

## ■ Features

- Power Rating: 400W
- Input Voltage: 180-528Vac
- Constant current design
- Output current settable(1400mA-4200mA)
- +/-2% Output Current Accuracy (Programmable Model)
- Near Field Communication Programmability
- High-Efficiency @ 90% and above
- 0-10V/PWM/Timer/DALI/DMX (Optional) Dimmable
- 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


**RoHS**   
Compliant


\*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 | Efficiency                       | Certification |
|-----------------|---------------------|--------------|----------------|--------------------|--------------------|----------------------------------|---------------|
| LHA400-C210-XYZ | 180-528Vac          | 400W         | 114-286Vdc     | 1400mA             | 2100mA             | 92.5% @ 120Vac<br>93.5% @ 277Vac | UL/cUL        |
| LHA400-C420-XYZ | 180-528Vac          | 400W         | 57-142Vdc      | 2800mA             | 4200mA             | 92% @ 120Vac<br>93% @ 277Vac     | UL/cUL        |
| LHA400-C990-XYZ | 180-528Vac          | 400W         | 24-58Vdc       | 6900mA             | 9900mA             | TBD                              | UL/cUL        |

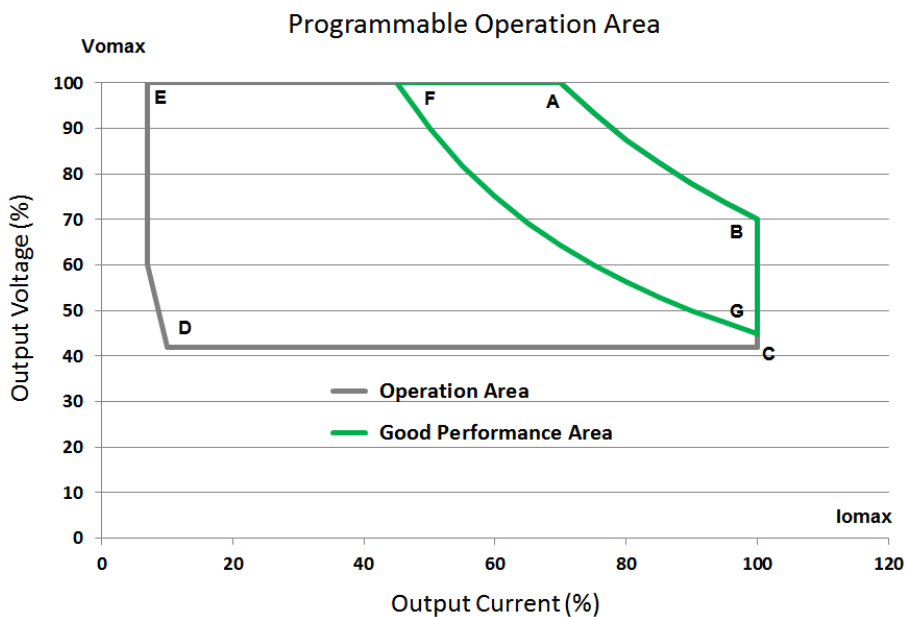
| Ordering Options                       | XY=  | Dimming Method                                                                 | Programmable | 12Vaux | Dim-off |
|----------------------------------------|------|--------------------------------------------------------------------------------|--------------|--------|---------|
|                                        | NN   | -                                                                              | -            | -      | -       |
|                                        | EN   | 0-10V                                                                          | -            | √      | √       |
|                                        | TR   | Timer                                                                          | √            | -      | -       |
|                                        | ER   | 0-10V/PWM/Timer                                                                | √            | √      | √       |
|                                        | AN   | DALI                                                                           | -            | -      | √       |
|                                        | AR   | 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 | LHA400-C210-XYZ-THR                                                            |              |        |         |

\*If ordering DMX, Customer must specify DMX512 or RDM

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September 25, 2019

## ■ Operation Area



| Model | C280   |        | C420   |        |
|-------|--------|--------|--------|--------|
| Item  | Io(mA) | Vo (V) | Io(mA) | Vo (V) |
| A     | 1400   | 286    | 2800   | 143    |
| B     | 2100   | 190    | 4200   | 95     |
| C     | 2100   | 114    | 4200   | 57     |
| D     | 210    | 114    | 420    | 57     |
| E     | 140    | 286    | 280    | 143    |
| F     | 840    | 286    | 1680   | 143    |
| G     | 2100   | 114    | 4200   | 57     |

## ■ 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          | 1.8 Amax@277Vac & Full-Load,<br>0.9Amax@480Vac & Full-Load                                                                                                                                                                                  |
| Inrush Current         | 65A peak, 1.2ms duration@277Vac , <0.25A2s<br>70A peak, 1.3ms duration@480Vac , <0.5A2s                                                                                                                                                     |
| Leakage Current        | 1mA max @277Vac 60Hz, UL8750, 0.75mAmax @380Vac 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 $T_c \leq 70 \pm 10^\circ\text{C}$<br>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~+90°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             | 9.44x3.54x1.63 by inch (body), 10.51x3.54x1.63 by inch (endcaps included)<br>240x90x41.5 by mm (body), 267x90x41.5 by mm (endcaps included)                                                                                                 |
| Net Weight             | 1650g                                                                                                                                                                                                                                       |
| Packing                | 10pcs/Carton/19.2kg, 490x370x345mm                                                                                                                                                                                                          |

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.

### 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.

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## ■ 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                                               |

## ■ 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          |            |                     |
| DALI Interface Standard                            |                | IEC62386   |                     |
| DA1,DA2 High Level                                 | 9.5            | 16         | 22.5                |
| DA1,DA2 Low Level                                  | -6.5           | 0          | 6.5                 |
| DA1,DA2 Current                                    | 0              |            | 2mA                 |

Note: Dim-off function is only available in the models with 12Vaux power.

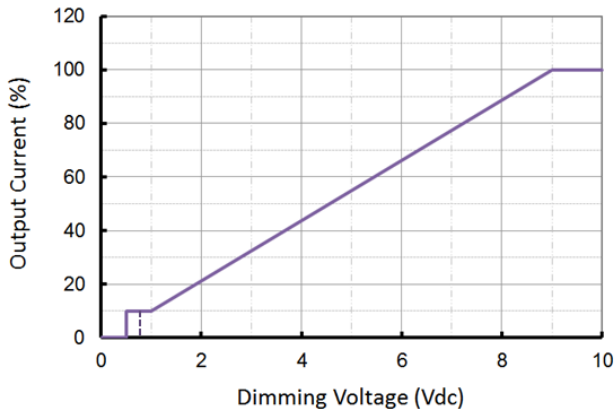
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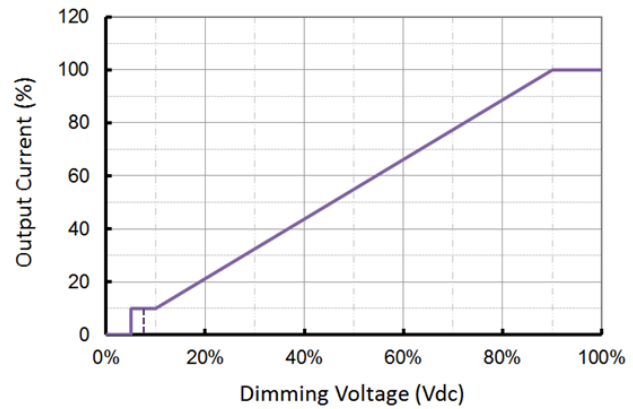
## ■ Dimming Curve

### a. With dim-off (default)

0-10V Dimming Curve

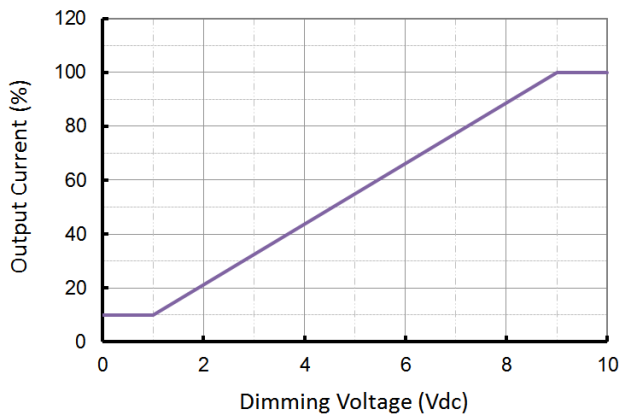


PWM Dimming Curve

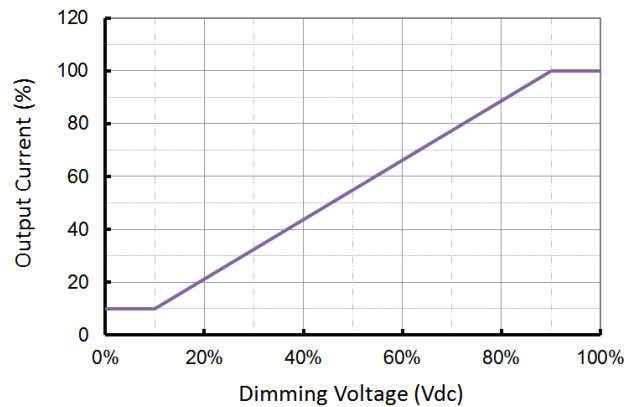


### b. Without dim-off (contact sales to get this feature)

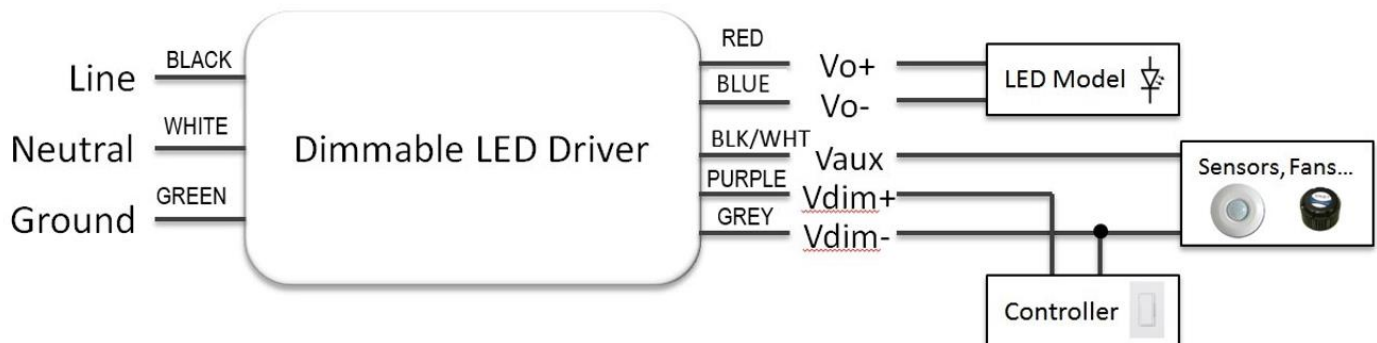
0-10V Dimming Curve



PWM Dimming Curve



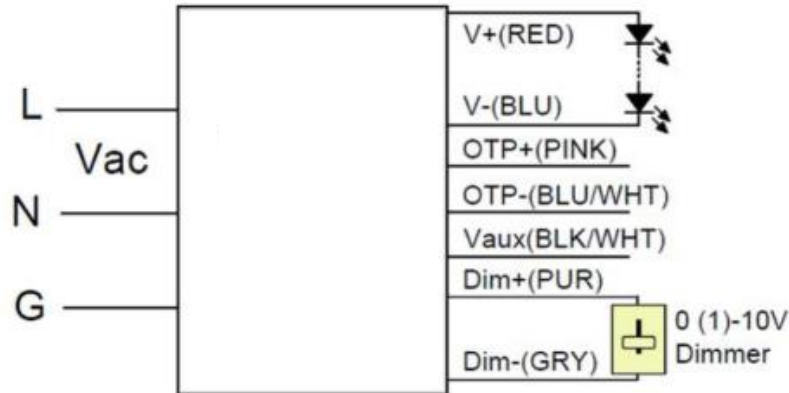
## ■ Wiring Diagram



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## ■ Wiring Diagram/Optional External Thermal Protection



## ■ External Thermal Protection Table

| 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%)                                                                           |

## ■ 41Near Field Communication Programmability



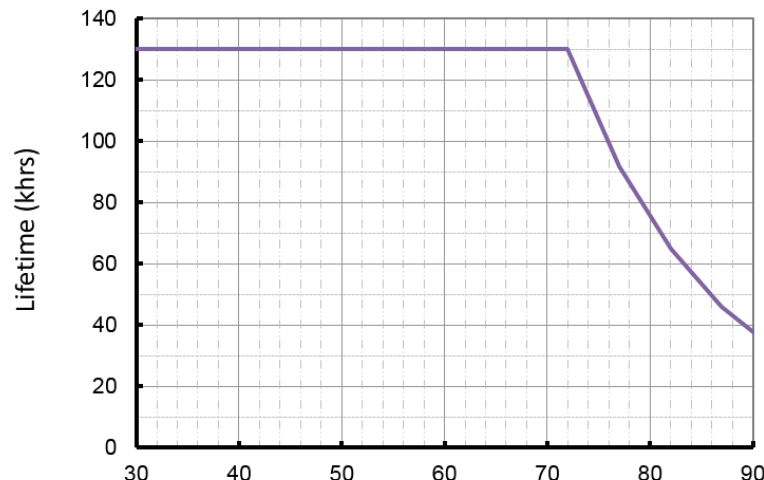
Programming Module  
REF. Part# UPRG-NFC

### 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 Autec Sales for User Guide and programming software for complete programming instructions.

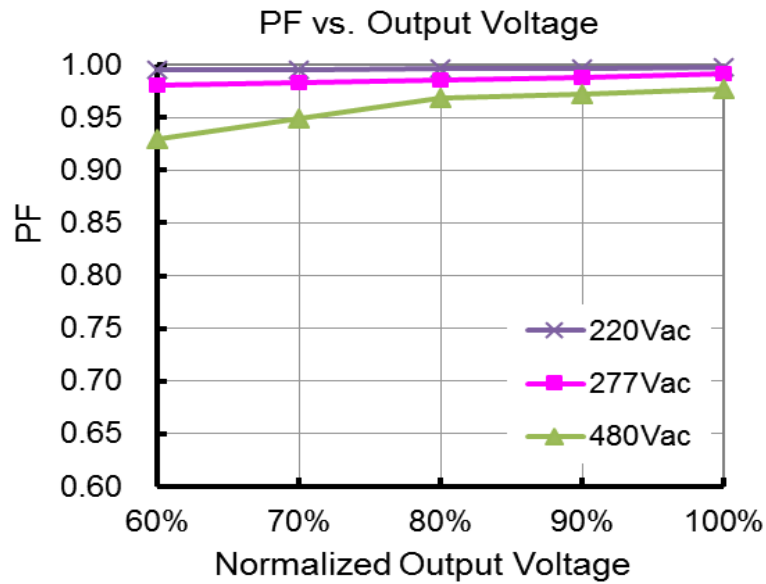
## ■ Lifetime vs. Case Temperature

Lifetime vs. Case Temperature

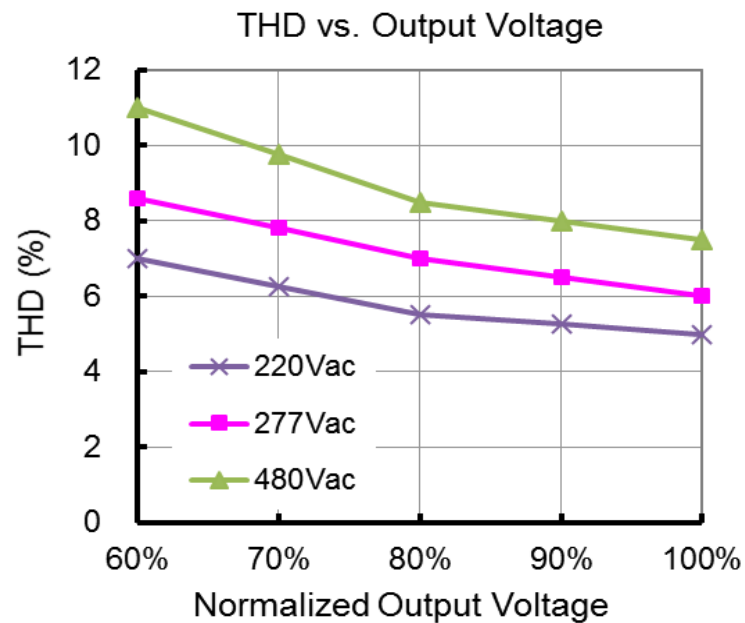


Case Temperature (°C)  
(End of Life: Maximum Failure Rate=10%)

## ■ Power Factor vs. Load

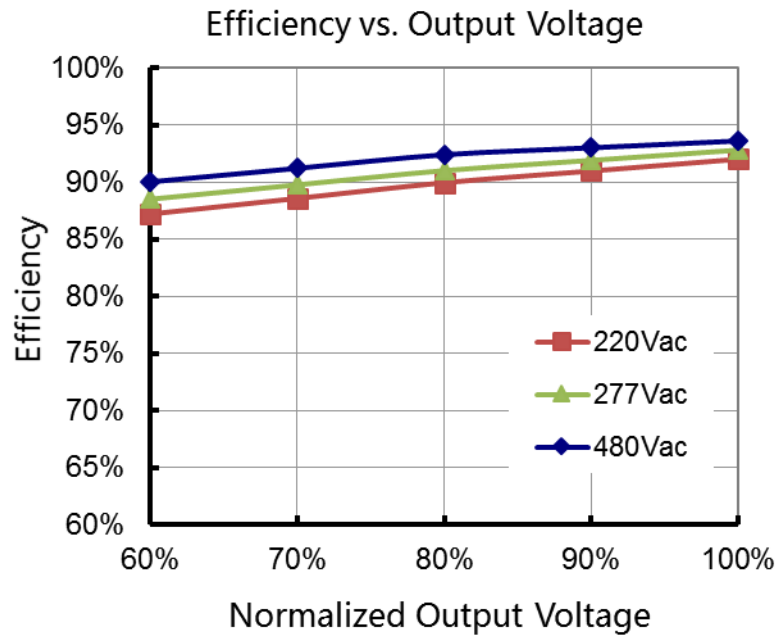


## ■ THD vs. Load

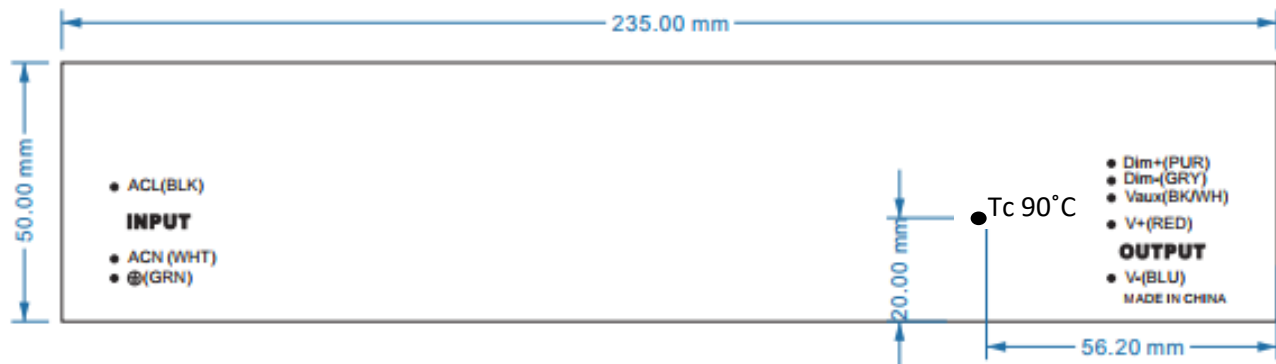




## ■ Efficiency vs. Load(4.2A Model)

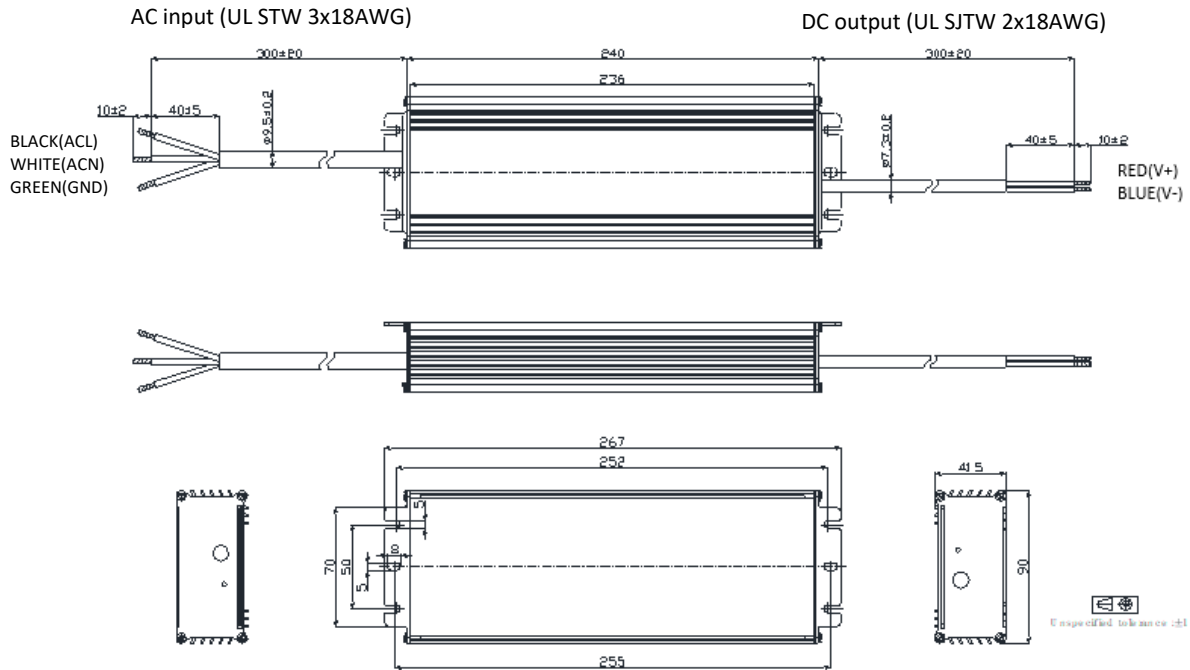


## ■ Tc Location(LED Driver Label)

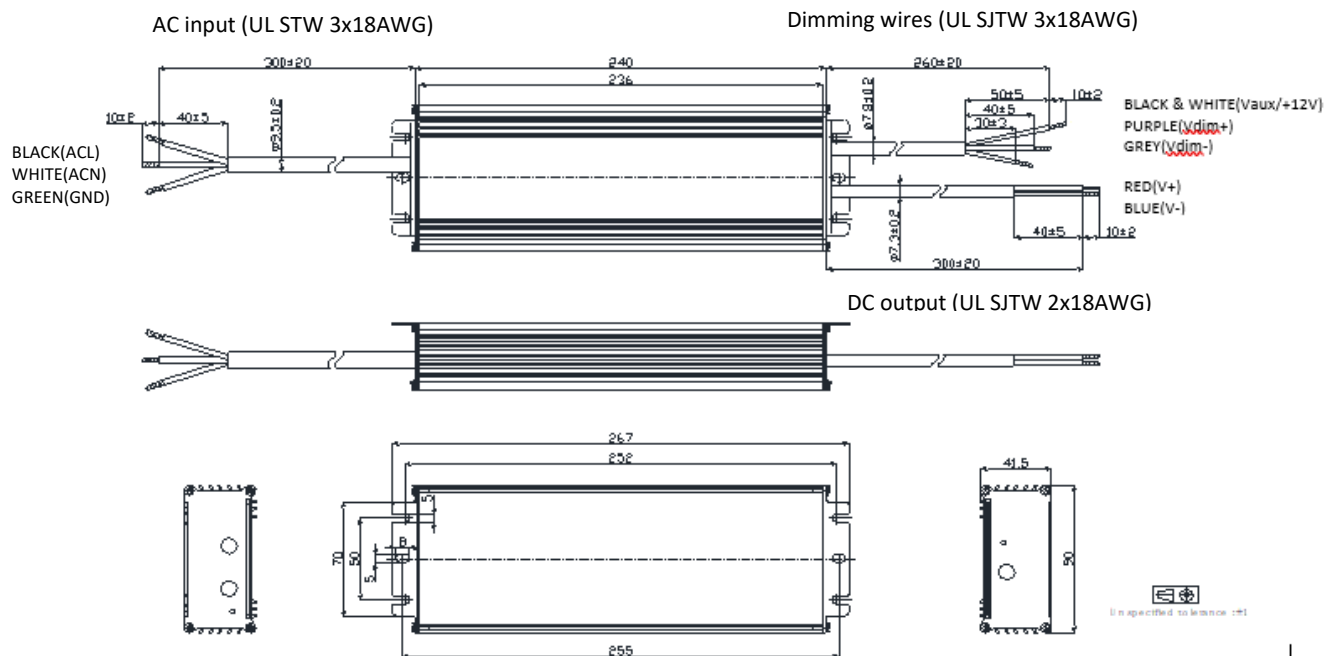


## ■ Mechanical Design

### - LHA400-Cxxx-NN/TRK (UL Cable)



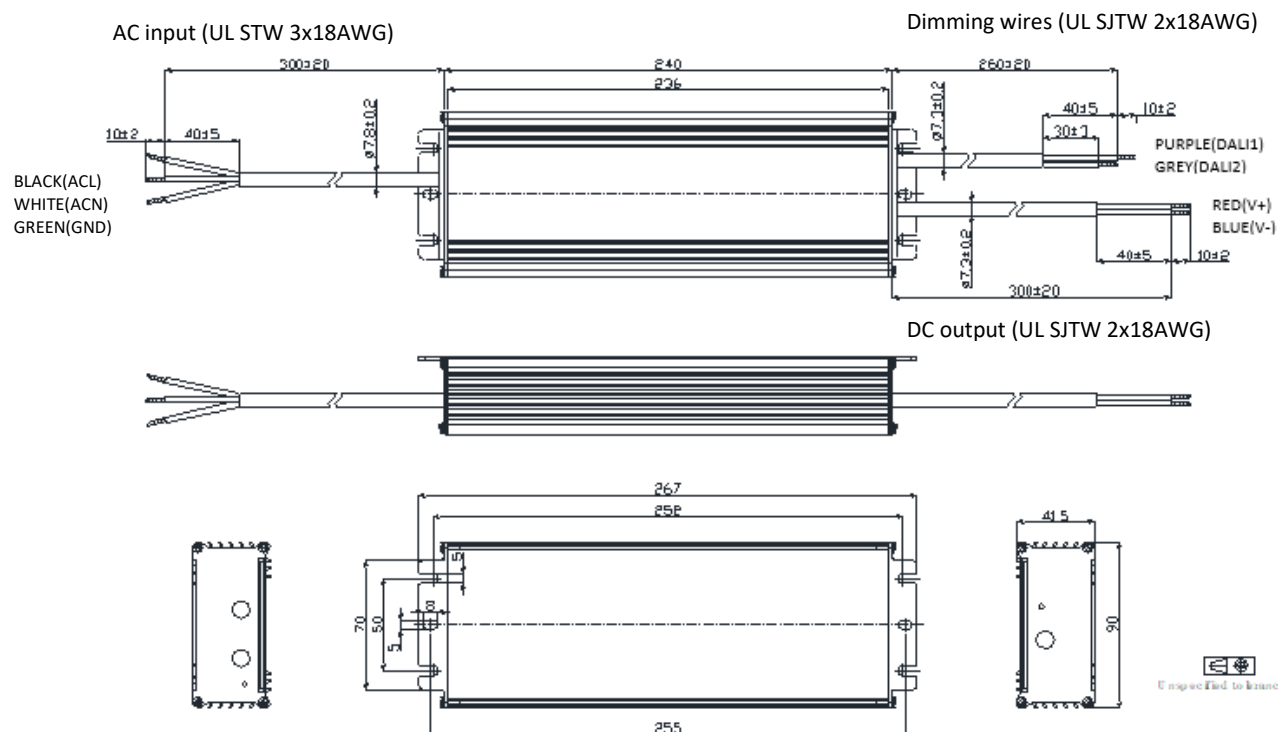
### - LHA400-Cxxx-ERK (UL Cable)



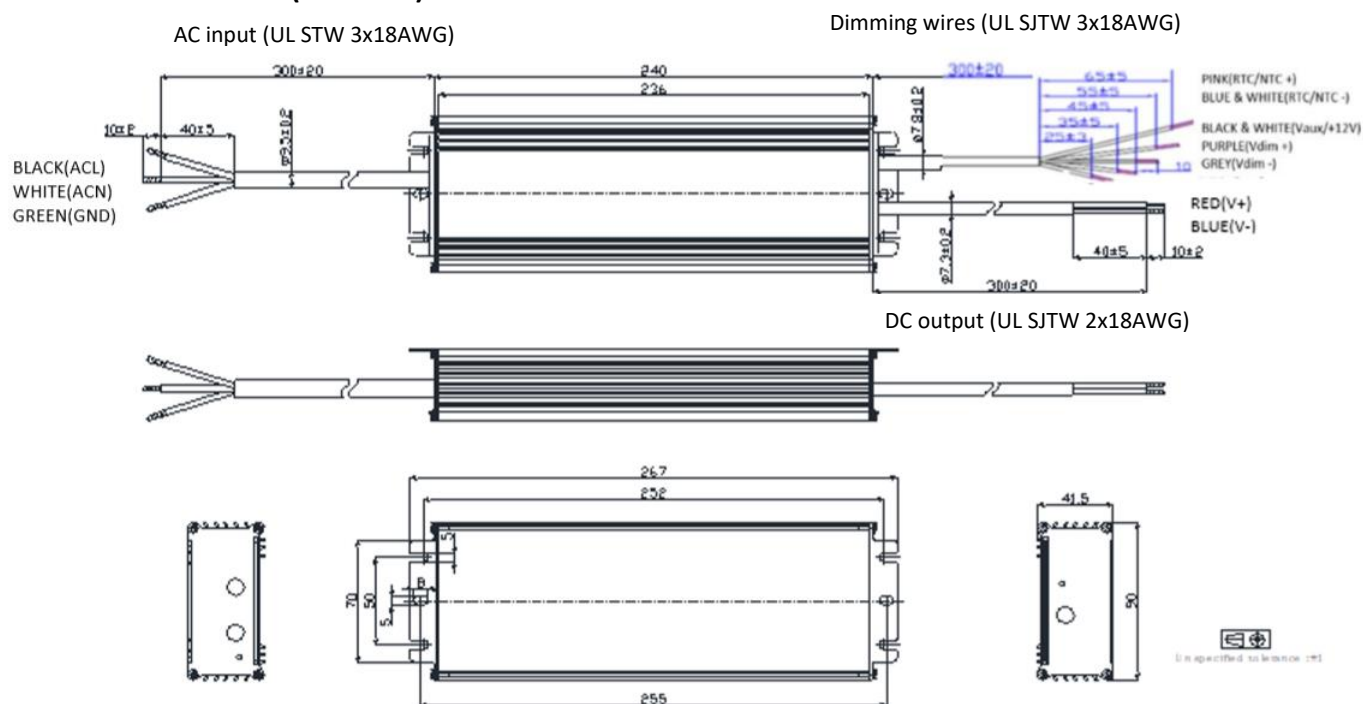
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- **LHA400-Cxxx-ANK (UL Cable)**



- **LHA400-Cxxx-ANK (UL Cable)**



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

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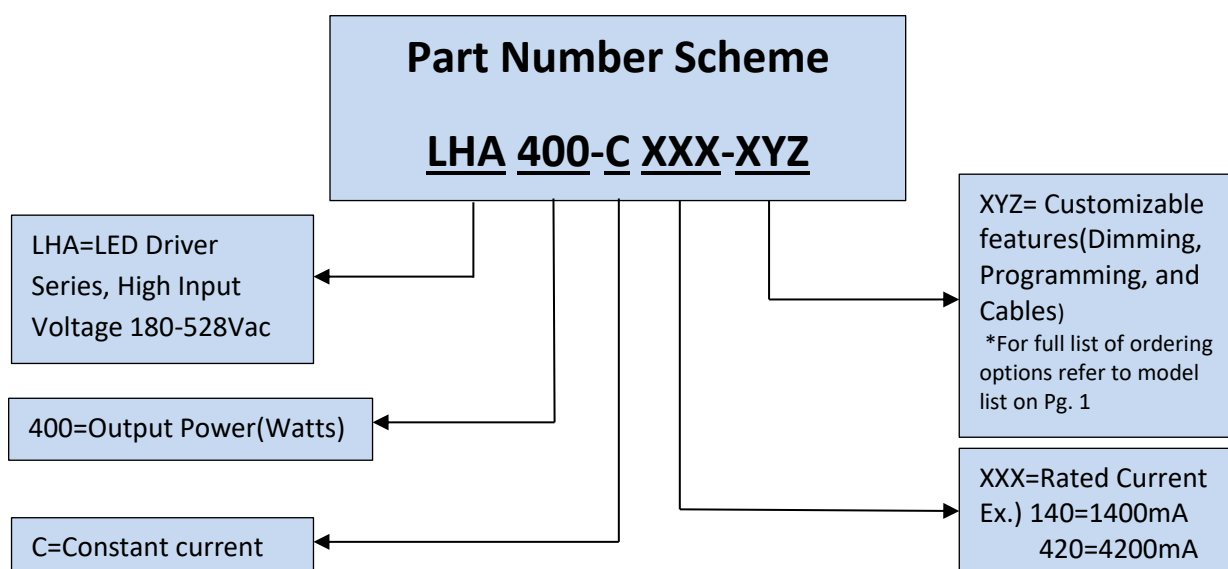
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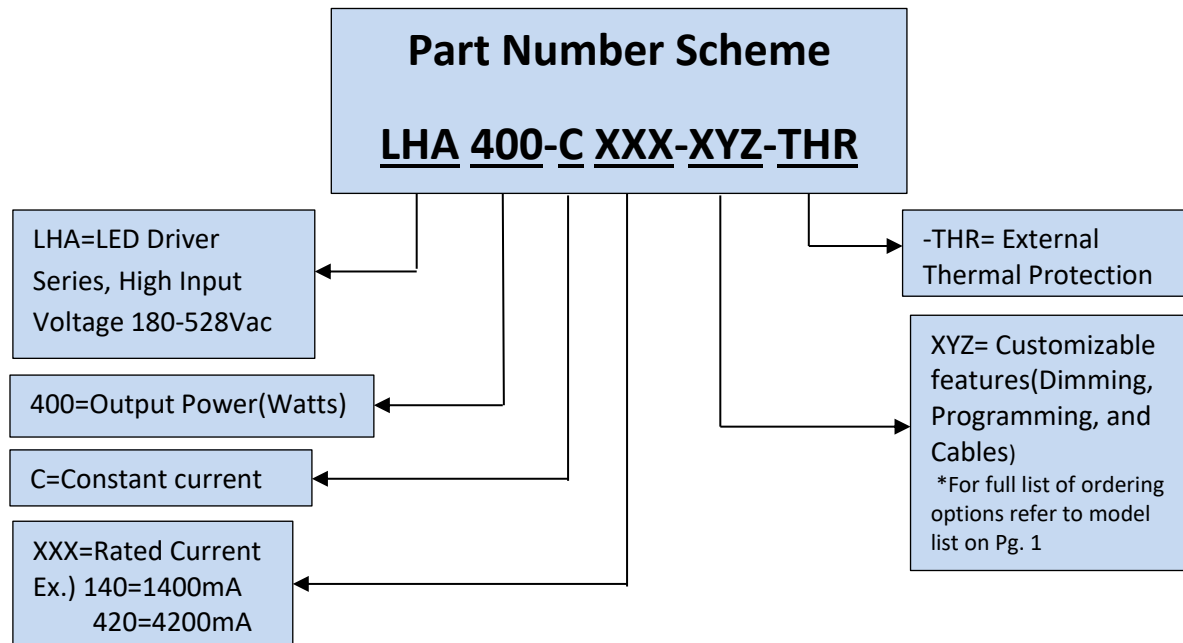
## ■ Operation Range

| Model       | Typical Set Output Current (mA) | Max Output Power (W) | Output Voltage Min (V) | Output Voltage Max(V) | Minimum Dimming Current (mA) |
|-------------|---------------------------------|----------------------|------------------------|-----------------------|------------------------------|
| LHA400-C210 | 2100                            | 400                  | 114                    | 190                   | 210                          |
|             | 2000                            | 400                  | 120                    | 200                   | 200                          |
|             | 1900                            | 400                  | 126                    | 211                   | 190                          |
|             | 1800                            | 400                  | 133                    | 222                   | 180                          |
|             | 1700                            | 400                  | 141                    | 235                   | 170                          |
|             | 1600                            | 400                  | 150                    | 250                   | 160                          |
|             | 1500                            | 400                  | 160                    | 267                   | 150                          |
|             | 1400                            | 400                  | 171                    | 286                   | 140                          |
|             | 1300                            | 371                  | 171                    | 286                   | 140                          |
|             | 1200                            | 343                  | 171                    | 286                   | 140                          |
|             | 1100                            | 314                  | 171                    | 286                   | 140                          |
|             | 1000                            | 286                  | 171                    | 286                   | 140                          |
|             | ...                             | ...                  | 171                    | 286                   | ...                          |
|             | 140                             | 40                   | 171                    | 286                   | 140                          |

| Model       | Typical Set Output Current (mA) | Max Output Power (W) | Output Voltage Min (V) | Output Voltage Max(V) | Minimum Dimming Current (mA) |
|-------------|---------------------------------|----------------------|------------------------|-----------------------|------------------------------|
| LHA400-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                          |
|             | 2600                            | 371                  | 86                     | 143                   | 280                          |
|             | ...                             | ...                  | 86                     | 143                   | ...                          |
|             | 280                             | 40                   | 86                     | 143                   | 280                          |

| Model       | Typical Set Output Current (mA) | Max Output Power (W) | Output Voltage Min (V) | Output Voltage Max(V) | Minimum Dimming Current (mA) |
|-------------|---------------------------------|----------------------|------------------------|-----------------------|------------------------------|
| LHA400-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                            | 400                  | 35                     | 58                    | 690                          |
|             | 6300                            | 400                  | 35                     | 58                    | 690                          |
|             | 6000                            | 400                  | 35                     | 58                    | 690                          |
|             | 5700                            | 400                  | 35                     | 58                    | 690                          |
|             | 5400                            | 379                  | 35                     | 58                    | 690                          |
|             | 5100                            | 358                  | 35                     | 58                    | 690                          |
|             | ...                             | ...                  | 35                     | 58                    | ...                          |
|             | 690                             | 48                   | 35                     | 58                    | 690                          |





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

**\*Specifications are subject to change without notice. Autec is not responsible for issues arising from errors or omissions.**