently. DMX Dimming range 10-100% (1% DMX command will be treated as 10% Dimming).

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■ Technical Data

Input Voltage	180-528Vac or 250-740Vdc
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	0.90Amax@277Vac & Full-Load, 0.45Amax@480Vac & Full-Load
Inrush Current	65A peak, 1.2ms duration, <0.25A2s@277Vac, Cold Start 70A peak, 1.3ms duration, <0.5A2s@480Vac, Cold Start
Leakage Current	1mA max @480Vac 60Hz, UL8750, 0.75mAmax @220Vac 50Hz, IEC61347-1
Input Under Voltage	Shut down and auto-restart
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±5%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 $T_c \leq 70 \pm 10^\circ\text{C}$ 105 +/- 10°C (relates to internal component temperature / optional settings are possible, contact Autec sales)
Auxiliary Power (Vaux)	12V+/-5%, 300mA max
Operating Temperature	-40°C~+70°C ; 10%RH~100%RH (See Derating Curve for more details)
Storage Temperature	-40°C~+85°C ; 5%RH~100%RH
MTBF	≥280,000 hours, 75°C case temperature (MIL-HDBK-217F)
Lifetime	≥100,000 hours, 75°C case temperature, refer to life vs. Tc curve
Case Temperature	90°C max, marked in the Tc point of label
Dimensions	8.85x2.68x1.51 by inch (body), 9.88x2.68x1.51 by inch (endcaps included)
	225x68x38.5 by mm (body), 251x68x38.5 by mm (endcaps included)
Net Weight	1200g
Packing	16pcs/Cartron/20.2kg, 490x370x210 by mm

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

*Marked items are optional. Please contact Autec Sales to specify the required functions.

■ 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 DC or AC supplied electronic control gear for LED modules
EMI Standards	Description
IEC 55015	Conducted emission test & radiated emission test
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4:2009 Class B
EMS Standards	Description
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

Disclaimer:

Autec Power Systems' (Autec) LED Drivers are Hi-Pot tested during the manufacturing process. Autec assumes no responsibility for secondary Hi-Pot testing at customer location or designated production line(s). Should customer require further Hi-Pot testing, at their own production line, following assembly of the LED Driver into the customer's assembled fixture, Autec requests advance notice. This request must be communicated to Autec in a timely manner and is recommended to be requested at time of issuing each purchase order.

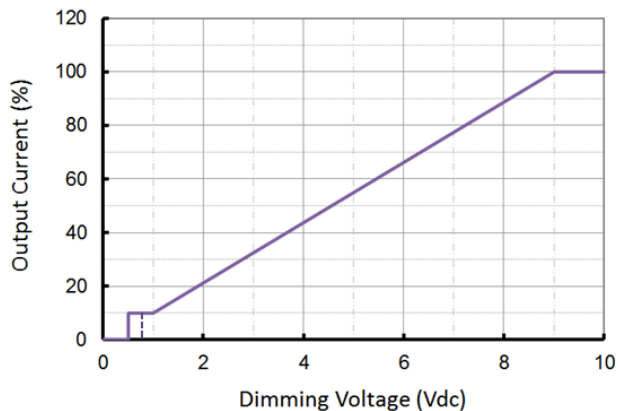
■ Dimming

Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	200uA	300uA	450uA
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%
PWM High	3V		10V
PWM Low	0V		0.6V
PWM Frequency	300Hz		2kHz
External PWM Controller Current Sinking Capability	300uA		
DA1,DA2 High Level	9.5	16	22.5
DA1,DA2 Low Level	-6.5	0	6.5
DA1,DA2 Current	0		2mA

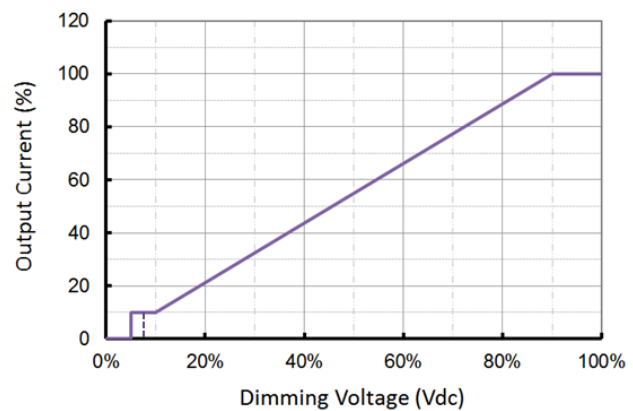
■ Dimming Curve

a. With dim-off (default)

0-10V Dimming Curve

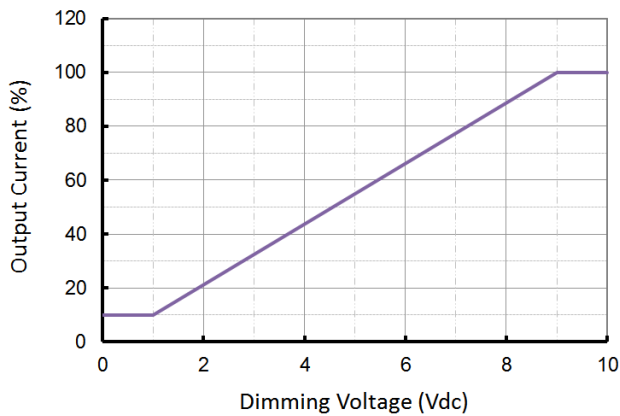


PWM Dimming Curve

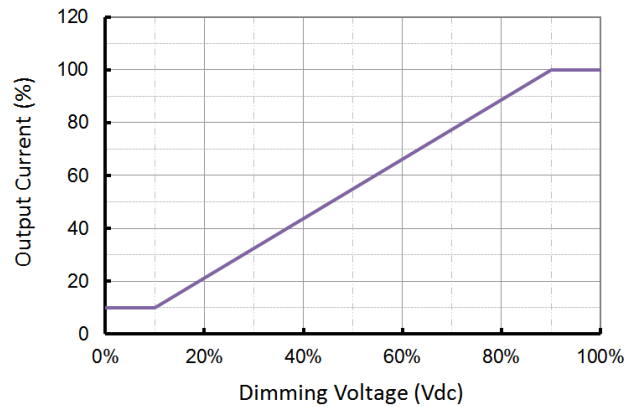


b. Without dim-off (contact sales to get this feature)

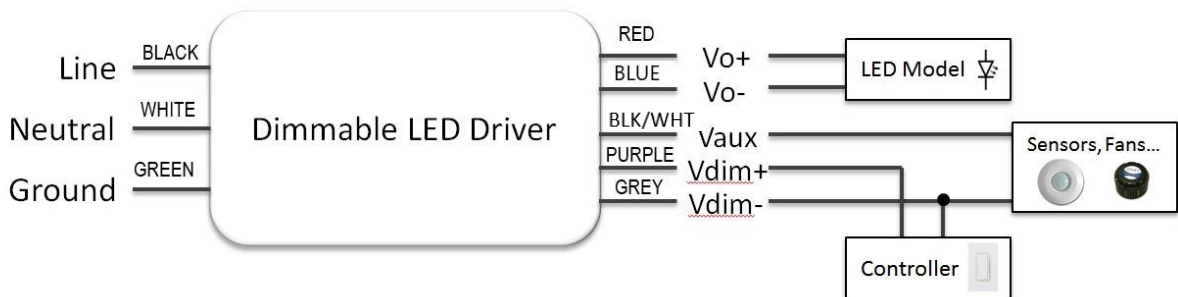
0-10V Dimming Curve



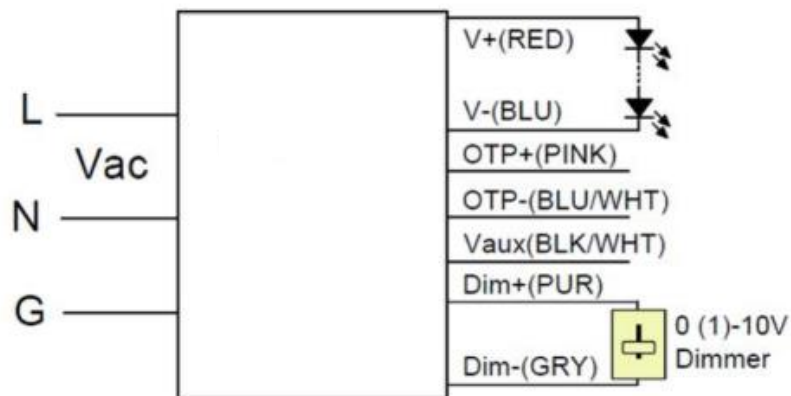
PWM Dimming Curve



■ Wiring Diagram



■ Wiring Diagram/Optional External Thermal Protection



■ External Thermal Protection Table(optional)

Parameter		Min.	Typ.	Max.	Notes
External Thermal Protection NTC	R1	-	7.81 kOhm	-	When R_NTC falls below R1, External Thermal Protection is triggered, reducing output current until R2 is reached.
	R2	-	4.16 kOhm	-	When R_NTC is less than R2, output current is reduced to the programmed "Protection Current Floor."
	Protection Current Floor	10%loset	60%loset	100%loset	10%loset>lomin (default setting is 60%)
		lomin	60%loset	100%loset	10%loset≤lomin (default setting is 60%)

■ Near Field Communication Programmability

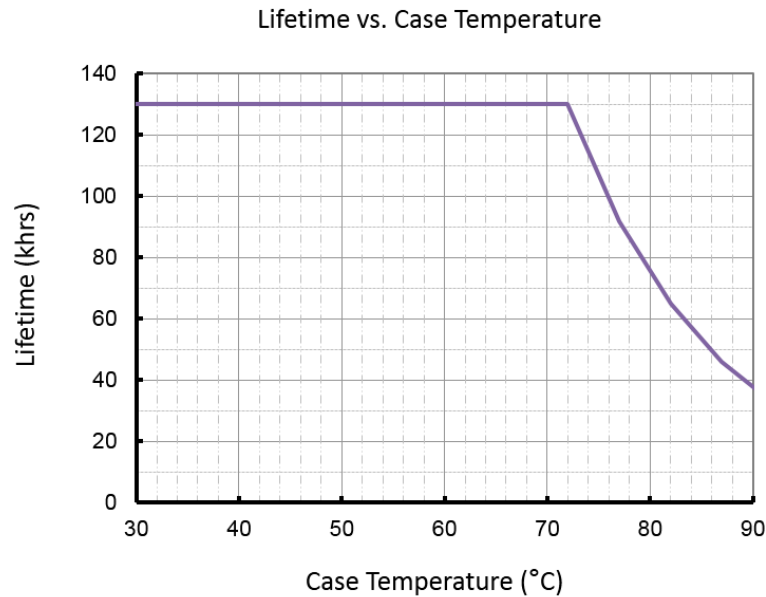


Programming Module
REF. Part# UPRG-NFC

NOTES:

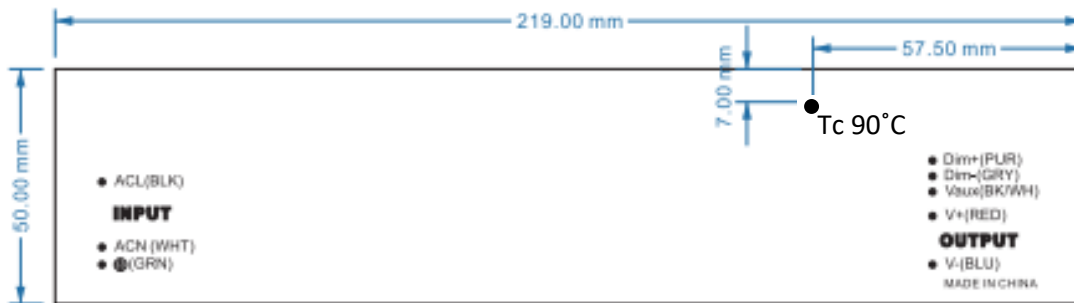
1. The Near Field Communication programming module is used to program the output current, voltage, dimming, and timer settings.
2. The programming function is a non-contact process, which is safer and more efficient compared to traditional programming methods.
3. During programming the LED Driver does not require any external power source.
4. REF. Ordering part number UPRG-NFC (includes programming module, USB cable, and *software).
5. Contact Autech Sales for User Guide and programming software for complete programming instructions.

■ Lifetime vs. Case Temperature



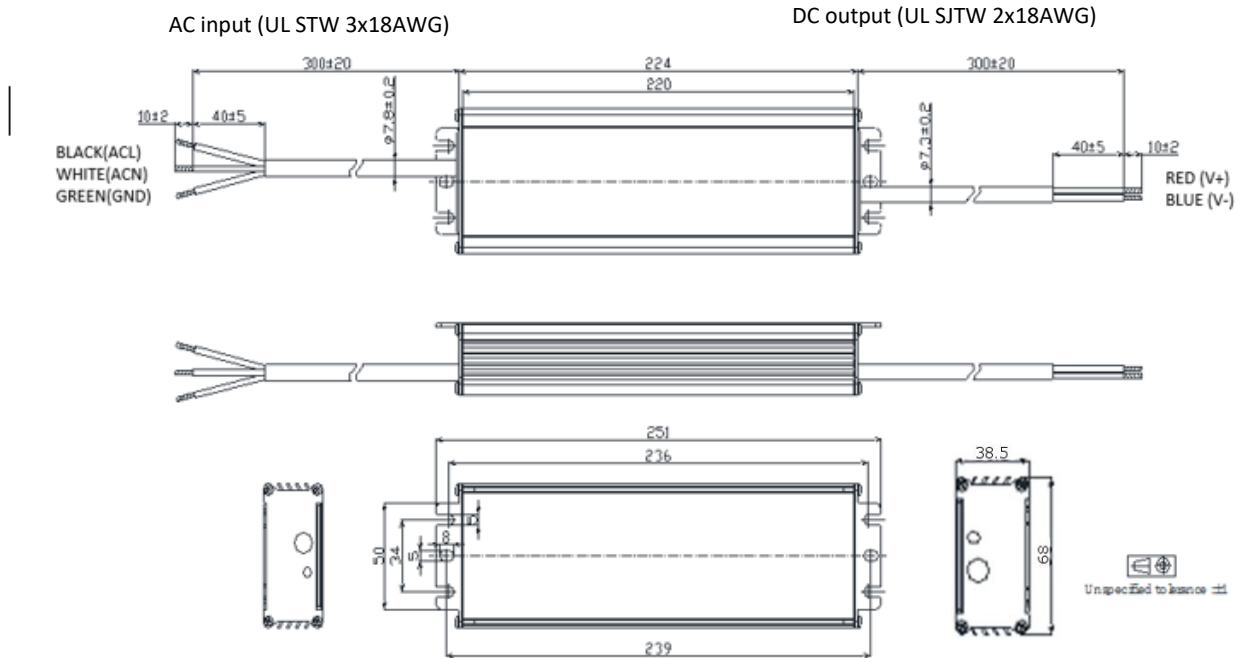
(End of Life: Maximum Failure Rate=10%)

■ Tc Location(LED Driver Label)

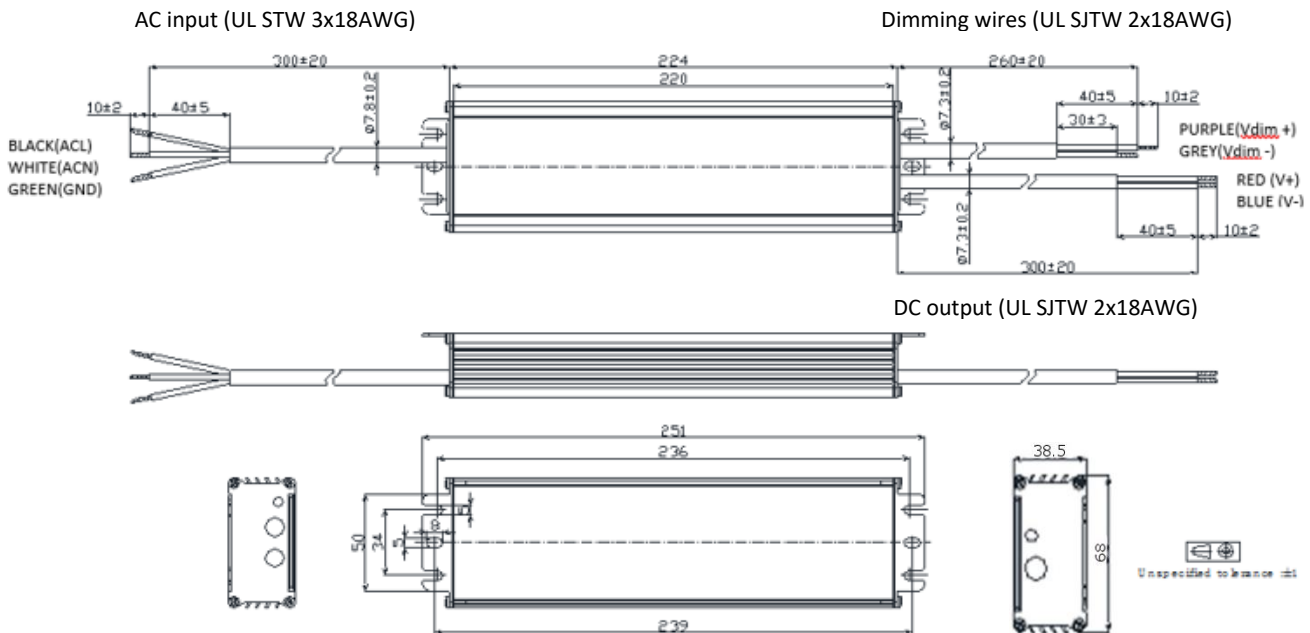


■ Mechanical Design

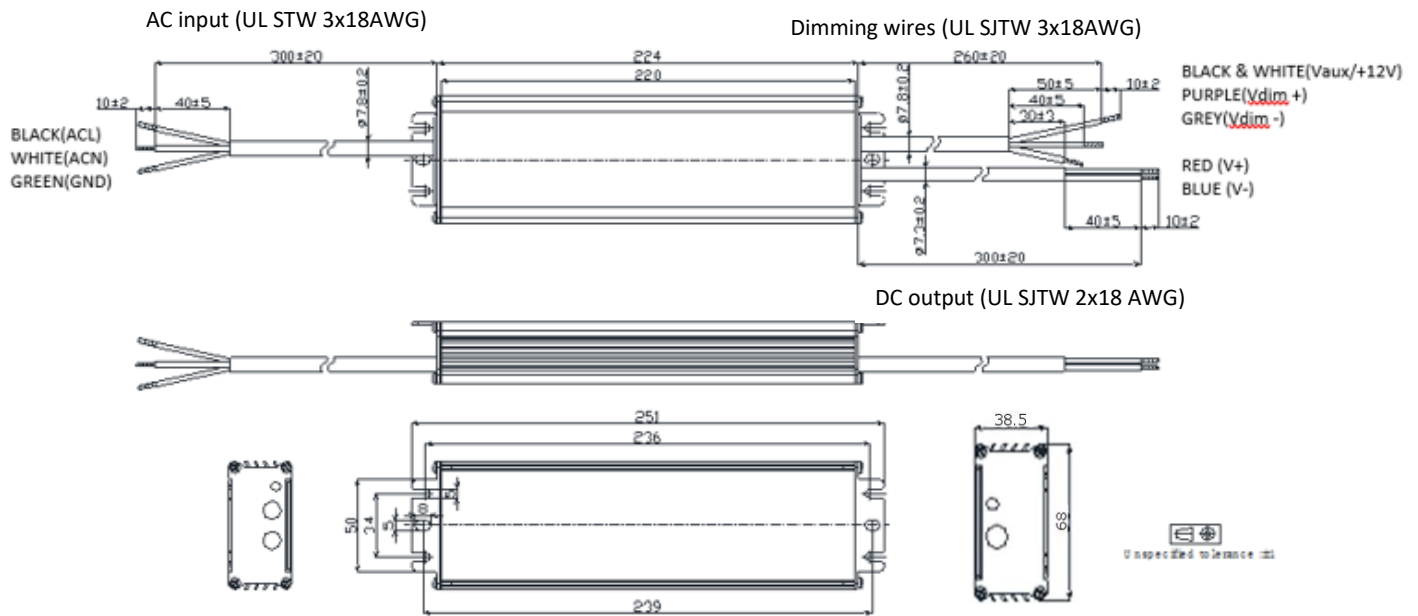
- LHA160-Cxxx-NN/TRK (UL Cable)



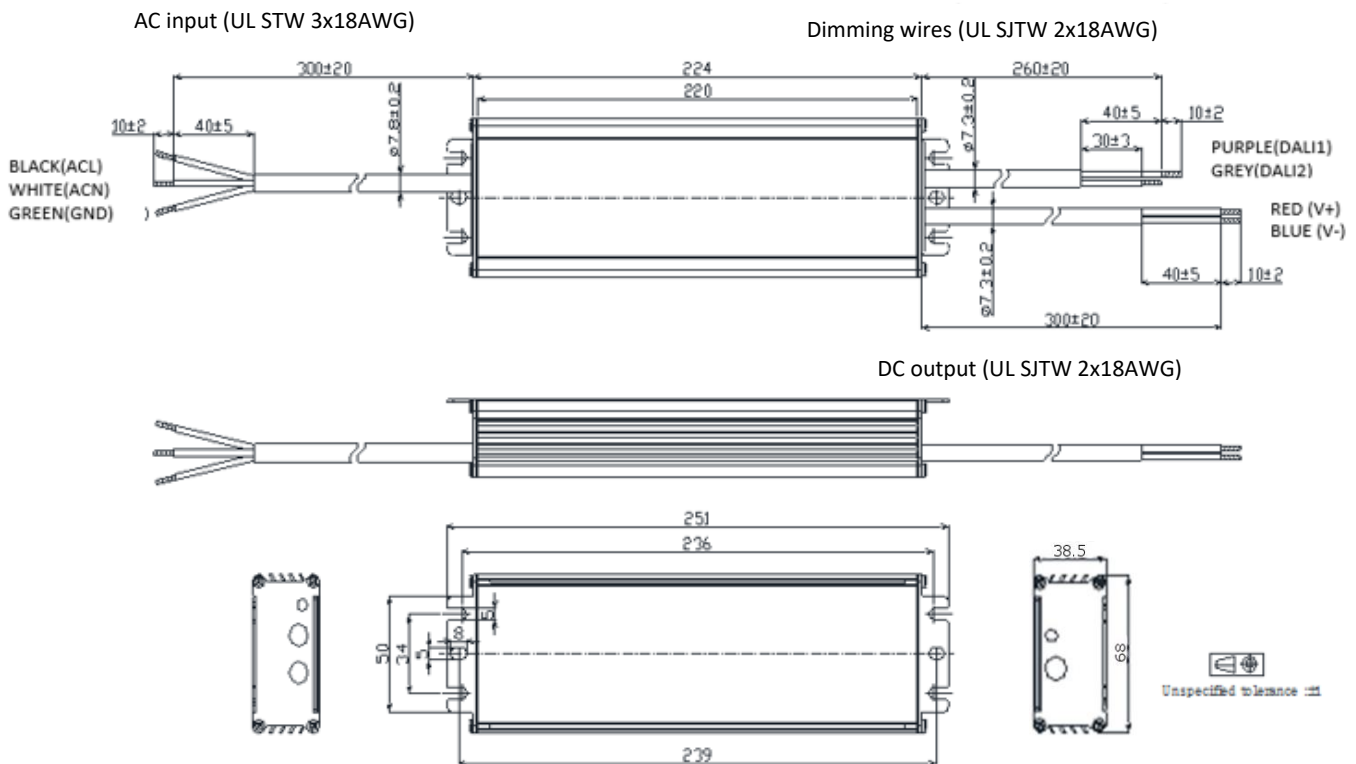
- LHA160-Cxxx-DN/DRK (UL Cable)



LHA160-Cxxx-EN/ERK (UL Cable)



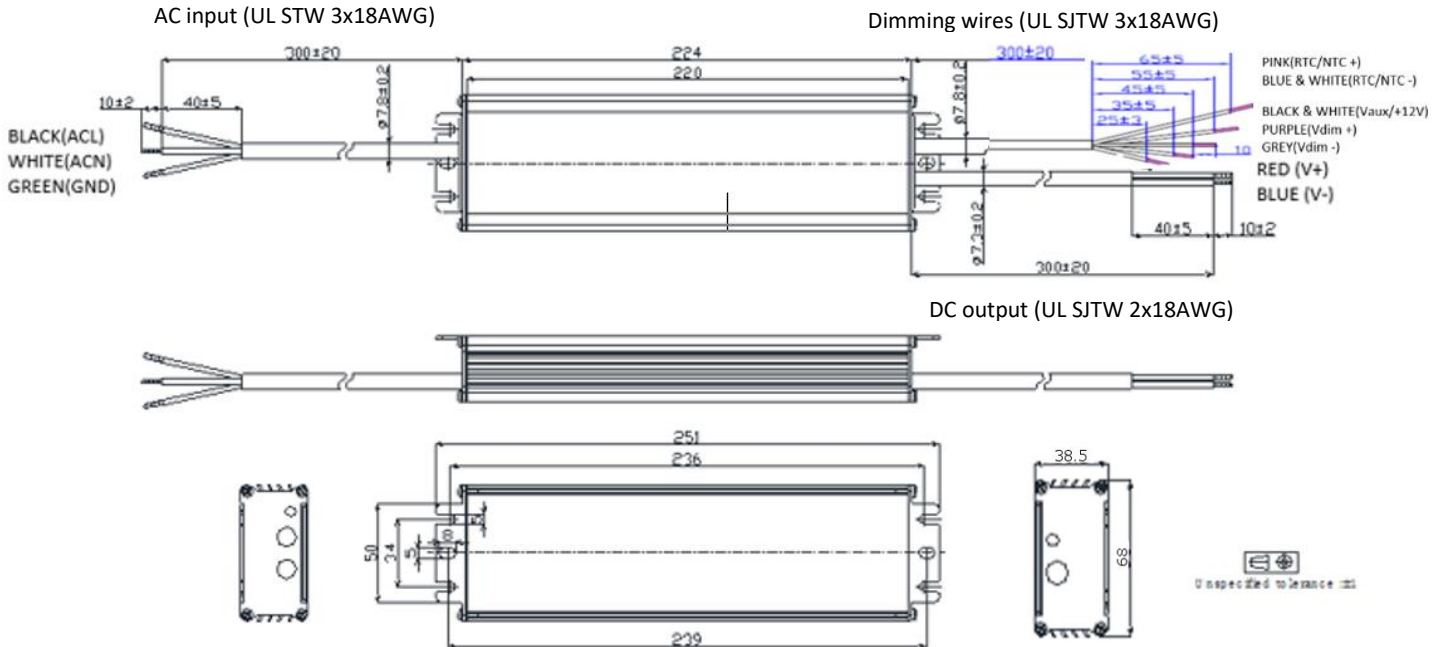
- **LHA160-Cxxx-ANK (UL Cable)**



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- LHA160-Cxxx-ERK-THR (Optional Thermal Protection)



***Contact Autec Sales for non UL Mechanical Diagrams**

■ Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
LHA160-C105	1050	160	91	152	105
	1000	160	96	160	100
	950	160	101	168	95
	900	160	107	178	90
	850	160	113	188	85
	800	160	120	200	80
	750	160	128	213	75
	700	160	137	229	70
	650	149	137	229	70
	600	137	137	229	70
	550	126	137	229	70
	500	114	137	229	70
	...	...	...	...	...
	70	16	137	229	70

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
LHA160-C140	1400	160	69	114	140
	1300	160	74	123	130
	1200	160	80	133	120
	1100	160	87	145	110
	1050	160	91	152	105
	1000	152	91	152	105
	950	145	91	152	105
	900	137	91	152	105
	850	130	91	152	105
	800	122	91	152	105
	750	114	91	152	105
	700	107	91	152	105
	...	...	...	...	...
	105	16	91	152	105

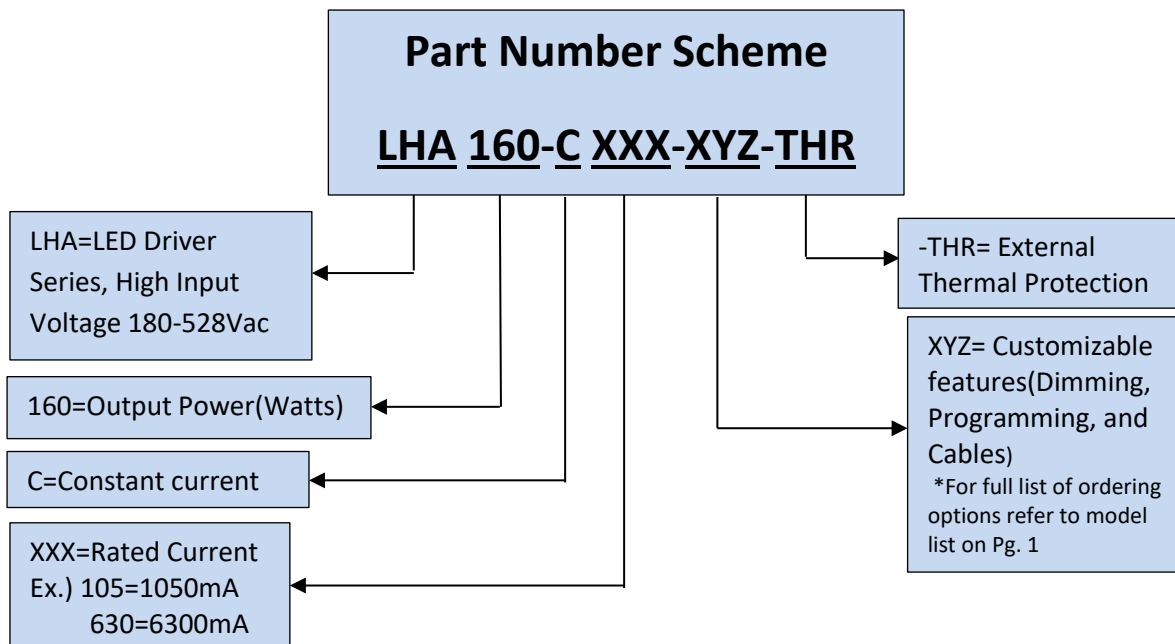
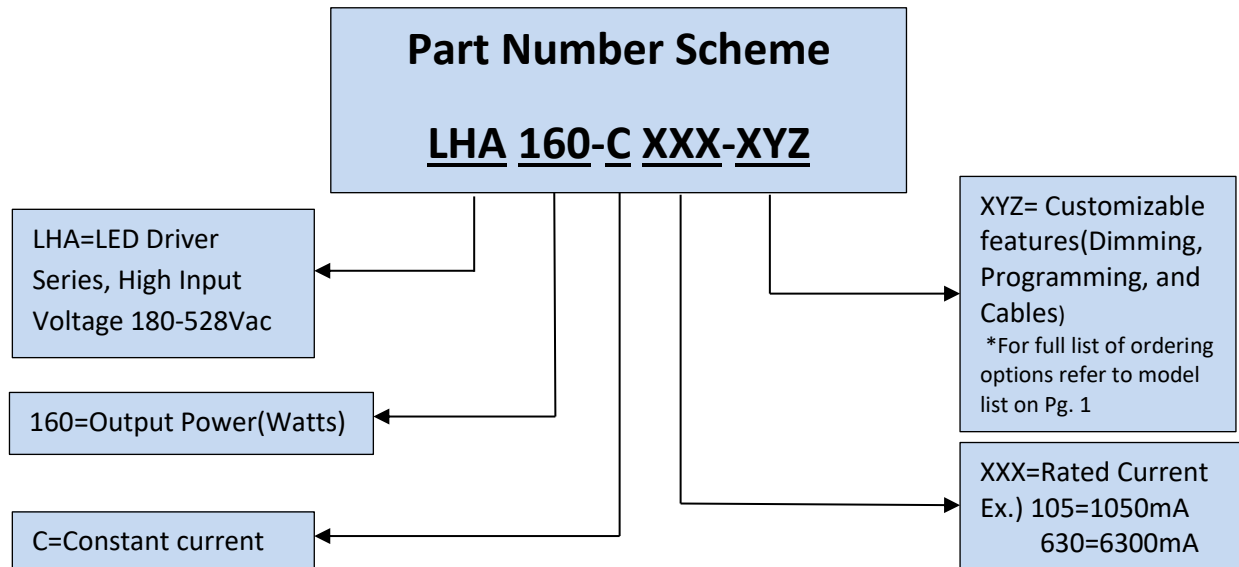
Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
LHA160-C210	2100	160	46	76	210
	2000	160	48	80	200
	1900	160	51	84	190
	1800	160	53	89	180
	1700	160	56	94	170
	1600	160	60	100	160
	1500	160	64	107	150
	1400	160	69	114	140
	1300	149	69	114	140
	1200	137	69	114	140
	1100	126	69	114	140
	1000	114	69	114	140
	...	...	...	...	...
	140	16	69	114	140
	...	...	...	...	...

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
LHA160-C420	4200	160	23	38	420
	4100	160	23	39	410
	4000	160	24	40	400
	3900	160	25	41	390
	3800	160	25	42	380
	3700	160	26	43	370
	3600	160	27	44	360
	3500	160	27	46	350
	3400	160	28	47	340
	3300	160	29	48	330
	3200	160	30	50	320
	3100	160	31	52	310
	3000	160	32	53	300
	2900	160	33	55	290
	2800	160	33	55	290
	2700	154	33	55	290
	2600	149	33	55	290
	...	...	...	...	...
	290	15	33	55	290

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
LHA160-C630	6300	160	15	25	630
	6100	160	16	26	610
	5900	160	16	27	590
	5700	160	17	28	570
	5500	160	17	29	550
	5300	160	18	30	530
	5100	160	19	31	510
	4900	160	20	33	490
	4700	160	20	34	470
	4500	160	21	36	450
	4400	160	22	36	440
	4300	160	22	36	440
	4200	160	22	36	440
	4100	160	22	36	440
	4000	160	22	36	440
	3900	156	22	36	440
	3800	152	22	36	440
	...	...	...	...	...
	440	18	22	36	440

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