

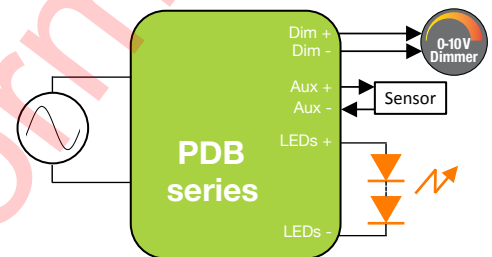
### Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

Nominal Input Voltage	Max. Output Power	Output Voltage	Output Current	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range
120 to 277 Vac	260 W	114 to 400 Vdc	325 mA to 1700 mA CC	up to 93% typical	90°C (measured at the hot spot)	< 20%	> 0.9	0 - 10V	1 - 100% (% of Iout)



**Aluminum Case:**  
L 214.4/240 x W 50.8 x H 38.5 mm  
(L 8.44/9.47 x W 2.00 x H 1.52 in)

CC: Constant Current



Typical Application Diagram

#### ORDERING INFORMATION

Ordering Part Number	Nominal Input Voltage (Vac)	Max Output Power (W)	Iout 1 (mA)	Vout 1 Min. (Vdc)	Vout 1 Nom. (Vdc)	Vout 1 Max. (Vdc)	Open Loop (no load) Voltage 1 (Vdc)	Iout 2 (mA)	Vout 2 Min. (Vdc)	Vout 2 Nom. (Vdc)	Vout 2 Max. (Vdc)	Open Loop (no load) Voltage 2 (Vdc)
PDB260W-0860-400	120 to 277	260	430 to 860	228	270	300	390	325 to 650	304	360	400	500
PDB260W-1300-280	120 to 277	260	650 to 1300	152	180	200	260	465 to 930	213	252	280	350
PDB260W-1700-210	120 to 277	260	850 to 1700	114	135	150	195	620 to 1240	160	189	210	250

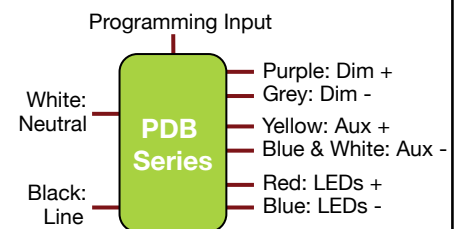
For additional options of output current and output voltage, contact your sales representative or send an email to: [SaveEnergy@ERP-Power.com](mailto:SaveEnergy@ERP-Power.com)

#### FEATURES

##### • Programmable Features

- Current: 100% to 50% in each voltage range
- Output voltage range selection
- Data log read: SKU, S/N, lot code, hours of operation, FW rev., fault events: power failure, transients (short or surge), thermal events
- Non-linear 0-10V dimming profile with dim-to-off (10V to 9.1V=100%, 1.5V to 0.6V=1%, <0.6V=dim-to-off)
- Auxiliary output 12 V/100 mA
- Dual output voltage range
- IP66-rated case with silicone-based potting
- Surge protection:
  - Combination wave IEC61000-4-5: 4 kV line to line/4 kV line to earth (higher surge is available upon request)
  - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- 90°C maximum case hot spot temperature
- Complies with ENERGY STAR® luminaire specification and DLC (Design Light Consortium®) technical requirements
- UL Class P
- Worldwide safety approvals

UL US FC CE CB



Wiring Diagram

#### TYPICAL APPLICATIONS

- Outdoor & Indoor
- Street lights, Area lights
- Horticulture grow lights
- Industrial high-bay lights



### Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

#### 1 - INPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	90	120, 230, 277	305	• The rated output current for each model is achieved at Vin ≥ 108 Vac & at Vin ≥ 198 Vac • At nominal load
Input Frequency Range	Hz	47	50/60	63	
Power Factor (PF)		0.9	> 0.9		• At nominal input voltage and with nominal LED voltage • From 100% to 50% of rated power
Inrush Current	A	Meets NEMA-410 requirements			• At any point on the sine wave and 25°C • Active limiting inrush current is available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.
Leakage Current	µA			0.5 mA @ 120 Vac 1 mA @ 230 Vac 1.2 mA @ 277 Vac	Measured per IEC60950-1
Total Harmonics Distortion (THD)				20%	• At nominal input voltage and nominal LED voltage • From 100% to 50% of rated power • Complies with DLC (Design Light Consortium) technical requirements
Efficiency	%	-	up to 93%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer attached.
Isolation	• The AC input to the main output is Class I (with earth ground). • The AC input to the 0-10V output and to the Auxiliary output is Class II.				
Standby Power				0.5 W @ 120 Vac	Measured with the following conditions: LED load off, no load on the auxiliary CV output, and dim-to-off.

#### 2 - MAIN OUTPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc	114		400	See ordering information for details
Output Current (Iout)	mA	325		1700	• See ordering information for details • The rated output current for each model is achieved at Vin ≥ 108 Vac & at Vin ≥ 198 Vac.
Output Current Regulation	%	-5	±2.5	5	• At nominal AC line voltage • Includes load and current set point variations
Output Current Overshoot	%	-	-	10	The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer.
Ripple Current		≤ 30% of rated output current for each model			• Measured at nominal LED voltage and nominal input voltage without dimming • Calculated in accordance with the IES Lighting Handbook, 9th edition • The PDB260 series is also available with lower ripple <10%, as an option. Contact your ERP representative or send an email to SaveEnergy@erp-power.com.
Dimming Range (% of Iout)	%	1		100	• The dimming range is dependent on each specific dimmer. It may not be able to achieve 1% dimming with some dimmers. • Dimming performance is optimal when the driver is operated at its nominal output voltage matching the LED nominal Vf (forward voltage). Dimming performance may vary when the driver is operated near its minimum output voltage.
Start-up Time	ms			750	• Measured from application of AC line voltage to 100% light output • Complies with ENERGY STAR® luminaire specification
Isolation	The AC input to main output is Class I (with earth ground)				

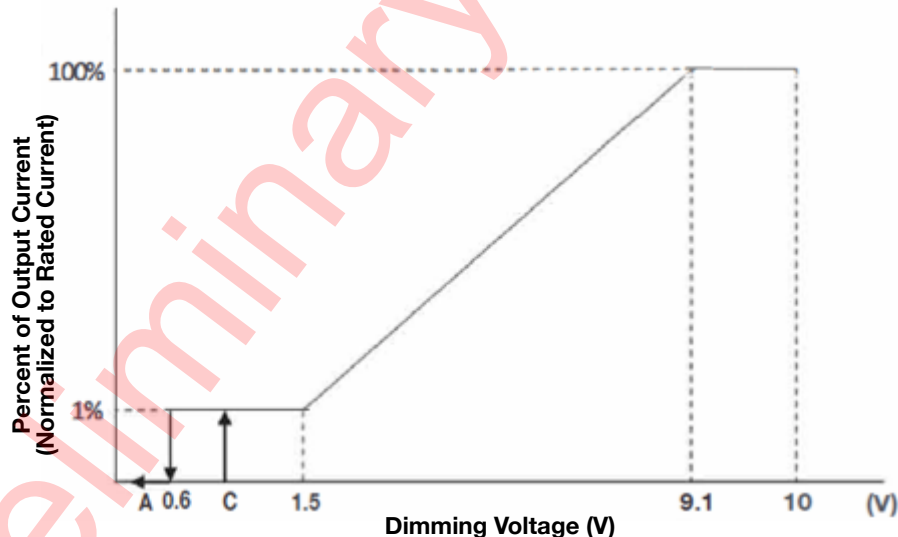
#### 3 - AUXILIARY OUTPUT, 12 V / 100 mA, SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc	10.8	12	13	Other voltages (5 V, 24 V) and currents are available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com
Output Current (Iout)	mA		100		
Isolation from LED Output	Meets Class II reinforced/double insulation power supply <input type="checkbox"/>				
Isolation from AC Input	Meets Class II reinforced/double insulation power supply <input type="checkbox"/>				

## Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

### 4 - 0-10 V DIMMING CONTROL (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
<b>+Dim Signal, -Dim Signal</b>		The PDB260 series operate only with 0-10V dimmers that sink current. The method to dim the output current of the driver is done via the +Dim/-Dim signal pins. The +Dim/-Dim signal pins can be used to adjust the output setting via a standard commercial wall dimmer, an external control voltage source (0 to 10 Vdc), or a variable resistor when using the recommended number of LEDs. The dimming input permits 1% to 100% dimming.			
<b>Dimming Profile (see figure 1)</b>		100% of output current between 10 V and 9.1 V, Linear between 9.1 V and 1.5 V, 1% of output current between 1.5 V and 0.6 V, Output current off below 0.6 V.			
<b>Dimming Range</b>	%	1		100	As a percent of the output current
<b>High Level Voltage</b>	V		9.1		
<b>Low Level Voltage</b>	V		1.5		
<b>Dim to Off</b>	V		0.6		
<b>Current Supplied by the +Dim Signal Pin</b>	mA			1	
<b>Output Current Tolerance While Being Dimmed</b>	%			±8	The tolerance of the output current while being dimmed is ≤ ±8% until down to 1.5V.
<b>Isolation</b>	The 0-10 V circuit is isolated from both the AC input and the main DC output and meets Class II reinforced/double insulation power supply. <input type="checkbox"/>				



Dimming Voltage	Description	Value
A	in standby	< 600 mV
C	out of standby, hysteresis	> 700 mV, < 800 mV

Figure 1

### Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

#### 5 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
Operating Ambient Temperature (Ta)	°C	-40		50	50°C is the non-derated temperature (Refer to section 8 "Output power de-rating at higher temperatures").
Maximum Case Temperature (Tc)	°C			+90	Case temperature measured at the hot spot •tc (see label in page 9)
Storage Temperature	°C	-40		+85	
Humidity	%	5	-	95	Non-condensing
Cooling	Convection cooled				
Acoustic Noise	dBA			22	Measured at a distance of 1 meter, without and with approved dimmers
Mechanical Shock Protection	per EN60068-2-27				
Vibration Protection	per EN60068-2-6 & EN60068-2-64				
MTBF	> 200,000 hours when operated at nominal input and output conditions, and at Tc ≤ 70°C				
Lifetime	50,000 hours at Tc ≤ 70°C maximum case hot spot temperature (see hot spot •tc on label in page 10)				

#### 6 - EMC COMPLIANCE AND SAFETY APPROVALS

EMC Compliance					
Conducted and Radiated EMI		•FCC CFR Title 47 Part 15 Class A at 120 Vac and at 277 Vac, •EN55015 (CISPR 15) Class A compliant at 220, 230, and 240 Vac			
Voltage Fluctuations & Flicker		IEC61000-3-3			
Immunity Compliance	ESD (Electrostatic Discharge)	IEC61000-4-2	6 kV contact discharge, 8 kV air discharge, level 3		
	RF Electromagnetic Field Susceptibility	IEC61000-4-3	3 V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters		
	Electrical Fast Transient	IEC61000-4-4	± 2 kV on AC power port for 1 minute, ±1 kV on signal/control lines		
	Surge	IEC61000-4-5	•± 4 kV line to line (differential mode) /± 4 kV line to common mode ground (tested to secondary ground) on AC power port, ±0.5 kV for outdoor cables •Higher surge is available. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.		
	Conducted RF Disturbances	IEC61000-4-6	3V, 0.15-80 MHz, 80% modulated		
	Voltage Dips	IEC61000-4-11	>95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods		
Transient Protection	Ring Wave	ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave			
Safety Agency Approvals					
UL	UL8750 recognized				
cUL	CAN/CSA C22.2 No. 250.13-14 LED equipment for lighting applications				
CE	IEC61347-2-13 electronic control gear for LED Modules				
Safety					
	Units	Minimum	Typical	Maximum	Notes
Hi Pot (High Potential) or Dielectric voltage-withstand	Vdc	2500			•Insulation between the input (AC line and Neutral) and the output •Tested at the RMS voltage equivalent of 1767 Vac

# Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

## 7 - PROTECTION FEATURES

### Under-Voltage (Brownout)

The PDB260 series provides protection circuitry such that an application of an input voltage below the minimum stated in section 1 (Input Specification) shall not cause damage to the driver.

### Short Circuit and Over Current Protection

The PDB260 series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

### Internal Over temperature Protection

The PDB260 series is equipped with internal temperature sensor on the primary power train. Failure to stay within the convection power rating will result in the power supply reducing the available current (fold back) below the programmed amount. The main output current will be restored to the programmed value when the temperature of the built-in temperature sensor cools adequately.

### Output Open Load

When the LED load is removed, the output voltage of the PDB260 series is typically limited to 1.3 times the maximum output voltage of each model.

### Over Power Protection

The LED driver will shut down and auto recover when its input power exceeds approximately 110% of 260W. This condition will cause no damage to the LED driver.

## 8 - OUTPUT POWER DE-RATING AT ELEVATED TEMPERATURES

The PDB260 series can be operated with cooling air temperatures above 50°C by linearly de-rating the total maximum output power (or current) by 2.5%/°C from 50°C to 70°C (see figure 2).

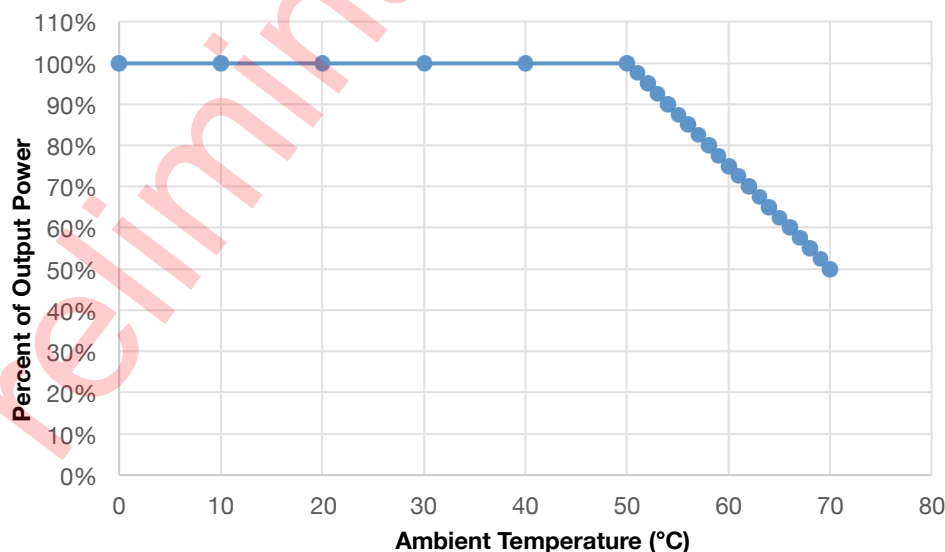


Figure 2

## Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

### 9 - 0-10 V DIMMING

The PDB260 series operate only with 0-10V dimmers that sink current. They are not designed to operate with 0-10V control systems that source current, as used in theatrical/entertainment systems. Developed in the 1980's, the 0-10V sinking current control method is adopted by the International Electrotechnical Commission (IEC) as part of its IEC Standard 60929 Annex E.

The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim Signal pins respond to a 0 to 10 V signal, delivering 1% to 100% of the output current based on rated current for each model. A pull-up resistor is included internal to the driver. When the +Dim wire (purple) is short circuited to the -Dim wire (grey) or to the -LED wire (blue), the output current turns off and the driver enters standby mode.

If the +Dim input is > 10 V or open circuited, the output current is programmed to 100% of the rated current.

When not used, the -Dim wire (grey) and to the +Dim wire (purple) can be individually capped or cut off. In this configuration, no dimming is possible and the driver delivers 100% of its rated output current.

The maximum source current (flowing from the driver to the 0-10V dimmer) supplied by the +Dim Signal pin is  $\leq 1$  mA. The tolerance of the output current while being dimmed shall be  $\pm 8\%$  typical until down to 1.5 V.

The non-linear 0-10V dimming profile is the default profile across all models of the PDB series. In the non-linear 0-10V dimming profile, shown in figure 3, 10V to 9.1V=100% of the output current, 1.5V to 0.6V=1%, <0.6V=dim-to-off).

The non-linear curve is recommended when using standard in wall 0-10 V logarithmic dimmers to avoid having insufficient source current available to pull the dimmer up to 10V and to account for the inability of the dimmer to pull below approximately 0.9V. In these type of installations, the modified transfer function will ensure 100% light output and dimming to 1%, regardless of the number of drivers on the 0-10V dimming line. Please contact your sales representative or send an email to: [SaveEnergy@erp-power.com](mailto:SaveEnergy@erp-power.com) for additional information.

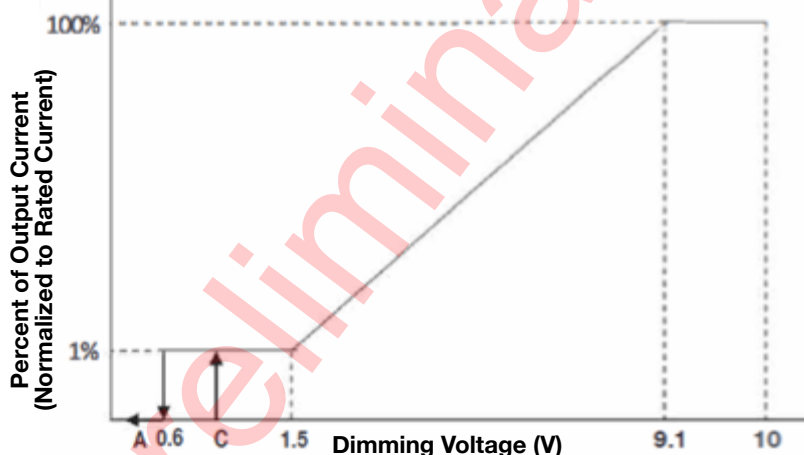


Figure 3

Dimming Voltage	Description	Value
A	in standby	< 600 mV
C	out of standby, hysteresis	> 700 mV, < 800 mV

### 10 - COMPATIBLE 0-10 V DIMMERS

- Lutron, Nova series (part number NFTV)
- Lutron, Diva series (part number DVTV)
- Leviton, IllumaTech series (part number IP710-DL)



## Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

### 11 - PROGRAMMING

The PDB260 series can be programmed by inserting the audio jack of the cable shown in figure 4 into the driver and by plugging the USB other end of the cable into a computer. **The driver does not need to be powered on during the programming process.** Programming is done by using the ERP GUI (Graphical User Interface) which enables to trim or adjust the following parameters:

- 1) Selection of output voltage range.
- 2) Output current from 100% to 50% in each voltage range.

For example, assuming you wish to program the PDB260-1700-210. If you select the voltage range of 160 to 210 V, the current can be programmed to any value between 620 and 1240 mA. Or if you select the output voltage range of 114 to 150 V, the output current can be programmed to any value between 850 and 1700 mA.

Furthermore, when connecting the driver to a computer using the programming cable, you can access the driver's internal data log and read the following information: SKU, serial number, manufacturing lot code, hours of operation, firmware revision, and fault events: power failure, transients (short or surge), thermal events (i.e. number of times the case temperature has exceed the maximum case temperature of 90°C)..

For more information, please refer to the GUI user's manual.



Figure 4

## Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

### 12 - MECHANICAL DETAILS

**Packaging Options:** Aluminum case

**I/O Connections:** Flying leads, 18 AWG on power leads, 22 AWG on 0-10V dimming wires and on auxiliary output, 203mm (8 in) long, 105°C rated, stranded, stripped by approximately 9.5mm, and tinned. All the wires, on both input and output, have a 600 V insulation rating.

**Ingress Protection:** IP66 rated

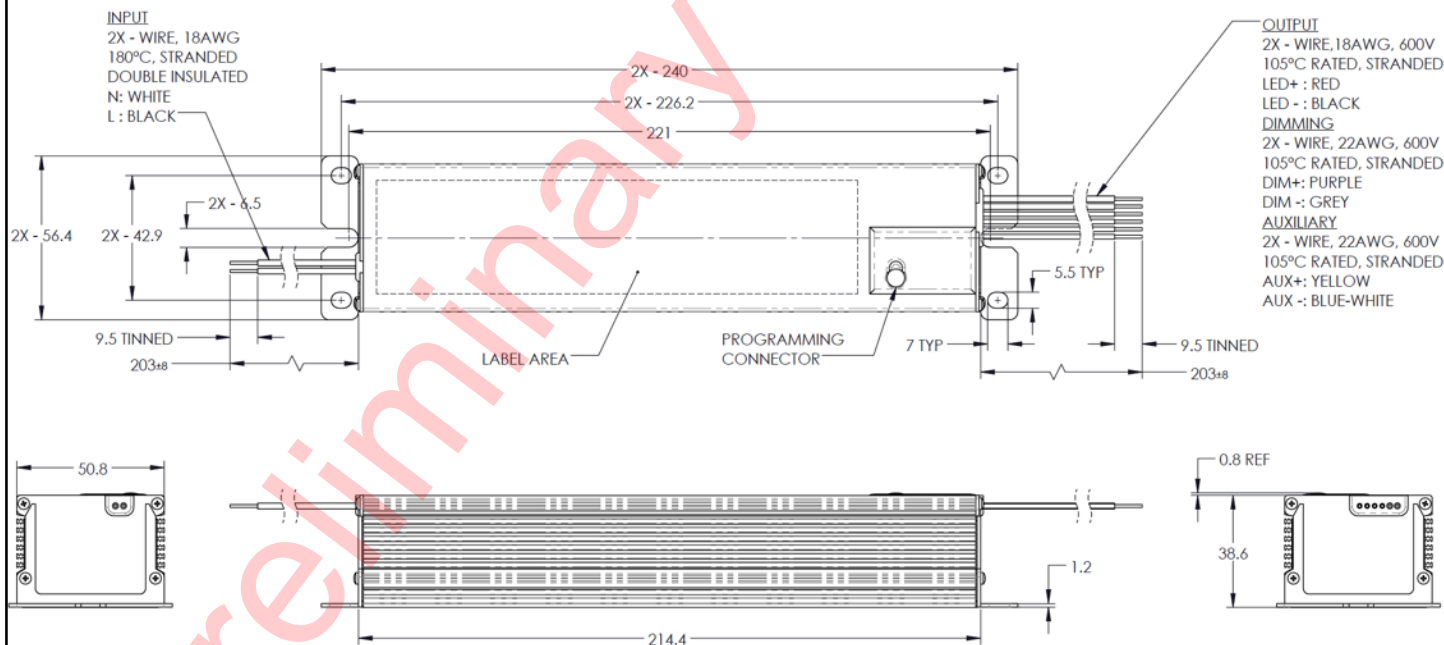
**Mounting Instructions:** The PDB260 driver case must be secured on a flat surface through the two mounting tabs, shown here below in the case outline drawings.

### 13 - OUTLINE DRAWINGS

**Dimensions:** L 214.4/240 x W 50.8 x H 38.6 mm (L 8.44/9.47 x W 2.00 x H 1.52 in)

**Volume:** 420.4 cm<sup>3</sup> (25.65 in<sup>3</sup>)

**Weight:**



All dimensions are in mm

**Figure 5**





# PDB260 Series

150 to 260 W

## Programmable, Efficient, Compact CC LED Drivers with 0-10 V Dimming

### 14 - LABELING

The PDB260-1700-210 is used in figure 6 as an example to illustrate a typical label.

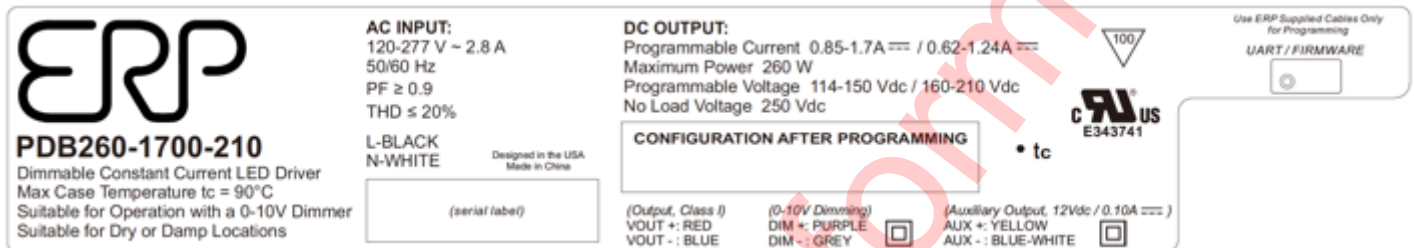


Figure 6

#### USA Headquarters

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Fax: +1-805-517-1411  
893 Patriot Drive, Suite E,  
Moorpark, CA 93021, USA

#### CHINA Operations

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No. 8 Pingdong Road 2  
Zhuhai, Guangdong, China 519060

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