

## Features

- Ultra High Efficiency (Up to 95%)
- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 0-10V/10V PWM/Resistor Dimmable
- Dim-to-Low-Voltage(DTLV) with Standby Power  $\leq 0.5W$
- Maximum Dimming Level with 9V or 10V Selectable
- Fade-Time Adjustable
- Output Lumen Compensation
- End-of-Life Indicator
- Input Surge Protection: DM 6kV, CM 6kV
- All-Around Protection: OVP, SCP, OTP
- IP65 and UL Dry/Damp Location
- TYPE HL, for use in a Class I, Division 2 Hazardous (Classified) Location
- 5 Years Warranty



## Description

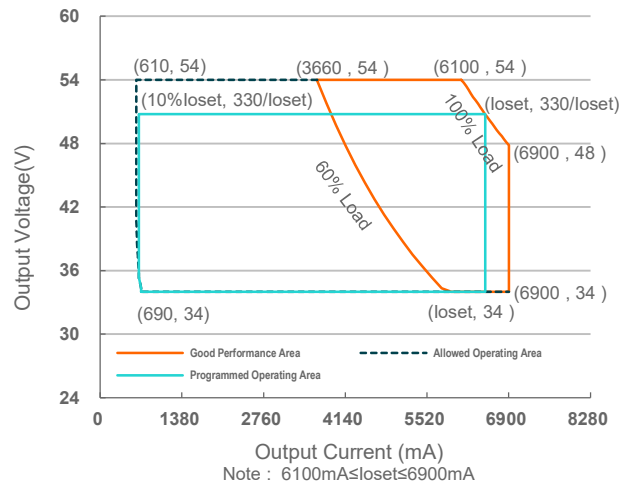
The SUM-330SxxxHF series is a 330W, constant-current, programmable and IP65 rated LED driver that operates from 90-305Vac input with excellent power factor. Created for many lighting applications including Horticulture, High bay, etc. The high efficiency of this driver enables it to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.

## Models

| Adjustable Output Current Range(mA) | Full-Power Current Range(mA) <sup>(1)</sup> | Default Output Current (mA) | Output Voltage Range(Vdc) | Max. O4output Power(W) | Typical Efficiency <sup>(2)</sup> | Typical Power Factor |        | Model Number <sup>(3)(4)</sup> |
|-------------------------------------|---|-----------------------------|---------------------------|------------------------|-----------------------------------|----------------------|--------|--------------------------------|
|                                     |   |                             |                           |                        |                                   | 120Vac               | 220Vac |                                |
| 610-6900                            | 6100-6900                                   | 6100                        | 34-54                     | 330                    | 95.0%                             | 0.99                 | 0.96   | SUM-330S690HF                  |

- Notes:** (1) Output current range with constant power at 330W.  
 (2) Measured at 100% load and 220Vac input (see below "General Specifications" for details).  
 (3) Certified input voltage range: UL, FCC 100-277Vac; otherwise: 100-240Vac.  
 (4) SELV output.

## I-V Operation Area



## Input Specifications

| Parameter                        | Min.    | Typ. | Max.                  | Notes  |
|----------------------------------|---------|------|-----------------------|--|
| Input AC Voltage                 | 90 Vac  | -    | 305 Vac               |  |
| Input DC Voltage                 | 127 Vdc | -    | 300 Vdc               |  |
| Input Frequency                  | 47 Hz   | -    | 63 Hz                 |  |
| Leakage Current                  | -       | -    | 0.75 MIU              | UL 8750; 277Vac/ 60Hz  |
|                                  | -       | -    | 0.70 mA               | IEC 60598-1; 240Vac/ 60Hz  |
| Input AC Current                 | -       | -    | 3.31 A                | Measured at 100% load and 120 Vac input.   |
|                                  | -       | -    | 1.79 A                | Measured at 100% load and 220 Vac input.   |
| Inrush Current(I <sup>2</sup> t) | -       | -    | 0.90 A <sup>2</sup> s | At 220Vac input, 25°C cold start, duration=6.52 ms, 10%I <sub>pk</sub> -10%I <sub>pk</sub> . |
| PF                               | 0.9     | -    | -                     | At 100-277Vac, 50-60Hz, 60%-100% load (198-330W)   |
| THD                              | -       | -    | 20%                   |  |
| THD                              | -       | -    | 10%                   | At 220-240Vac, 50-60Hz, 75%-100% load (248-330W)   |

## Output Specifications

| Parameter  | Min.     | Typ. | Max.    | Notes                  |
|--|----------|------|---------|------------------------|
| Output Current Tolerance                         | -5%loset | -    | 5%loset | At 100% load condition |
| Output Current Setting(I <sub>0set</sub> ) Range |          |      |         |                        |
| SUM-330S690HF                                    | 610 mA   | -    | 6900 mA |                        |
| Output Current Setting Range with Constant Power |          |      |         |                        |
| SUM-330S690HF                                    | 6100 mA  | -    | 6900 mA |                        |

## Output Specifications (Continued)

| Parameter                                    | Min. | Typ.                | Max.                 | Notes   |
|--|------|---------------------|----------------------|---|
| Total Output Current Ripple (pk-pk)          | -    | 5%I <sub>omax</sub> | 10%I <sub>omax</sub> | At 100% load condition. 20 MHz BW   |
| Output Current Ripple at < 200 Hz (pk-pk)    | -    | 2%I <sub>omax</sub> | -                    | At 100% load condition. Only this component of ripple is associated with visible flicker. |
| Startup Overshoot Current                    | -    | -                   | 10%I <sub>omax</sub> | At 100% load condition  |
| No Load Output Voltage<br>SUM-330S690HF      | -    | -                   | 60 V                 |   |
| Line Regulation                              | -    | -                   | ±0.5%                | Measured at 100% load   |
| Load Regulation                              | -    | -                   | ±3.0%                |   |
| Turn-on Delay Time                           | -    | -                   | 0.5 s                | Measured at 120-277Vac input, 60%-100%load  |
| Temperature Coefficient of I <sub>oset</sub> | -    | 0.03%/°C            | -                    | Case temperature = 0°C ~T <sub>c</sub> max  |

## General Specifications

| Parameter   | Min.                                     | Typ.           | Max.   | Notes  |
|---|--|----------------|--------|--|
| Efficiency at 120 Vac input:<br>SUM-330S690HF<br>I <sub>o</sub> =6100 mA<br>I <sub>o</sub> =6900 mA | 91.0%<br>91.0%                           | 93.0%<br>93.0% | -<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 220 Vac input:<br>SUM-330S690HF<br>I <sub>o</sub> =6100 mA<br>I <sub>o</sub> =6900 mA | 93.0%<br>92.5%                           | 95.0%<br>94.5% | -<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 277 Vac input:<br>SUM-330S690HF<br>I <sub>o</sub> =6100 mA<br>I <sub>o</sub> =6900 mA | 93.0%<br>93.0%                           | 95.0%<br>95.0% | -<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Standby Power   | -  | -              | 0.5 W  | Measured at 230Vac/50Hz; Dimming off   |
| MTBF  | -  | 229,000 Hours  | -      | Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)   |
| Lifetime  | -  | 103,000 Hours  | -      | Measured at 220Vac input, 80%load and 70°C case temperature; See lifetime vs. T <sub>c</sub> curve for the details                               |
|   | -  | 84,000 Hours   | -      | Measured at 120Vac input, 100%load and 40°C ambient temperature;   |
| Operating Case Temperature for Safety T <sub>c_s</sub>  | -40°C                                    | -              | +90°C  |  |
| Operating Case Temperature for Warranty T <sub>c_w</sub>  | -40°C                                    | -              | +80°C  | Case temperature for 5 years warranty<br>Humidity: 10% RH to 95% RH  |
| Storage Temperature   | -40°C                                    | -              | +85°C  | Humidity: 5%RH to 95%RH  |
| Dimensions<br>Inches (L × W × H)<br>Millimeters (L × W × H)   | 14.65 × 1.71 × 1.24<br>372 × 43.5 × 31.5 |                |        | With mounting ear<br>15.59 × 1.71 × 1.24<br>396 × 43.5 × 31.5  |
| Net Weight  | -  | 1110 g         | -      |  |

## Dimming Specifications

| Parameter                                    |               | Min.       | Typ.        | Max.        | Notes                                |
|--|---------------|------------|-------------|-------------|--------------------------------------|
| Absolute Maximum Voltage on the Vdim (+) Pin |               | -20 V      | -           | 20 V        |                                      |
| Source Current on Vdim (+)Pin                |               | 90 $\mu$ A | 100 $\mu$ A | 110 $\mu$ A | Vdim(+) = 0 V                        |
| Dimming Output Range                         | SUM-330S690HF | 10%loset   | -           | loset       | 6100 mA $\leq$ loiset $\leq$ 6900 mA |
| Recommended Dimming Input Range              |               | 0 V        | -           | 10 V        | Default 0-10V dimming mode.          |
| Dim off Voltage                              |               | 0.35 V     | 0.5 V       | 0.65 V      |                                      |
| Dim on Voltage                               |               | 0.55 V     | 0.7 V       | 0.85 V      |                                      |
| Hysteresis                                   |               | -          | 0.2 V       | -           |                                      |
| PWM_in High Level                            |               | -          | 10 V        | -           |                                      |
| PWM_in Low Level                             |               | -          | 0 V         | -           |                                      |
| PWM_in Frequency Range                       |               | 200 Hz     | -           | 3 KHz       |                                      |
| PWM_in Duty Cycle                            |               | 0%         | -           | 100%        |                                      |
| PWM Dimming off                              |               | 3%         | 5%          | 8%          |                                      |
| PWM Dimming on                               |               | 5%         | 7%          | 10%         |                                      |
| Hysteresis                                   |               | -          | 2%          | -           |                                      |

## Safety & EMC Compliance

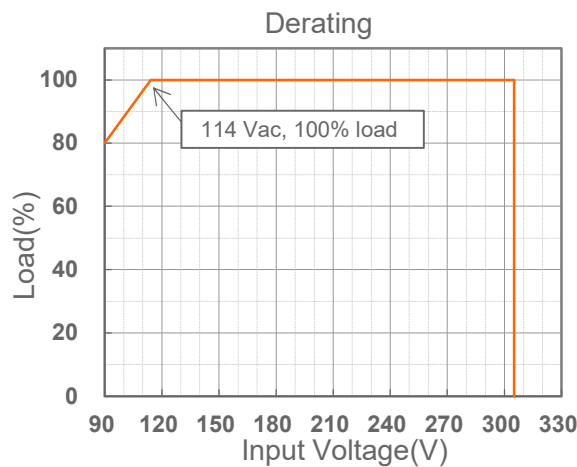
| Safety Category             | Standard  |
|-----------------------------|---|
| UL/CUL                      | UL 8750,CAN/CSA-C22.2 No. 250.13  |
| CE                          | EN 61347-1, EN 61347-2-13   |
| CB                          | IEC 61347-1, IEC 61347-2-13   |
| EMI Standards               | Notes   |
| EN IEC 55015 <sup>(1)</sup> | Conducted emission Test &Radiated emission Test   |
| EN IEC 61000-3-2            | Harmonic current emissions  |
| EN 61000-3-3                | Voltage fluctuations & flicker  |
| FCC Part 15 <sup>(1)</sup>  | ANSI C63.4 Class B  |
|                             | This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation. |

## Safety & EMC Compliance (Continued)

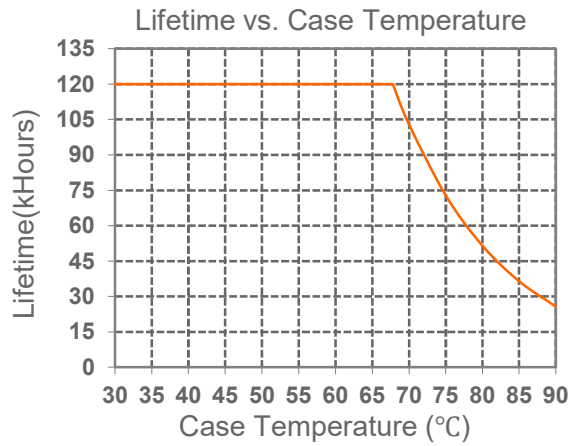
| EMS Standards  | Notes  |
|----------------|--|
| EN 61000-4-2   | Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge    |
| EN 61000-4-3   | Radio-Frequency Electromagnetic Field Susceptibility Test-RS                 |
| EN 61000-4-4   | Electrical Fast Transient / Burst-EFT  |
| EN 61000-4-5   | Surge Immunity Test: AC Power Line: Differential Mode 6 kV, Common Mode 6 kV |
| EN 61000-4-6   | Conducted Radio Frequency Disturbances Test-CS                               |
| EN 61000-4-8   | Power Frequency Magnetic Field Test  |
| EN 61000-4-11  | Voltage Dips   |
| EN 61547       | Electromagnetic Immunity Requirements Applies To Lighting Equipment          |
| ANSI Standards | Notes  |
| ANSI C82.77-5  | 6kV combi-wave surge rating to comply with ANSI C82.77-5 CAT low             |

**Note:** (1) This LED driver meets the EMI specifications above, but EMI performance of a Luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

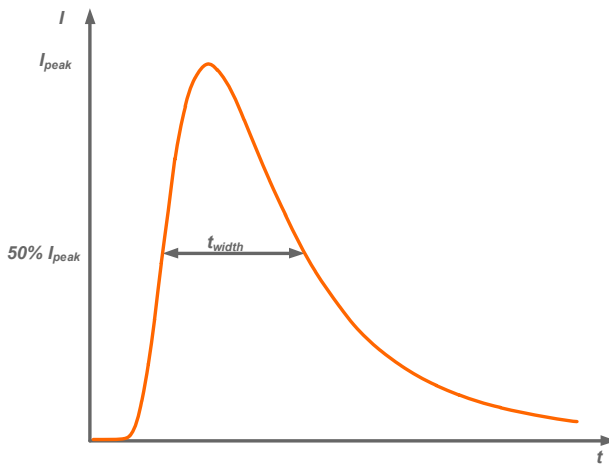
## Derating



## Lifetime vs. Case Temperature



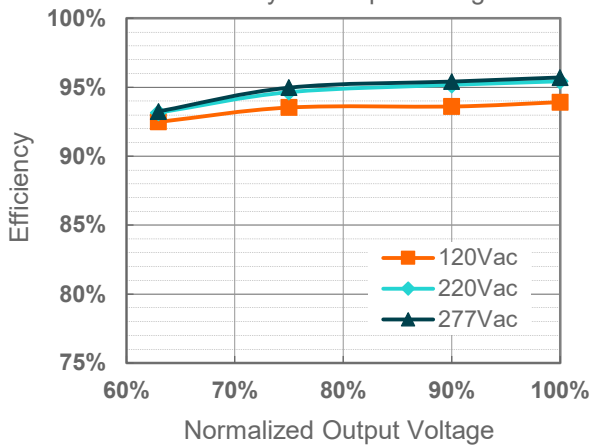
## Inrush Current Waveform



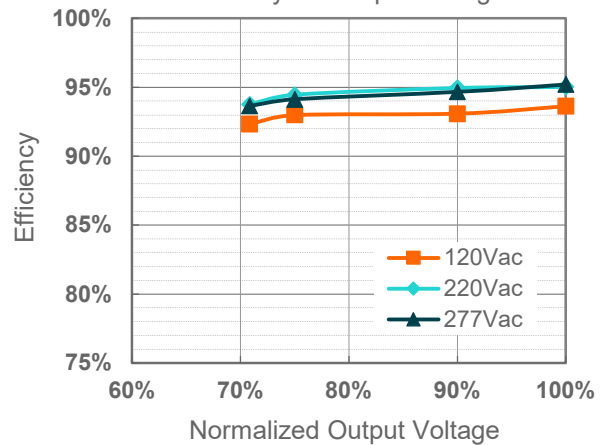
| Input AC Voltage | $I_{peak}$ | $t_{width}$<br>(@ 50% $I_{peak}$ ) |
|------------------|------------|------------------------------------|
| 220Vac           | 13.6A      | 1.68ms                             |

## Efficiency vs. Load

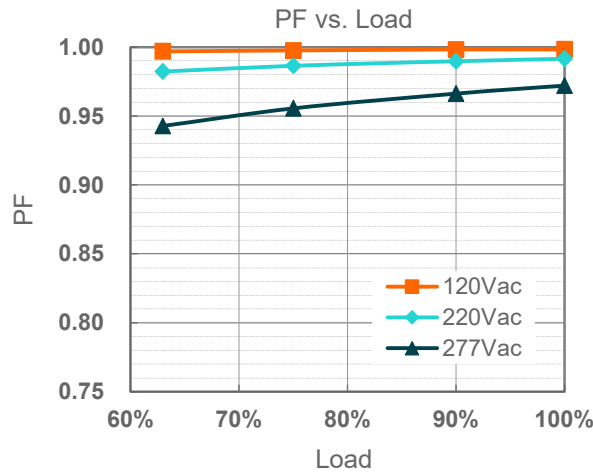
SUM-330S690HF ( $I_o=6100mA$ )  
Efficiency vs. Output Voltage



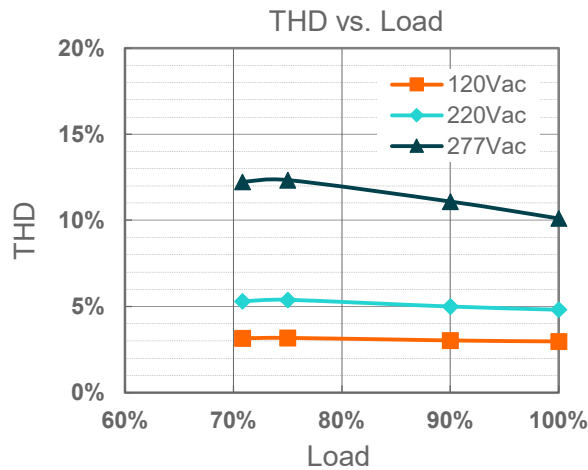
SUM-330S690HF ( $I_o=6900mA$ )  
Efficiency vs. Output Voltage



## Power Factor



## Total Harmonic Distortion



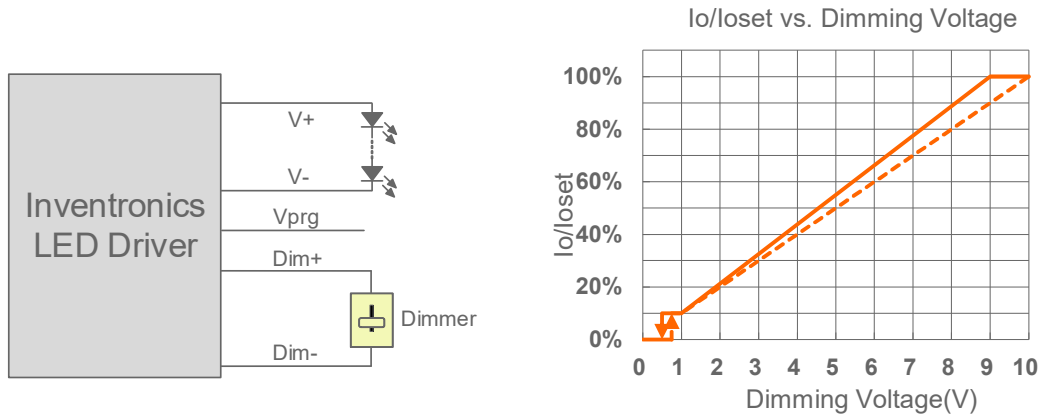
## Protection Functions

| Parameter                   | Notes  |
|-----------------------------|--|
| Over Voltage Protection     | Limits output voltage at no load and in case the normal voltage limit fails.   |
| Short Circuit Protection    | Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed. |
| Over Temperature Protection | Decreases output current , returning to normal after over temperature is removed.  |

## Dimming

### ● 0-10V Dimming

The recommended implementation of the dimming control is provided below.



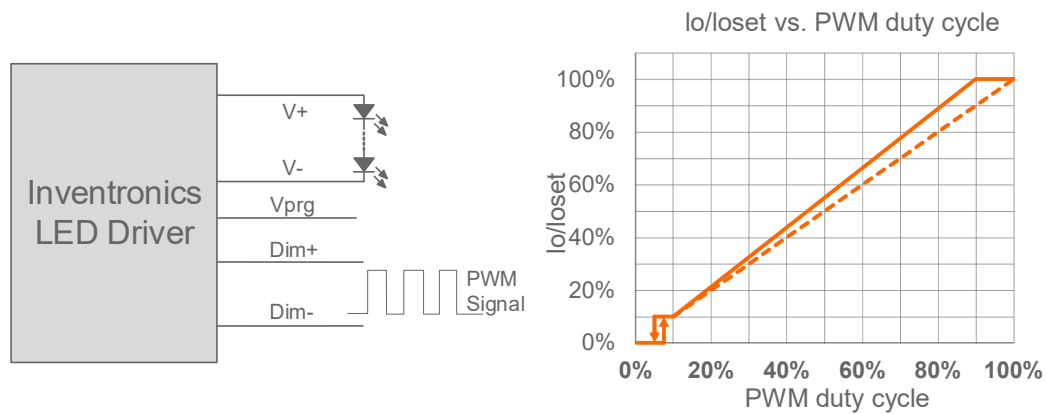
**Implementation 1: Positive logic**

**Notes:**

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like zener.

### ● 10V PWM Dimming

The recommended implementation of the dimming control is provided below.

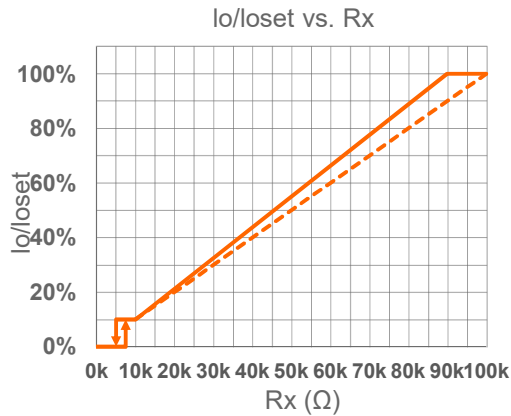
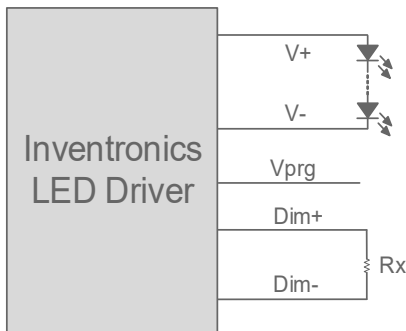


**Implementation 2: Positive logic**

**Notes:** Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.

## ● Resistor Dimming

The recommended implementation of the dimming control is provided below.



### Implementation 3: Positive logic

**Notes:** Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.

## ● Output Lumen Compensation

Output Lumen Compensation (OLC) may be used to maintain constant light output over the life of the LEDs by driving them at a reduced current when new, then gradually increasing the drive current over time to counteract LED lumen degradation.

## ● Maximum Dimming Level with 9V or 10V Selectable

The maximum dimming level can be set as corresponding dimming voltage is 9V or 10V by Inventronics Multi Programmer, 9V is default.

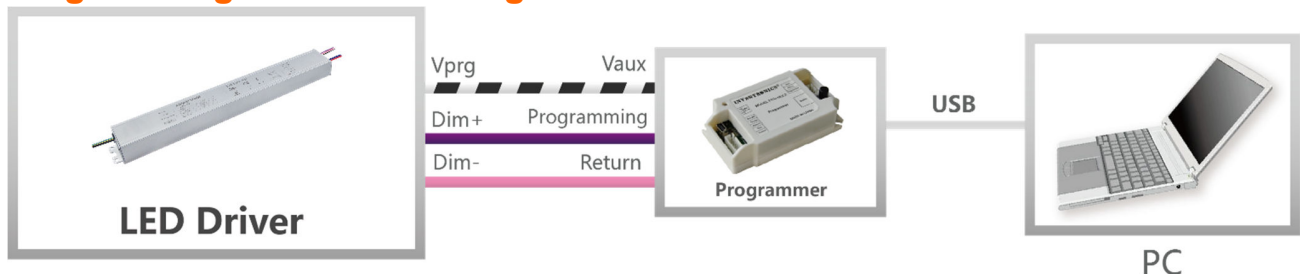
## ● Fade Time Adjustable

Soft-start time and dimming slope can be adjusted by Inventronics Multi Programmer to get customized fade time experience, disable mode is default.

## ● End Of Life

End-of-Life (EOL) is providing a visual notification to a user that the LED module has reached the end of manufacturer-specified life and that the replacement is recommended. Once active, an indication is given at each power-up of the driver, which the driver indicates this through a lower light output during the first 1 minute before normal operation is continued.

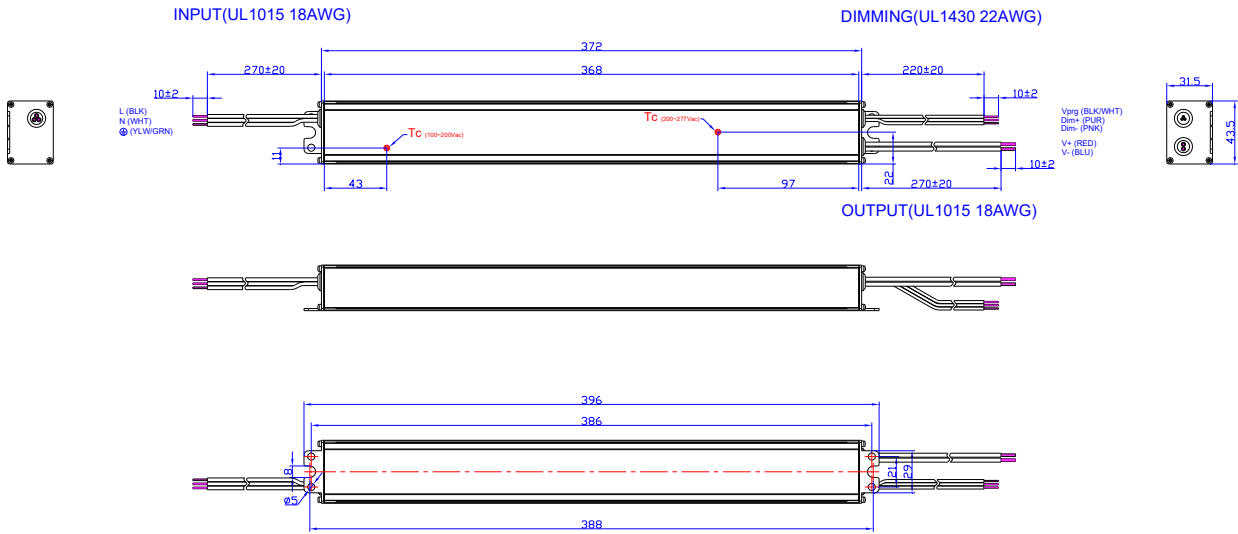
## Programming Connection Diagram



**Note:** The driver does not need to be powered on during the programming process.

- Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.

## Mechanical Outline



Unspecified tolerance: ±1

## RoHS Compliance

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

## Revision History

| Change Date | Rev. | Description of Change   |      |         |
|-------------|------|-------------------------|------|---------|
|             |      | Item                    | From | To      |
| 2022-05-27  | A    | Datasheet Release       | /    | /       |
| 2026-04-03  | B    | Format                  | /    | Updated |
|             |      | Product photograph      | /    | Updated |
|             |      | Safety & EMC Compliance | /    | Updated |