POWER + LIGHT™

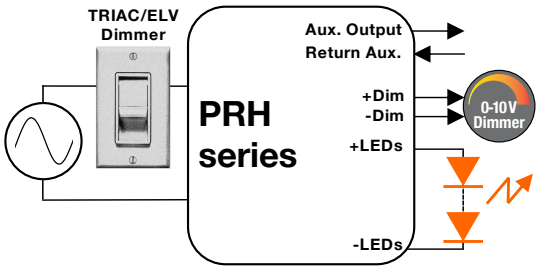
PRH Series

PRH-A05	10 W
PRH-A/B20	20 W
PRH-A/B30	30 W
PRH-A/B50	50 W

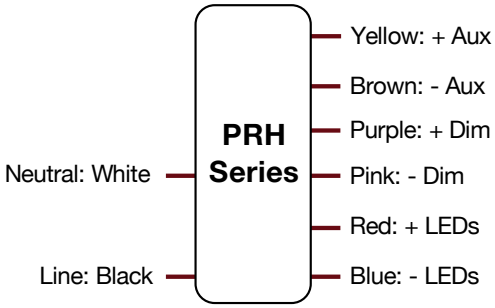
20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

Input Voltage (Vac)	Max. Output Power	Output Voltage (Vdc)	Output Current (mA)	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range	Startup Time
120 - 277	50 W	10 - 55	100 - 1400	up to 92% typical	Life : 85°C UL : 90°C	< 20% @ max load	> 0.9	Programmable Forward-Phase (at 120 Vac only), Reverse-Phase (at 120 Vac only) & 0 - 10V (at both 120 and 277 Vac) with Dim-to-Off	1 - 100%	300 ms typical

Side Leads
Metal Case:
L 84 * W 40 * H 19.25 mm
(L 3.30 * W 1.57 * H 0.76 in.)



Application Diagram



Wiring Diagram

FEATURES

- Same footprint as the popular ESS series, but with a lower height
- Meets IEEE 1789-2015 “no impact” recommended practices for flicker
- Programmable dim-to-off for compliance with ANSI C137.1
- Lifetime: 50,000 hours @ Tc = 80°C
- 90°C maximum case hot spot temperature
- UL8750 Class P, Class 2 power supply
- Synchronized start-up: 100 ms
- IP20-rated case
- Surge protection:
  - IEC61000-4-5: 2 kV line to line/2 kV line to earth
  - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- Complies with ENERGY STAR®, DLC (DesignLight Consortium®), and CA Title 24 technical requirements

PROGRAMMING

- Audio jack programming
- 0-10V dimming profiles: Linear, Non-linear, Logarithmic
- Data log read: SKU, S/N, lot code, hours of operation, FW rev., power cycles

APPLICATIONS

- Commercial & residential lighting
- Architectural lighting
- Indoor Lighting

CERTIFICATIONS

c UL us LISTED · FC · ENERGY STAR · CA Title 24 · RoHS · 5 Year Warranty · GaN TECHNOLOGY

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

1 - ORDERING INFORMATION

Part Number (METAL CASE)	Input Voltage (Vac)	Max Output Power (W)	Iout (mA)[1]	Default Programmed Current (mA)	Vout Min. (Vdc)	Vout Nom. (Vdc)	Vout Max. (Vdc)[2]	Open Loop (No Load) Voltage (Vdc)	Notes
Up to 10W									
PRH-A05W-02-55-SXZ	120 - 277	20	100 to 210	200	10	49.5	55	60	0-10V dimming only, Auxiliary output
Up to 20W									
PRH-A20W-07-55-SZ	120 - 277	20	100 to 700	350	10	49.5	55	60	0-10V dimming only
PRH-A20W-07-55-SXZ	120 - 277	20	100 to 700	350	10	49.5	55	60	0-10V dimming only, Auxiliary output
PRH-B20W-07-55-ST	120 - 277	20	100 to 700	350	10	49.5	55	60	Tri-mode™ dimming
PRH-B20W-07-55-SXT	120 - 277	20	100 to 700	350	10	49.5	55	60	Tri-mode™ dimming, Auxiliary output
21 to 30W									
PRH-A30W-10-55-SZ	120 - 277	30	275 to 1050	700	10	49.5	55	60	0-10V dimming only
PRH-A30W-10-55-SXZ	120 - 277	30	275 to 1050	700	10	49.5	55	60	0-10V dimming only, Auxiliary output
PRH-B30W-10-55-ST	120 - 277	30	275 to 1050	700	10	49.5	55	60	Tri-mode™ dimming
PRH-B30W-10-55-SXT	120 - 277	30	275 to 1050	700	10	49.5	55	60	Tri-mode™ dimming, Auxiliary output
31 to 50W									
PRH-A50W-14-55-SZ	120 - 277	50	500 to 1400	1050	10	49.5	55	60	0-10V dimming only
PRH-A50W-14-55-SXZ	120 - 277	50	500 to 1400	1050	10	49.5	55	60	0-10V dimming only, Auxiliary output
PRH-B50W-14-55-ST	120 - 277	50	500 to 1400	1050	10	49.5	55	60	Tri-mode™ dimming
PRH-B50W-14-55-SXT	120 - 277	50	500 to 1400	1050	10	49.5	55	60	Tri-mode™ dimming, Auxiliary output

NOTES:

(1) The ERP LED Driver Configuration Tool (ERP GUI) allows programming of the output current to values below the minimum limits specified in the table above. However, when the programmed output current is set below these minimum thresholds, the LED driver's Total Harmonic Distortion (THD) and Power Factor (PF) may not meet the values defined in the INPUT SPECIFICATION section of this datasheet. For proper operation, please also refer to the OPERATING ENVELOPE for each part number in section 2, which defines the permissible ranges of output current and output voltage where THD and PF compliance is maintained.

(2) The forward voltage (Vf) of the LED load should not exceed Vout Max. of the driver under worst case field operating conditions which are the Vf max. of the LED load under lowest temperature and highest forward current conditions. As a general design guideline, the nominal LED load Vf measured at the operating current and at room temperature should be ≤ Vout Nom. of the driver.

2 - ACCESSORIES

NOTES:

- *Please order the programming cable using part number **PROG-JACK-USB**.*
- *The optional programming cradle can be ordered using part number **PROG-PRH-CRADLE***

Programming Cradle

Part number: PROG-PRH-CRADLE

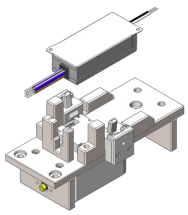


Figure 1

Programming Cable

Part number: PROG-JACK-USB

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

3 - OPERATING ENVELOPES

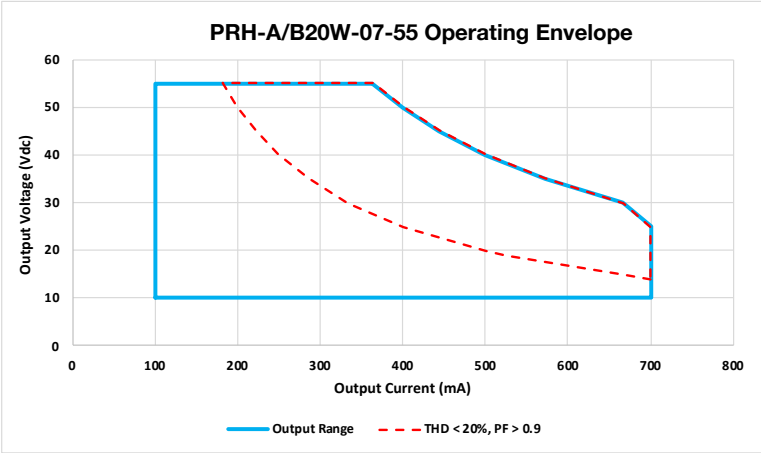


Figure 2

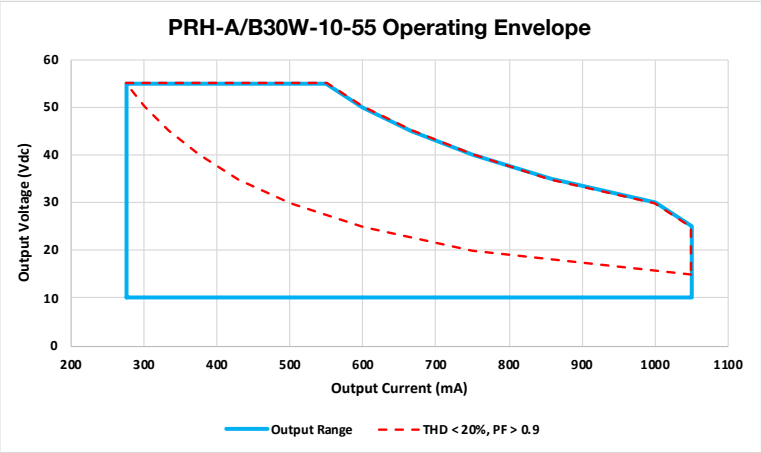


Figure 3

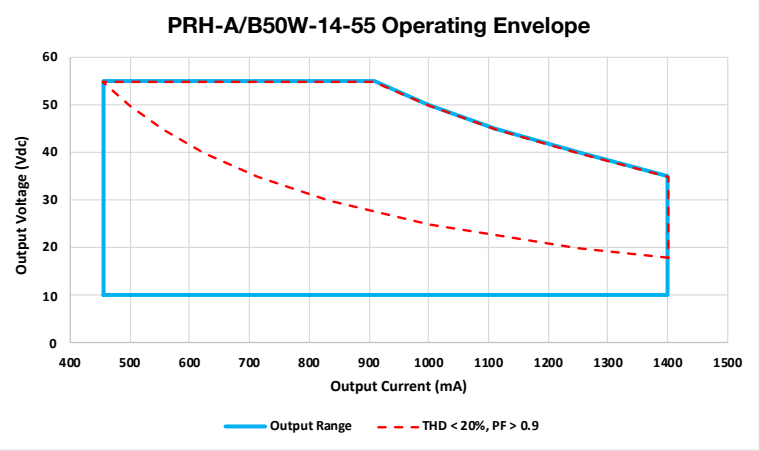


Figure 4

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

4 - INPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	108	120, 277	305	•The rated output current for each model is achieved at Vin≥108 Vac, and at Vin≥249 Vac. •At nominal load
Input Frequency Range	Hz	47	50/60	63	
Input Current (Iin)	A			0.5 A @ 120 Vac 0.25 A @ 277 Vac	
Power Factor (PF)		0.9	> 0.9		•At nominal input voltage (120 & 277 Vac) and no dimmer •From 100% to 60% of output power (from 100% to 70% for PRH-A20, PRH-B20, and PRH-A05 models)
Inrush Current	A	Meets NEMA-410 requirements			•At any point on the sine wave and 25°C
Leakage Current	mA			0.4 mA @ 120 Vac 0.75 mA @ 277 Vac	Measured per IEC60950-1
Total Harmonics Distortion (THD)				20%	•At nominal input voltage (120 & 277 Vac) •From 100% to 60% of output power from 100% to 70% for PRH-A20, PRH-B20, and PRH-A05 models) •Complies with DLC (Design Light Consortium) technical requirements
Efficiency	%	-	up to 92%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer attached.
Standby Power	W			0.5 1	•At 120 Vac •At 277 Vac
Isolation	The AC input to the main DC output is isolated.				

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

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

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc				•See ordering information for details
Output Current (Iout)	mA				•See ordering information for details •Output voltage and current combination cannot exceed max power output. See section 2 for operating window •The rated output current for each model is achieved at Vin≥108 Vac & Vin≥249 Vac.
Output Current Regulation	%	-5	±2	5	•At nominal AC line voltage (120 & 277 Vac) •Includes load and current set point variations
Output Current Overshoot	%	-	-	20	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	≤ 10% of max 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 •Compliant with IEEE1789-2015. Meets "No Impact" levels
Dimming Range	%	1		100	•The dimming range is dependent on each specific dimmer. It may not be able to achieve 1% dimming with some dimmers. •When testing, if light is measured, dimming range is based on light output. If no light is measured, dimming range is based on percentage of output current. •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		300	500	•Without any dimmer attached, and at nominal input voltages and nominal load •Synchronized start-up of 100 ms when multiple drivers on same circuit •Measured from application of AC line voltage to 100% light output •Complies with ENERGY STAR® luminaire specification and CA Title 24
Isolation	The main DC output is certified and tested per UL8750 Class 2.				

6 - AUXILIARY OUTPUT: "-SXZ" & "-SXT" MODELS ONLY (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Auxiliary Output Voltage	Vdc	9.5	12	24	•Default value is 12 V •+/-20% voltage regulation •Configurable through programming in 0.5 V increments
Auxiliary Output Power	W			1.2	

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

7 - DEFAULT 0-10 V DIMMING PROFILE (@25°C ambient temperature)

Using the ERP LED Driver Configuration Tool (ERP GUI), users can select from several 0–10V dimming profiles, including a logarithmic profile, an ANSI C137.1-compliant profile, and non-linear profiles with either 1% or 10% minimum dimming, each available with or without dim-to-off.

Dim-to-off can be enabled or disabled independently, and a fully user-defined dimming profile can also be created, allowing precise programming of every point along the dimming curve.

By default, the PRH series is pre-loaded with the non-linear profile featuring 1% minimum dimming with dim-to-off, as shown in Figure 5.

	Units	Minimum	Typical	Maximum	Notes
Default Dimming Profile (see figure 5)	100% of output current between 10 V and 8 V, Linear between 8 V and 1 V, 1% of output current below 1 V.				
Dimming Range	%	1		100	When testing, if light is measured, dimming range is based on light output. If no light is measured, dimming range is based on percentage of output current.
High Level Voltage - A	V		8.0		
Low Level Voltage - B	V		1.0		
Dim to Off - C	V		0.7		
Dim to On - D	V		0.9		
Current Supplied by the +Dim Signal Pin	mA			0.5	
Dimming Voltage Sensing Tolerance	mV			100	The tolerance of the difference between the 0-10 V signal supplied by the dimmer and sensed by the driver.
Output Current Tolerance While Being Dimmed	%		±8		In the linear region of the dimming curve (between points A and B in Figure 5).
Output Current Tolerance at Minimum Dimming	%	0.5		2	The tolerance of the output current at minimum dimming varies from 0.5% of 2% of the programmed output current of each driver.
Isolation	The 0-10 V circuit is isolated from the AC input and meets UL8750 supplement SF requirements.				

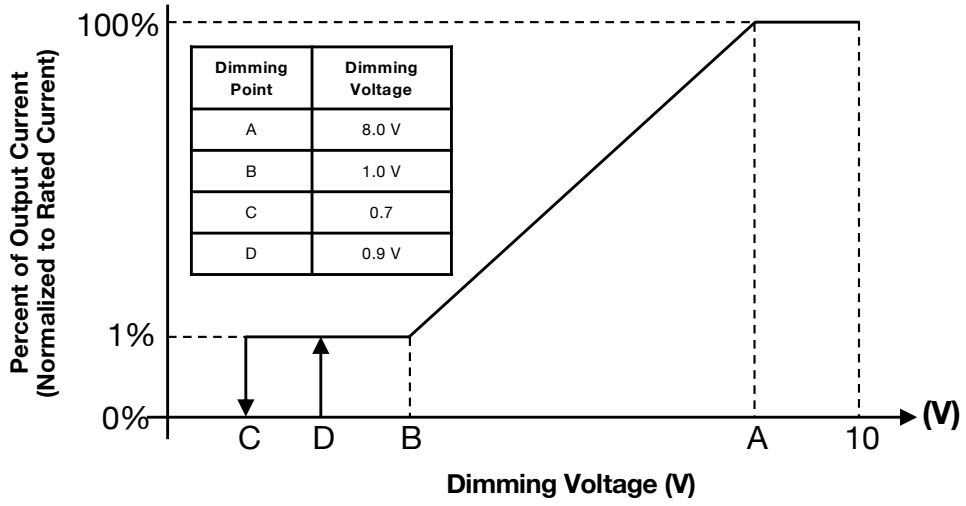


Figure 5

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

8 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
Operating Ambient Temperature (Ta)	°C	-20		50	50°C is the non-derated temperature (Refer to section 12 'Output power de-rating at elevated temperatures'.)
Maximum Case Temperature (Tc)	°C			+90	Case temperature measured at the hot spot •tc (see label on page 21)
Storage Temperature	°C	-40		+85	
Humidity	%	5	-	95	Non-condensing
Cooling	Convection cooled				
Acoustic Noise	dBA			24	Measured at a distance of 1 foot, with dimmer
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 ≤ 90°C				
Lifetime	50,000 hours @ Tc = 80°C with baseplate (200 mm x 80 mm x 2 mm)				
Warranty	5 years. Users must utilize proper thermal management techniques to ensure proper thermal conductivity between the driver and heat sink. The use of double-sided tape to mount the driver voids the warranty.				

9 - EMC COMPLIANCE, SAFETY, AND ENVIRONMENTAL APPROVALS

EMC Compliance			
Conducted and Radiated EMI	•Compliant with FCC CFR Title 47 Part 15 Class B at 120 & Class A 277 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	± 2 kV line to line (differential mode) /± 2 kV line to common mode ground
		ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave	
	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

Safety & Environmental Approvals	
UL	UL8750 Class P/Class 2 power supply
cUL	CAN/CSA C22.2 No. 250.13-14 LED equipment for lighting applications

Safety					
	Units	Minimum	Typical	Maximum	Notes
Hi Pot (High Potential) or Dielectric voltage-withstand	Vdc	2200			•Tested at the RMS voltage equivalent of 1555 Vac

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

10 - DIMMING FEATURES

Synchronized Start-up

The PRH series incorporates a synchronized start-up feature. When wired into the same dimmer, multiple PRH series drivers will dim to the same level and turn on within 100 ms of each other.

Fully Programmable Dimming Curve

In the PRH series, several 0-10V dimming profiles can be selected, such as a logarithmic profile, a non-linear profile with 1% minimum dimming, and a non-linear profile with 10% minimum dimming. Furthermore, every point in the non-linear dimming profile can be programmed using the programming software.

11 - PROTECTION FEATURES

Input Over Current Protection

The PRH series incorporates a primary AC line fuse for input over current protection to prevent damage to the LED driver and meet product safety requirements as outlined in Section 6.

Short Circuit and Over Current Protection

The PRH 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 PRH 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 Protection

When the LED load is removed, the output voltage of the PRH series is typically limited to 60 V, to meet Class 2 standard.

0-10 V Dimming Circuit Protection

The 0–10 V dimming circuit includes built-in protection against accidental mis-wiring, preventing damage even if AC line voltage is mistakenly connected to the dimming leads at any nominal input voltage.

12 - OUTPUT POWER DE-RATING AT ELEVATED TEMPERATURES

The PRH 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 until internal over temperature protection activates.

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

13 - COMPATIBLE PHASE-CUT DIMMERS

Lutron		Leviton		Cooper
TRIAC	ELV	TRIAC	ELV	TRIAC
S600P	DVELV303P	IPI06-1LZ	VPE06	AAL06A
SCL-153P	SELV300P	6161		DLA06P
DVCL153P	MAELV600	6673-IW		
DV600P	FAELV500			
TGCL153P				

***NOTE**: Dimming compatibility charts are available for each model on the PRH series page at: erp-power.com.*

14 - PHASE-CUT DIMMING

The PRH series offers Tri-Mode Dimming™ compatibility with both phase-cut (reverse-phase/trailing-edge or forward-phase/leading-edge) and 0-10V dimmers. Phase-cut and 0-10V dimming cannot be used at same time.

Phase-cut dimming of the driver is possible with standard TRIAC-based (forward-phase or leading-edge) dimmers or with ELV (reverse-phase/trailing-edge) dimmers that chop the AC voltage as shown in Figure 6.

During the rapid rise time of the AC voltage when the dimmer turns on, the driver does not generate any current and inrush current is controlled. During the on-time of the AC input, the driver regulates the output current based upon the conduction angle. The RMS value of the driver's output current is proportional to the on-time of the AC input voltage. When operating with an incandescent dimmer, the RMS output current varies depending upon the conduction angle and RMS value of the applied AC input voltage. Figure 7 shows the typical output current versus conduction angle at the nominal input voltage. Operation throughout this dimming range is monotonic and produces a smooth transition of light output in both directions of the dimming range.

Forward-phase (TRIAC) and reverse-phase (ELV) dimming work only at 120 Vac.

The typical minimum dimming angle for startup is 45 degrees.

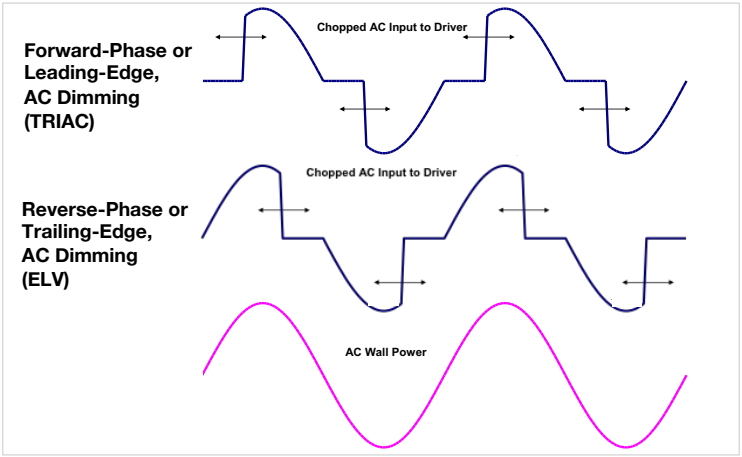


Figure 6

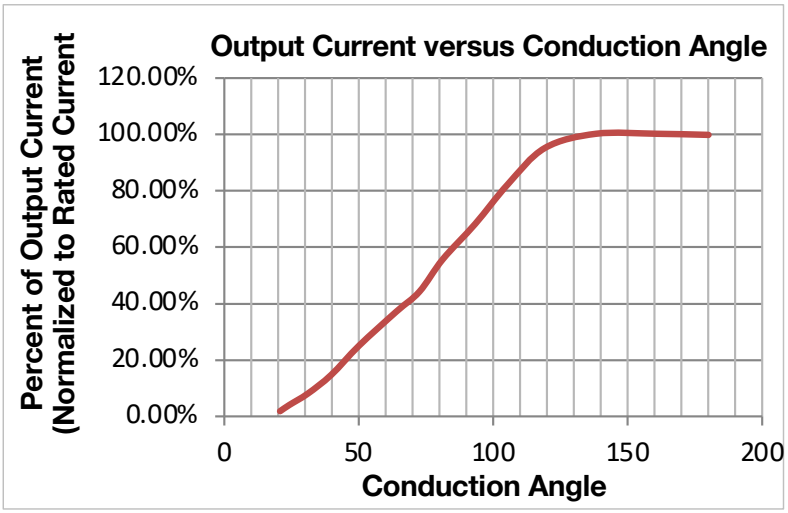


Figure 7

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

14 - PHASE-CUT DIMMING (CONTINUED)

The PRH series offers the ability to customize conduction angles for high performance TRIAC/ELV dimming through ERP's LED Driver Configuration Tool, downloadable through the ERP website (https://www.erp-power.com/erp-light-engines/led-light-programming-software/). While using the tool, users can select either the "ERP – Default" dimming profile (figure 8) which contains dimming parameters designed to work with a wide array of phase-cut dimmers, or users can use the tool to program custom conduction angles using the "Programmable – User-Defined" dimming profile (figure 9). Additionally, the custom conduction angle feature can enable or disable the use of dim-to-off conduction angles.

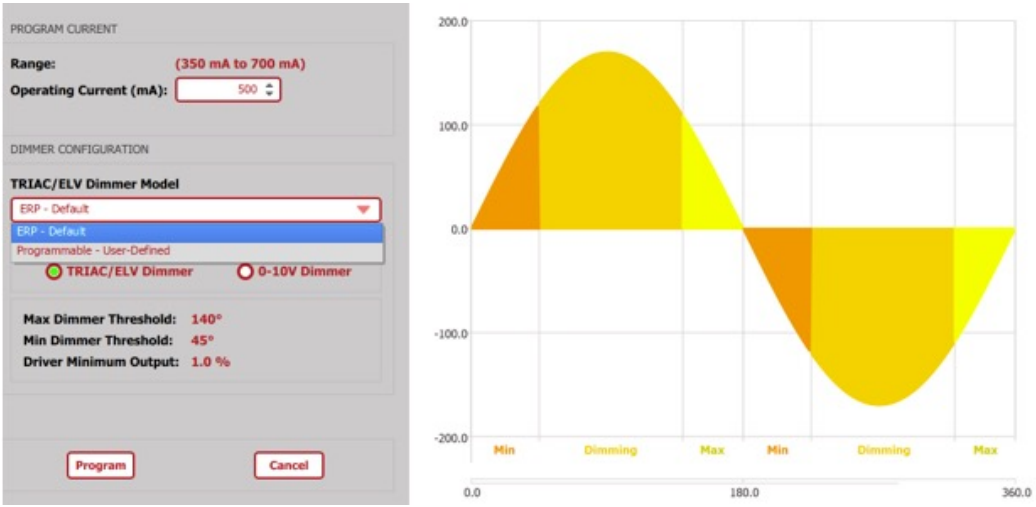


Figure 8

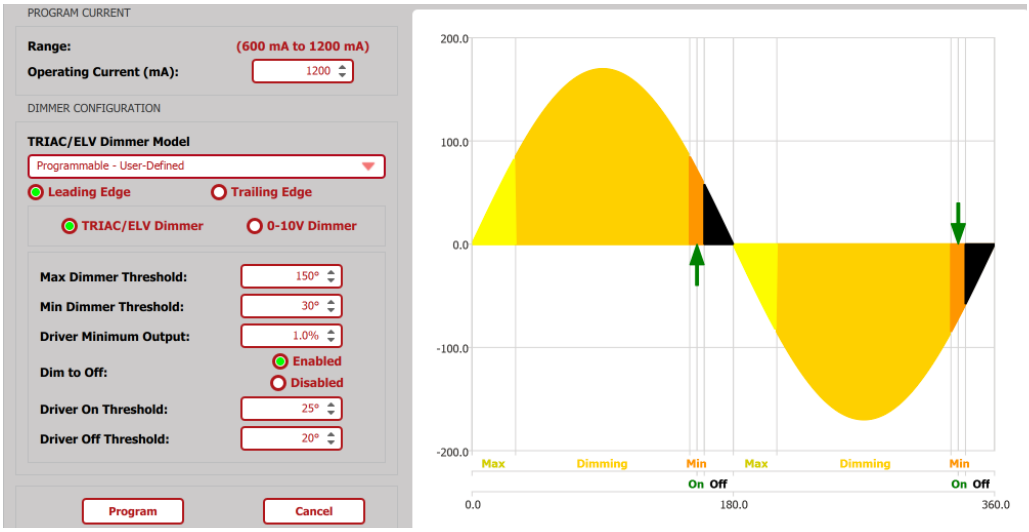


Figure 9

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

15 - 0-10 V DIMMING

The PRH series operate only with 0-10 V dimmers that sink current. They are not designed to operate with 0-10 V control systems that source current, as used in theatrical/entertainment systems. Developed in the 1980's, the 0-10 V 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. If the +Dim input is > 10 V or open circuited, the output current is programmed to 100% of the rated current.

The maximum source current (flowing from the driver to the 0-10 V dimmer) supplied by the +Dim Signal pin is ≤ 0.5 mA. The tolerance of the output current while being dimmed shall be +/-8% typical until down to 1 V.

Using the ERP LED Driver Configuration Tool (ERP GUI), users can select from several 0–10V dimming profiles, including a logarithmic profile, an ANSI C137.1-compliant profile, and non-linear profiles with either 1% or 10% minimum dimming, each available with or without dim-to-off.

Dim-to-off can be enabled or disabled independently, and a fully user-defined dimming profile can also be created, allowing precise programming of every point (A, B, C, D) along the dimming curve.

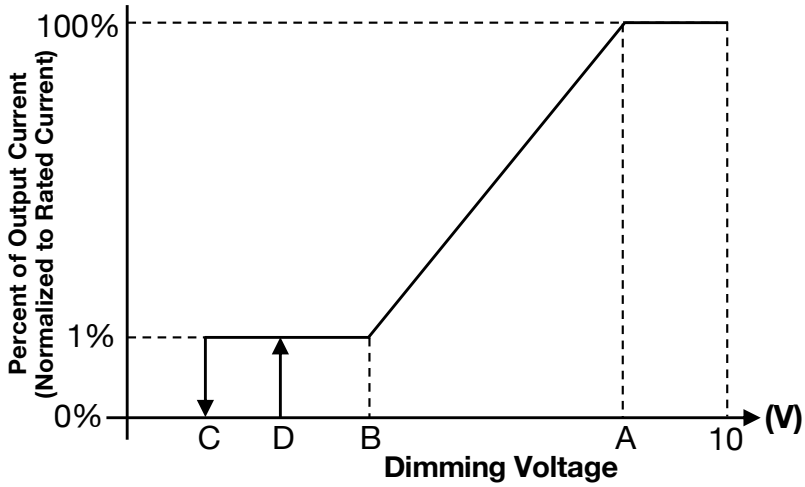


Figure 10

	Units	Minimum	Typical	Maximum	Tolerance	Notes
Dimming Range	%	1		100		When testing, if light is measured, dimming range is based on light output. If no light is measured, dimming range is based on percentage of output current.
High Level Voltage - A (Recommended Range)	V	7.0		9.0	±100 mV	Point A can actually be programmed to any value but it should never go below Point B.
Low Level Voltage - B (Recommended Range)	V	1.0		2.0	±100 mV	Point B can actually be programmed to any value but it should never go beyond Point A.
Dim to Off Range - C (Recommended Range)	V	0.5		1.0	±100 mV	
Dim to On Range - D (Recommended Range)	V	0.7		1.0	±100 mV	
Current Supplied by the +Dim Signal Pin	mA			0.5		
Dimming Voltage Sensing Tolerance	mV				100	The tolerance of the difference between the 0-10 V signal supplied by the dimmer and sensed by the driver.
Output Current Tolerance While Being Dimmed	%				±8	In the linear region of the dimming curve (between points A and B in Figure 10).
Output Current Tolerance at Minimum Dimming	%	0.5		2		The tolerance of the output current at minimum dimming varies from 0.5% to 2% of the programmed output current of each driver.

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

16 - COMPATIBLE 0-10 V DIMMERS

Lutron	Leviton
Nova series: NFTV	IllumaTech series: IP710-DL
Diva Series: DVTV	

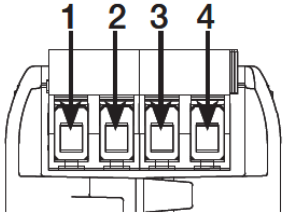
***NOTE**: Dimming compatibility charts are available for each model on the PRH series page at: erp-power.com.*

17 - CONNECTION AND COMPATIBILITY WITH EXTERNAL SENSORS

The PRH series is compatible with the Lutron Athena wireless node when programmed as an ANSI C137.1 0-10 V driver.

Athena RF Wireless Node

Athena Wireless Node Wiring Guide



Athena Connector Description	ERP LED Driver Wiring
1: AUX+	+Aux (Yellow)
2: AUX-	-Aux (Brown)
3: SIG+	+Dim (purple)
4: SIG-/DGND	-Dim (pink)

Connecting an Athena Wireless Sensor Node to an ERP LED Driver with Auxiliary Output (e.g. PLH, PRH, PLS series):

- Connect the AUX+ of Athena to the +Aux (yellow) wire of the ERP LED Driver
- Connect the AUX- of Athena to the -Aux (brown) wire of the ERP LED Driver
- Connect the SIG+ of Athena to the +Dim (purple) of the ERP LED Driver
- Connect the SIG- of Athena to the –Dim (pink) of the ERP LED Driver

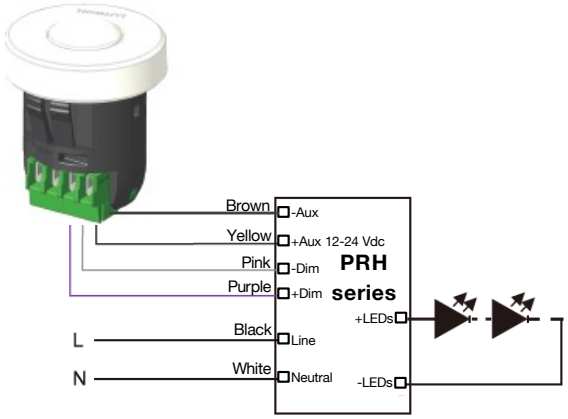


Figure 11

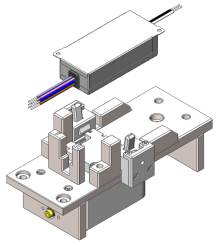
20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

18 - PROGRAMMING

The PRH series can be programmed by inserting the audio jack of the cable shown in figure 12 into the driver and by plugging the USB other end of the cable into a computer. The driver should not be powered on during the programming process.

When ordering the PRH series, please order a programming cable (**PROG-JACK-USB**). For high-volume programming applications, an optional programming cradle (**PROG-PRH-CRADLE**) is also available.

Programming Cradle
Part number: PROG-PRH-CRADLE



Programming Cable
Part number: PROG-JACK-USB

Figure 12

Programming is done by using the ERP LED Driver Configuration Tool (also known as ERP GUI), downloadable through the ERP website (https://www.erp-power.com/erp-light-engines/led-light-programming-software/), which enables the user to adjust output current and dimming profile.

Please note that, for each model, the **default output current setting is listed on page 2 of this datasheet**.

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 power cycles.

While programming drivers in a lot, the ERP GUI can interface with a label printer, which enables the user to add configuration labels to driver labels in order to highlight programmed output current. Listed below is the equipment needed to print labels.

Equipment	Part Number	Where to buy
Printer	TSC TC210	barcodefactory.com/tsc/printers/tc210/99-059a001-54lf
Ribbon	TSC Prem. Resin, 60mm x 110mm	barcodefactory.com/tsc/35-r060110-23cf
Labels	BAR-.81x.28-1-TT	barcodefactory.com/barcodefactory/labels/bar-_81x_28-1-tt

For more information, please refer to the ERP LED Driver Configuration Tool user's manual at: (https://www.erp-power.com/erp-light-engines/led-light-programming-software/).

IMPORTANT NOTE: During the first power-up, the PRH automatically executes an internal calibration and synchronization routine during which it interrogates the LED load. This routine ensures that when multiple PRH drivers are installed within a single luminaire, such as extended linear fixtures, or across adjacent luminaires, they all start up and shut down in a synchronized manner, thereby eliminating the "popcorning" effect that can occur during asynchronous driver start-up.

The calibration process typically completes within 5 to 10 seconds.
This process also occurs anytime the LED load (Vf) changes or the output current is re-programmed.

Each time the LED load (Vf) is changed, or the output current is re-programmed, the power-up cycle will exhibit a brief delay accompanied by an audible tone. This behavior is intentional and fully expected. The PRH series incorporates embedded intelligence designed to eliminate the popcorning effect.

Once this calibration is complete, all subsequent power-up events proceed normally with no delay or audible indication, provided that the LED load and output current remain unchanged.

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

19 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE

Lifetime is defined by the measurement of the temperatures of all the electrolytic capacitors whose failure would affect light output under the nominal LED load and worst-case AC line voltage. The graphs in figures 13, 14, 15, and 16 are determined by the electrolytic capacitor with the shortest lifetime, among all electrolytic capacitors. It represents a worst-case scenario in which the LED driver is powered 24 hours/day, 7 days/week. The lifetime of an electrolytic capacitor is measured when any of the following changes in performance are observed:

1) Capacitance changes more than 20% of initial value
2) Dissipation Factor (tan δ): 150% or less of initial specified value
3) Equivalent Series Resistance (ESR): 150% or less of initial specified value
4) Leakage current: less of initial specified value

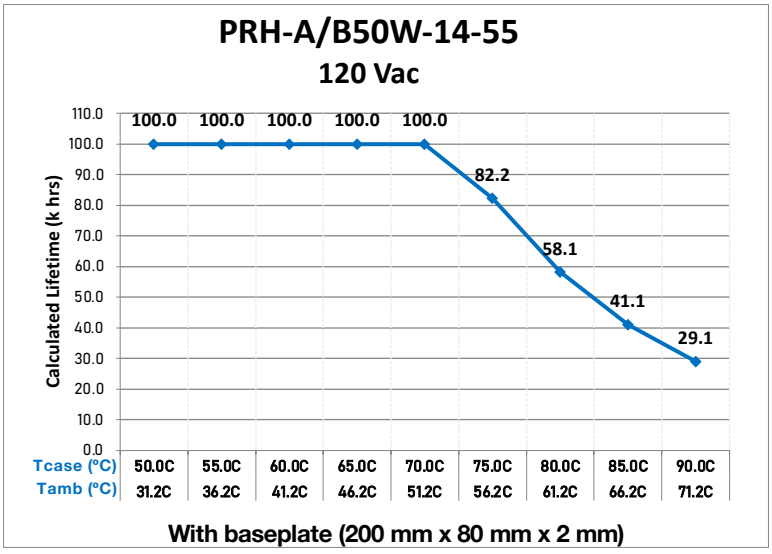


Figure 13

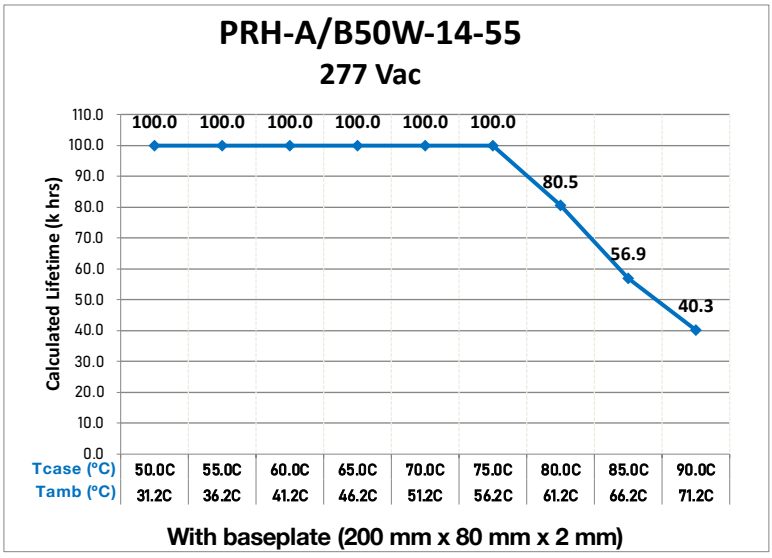


Figure 14

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

19 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE (CONTINUED)

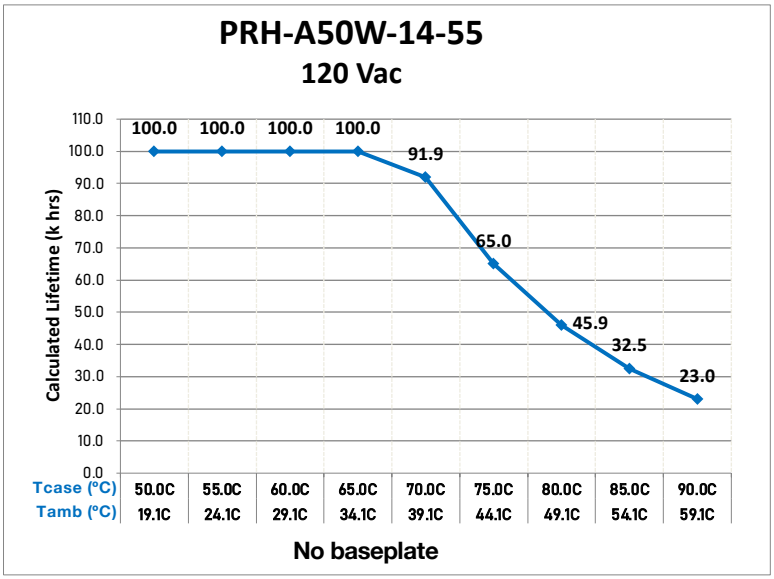


Figure 15

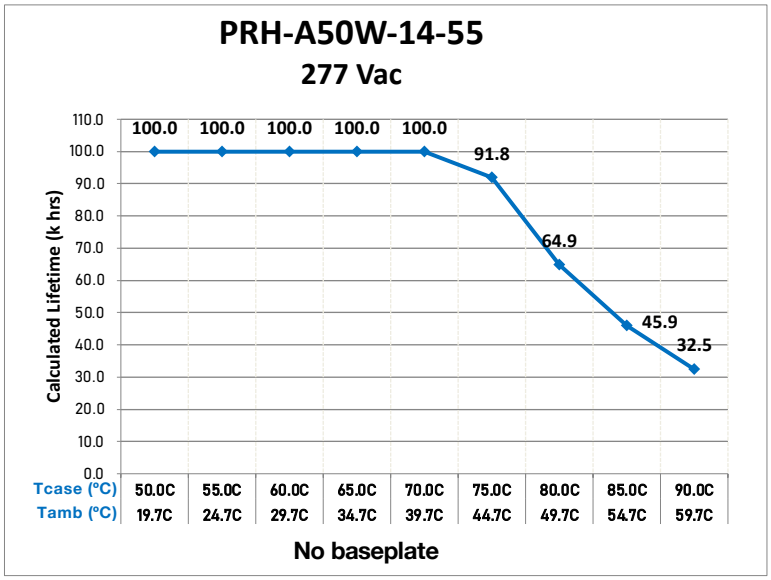


Figure 16

NOTES:

- *The ambient temperature ($T_{ambient}$) and the temperature differential between $T_{ambient}$ and T_{case} (case temperature) shown in the graphs above are only applicable when both the LED driver and the luminaire are operating within the same ambient environment. If the LED driver is enclosed or insulated, the ambient room temperature no longer represents the actual operating conditions. In such cases, the ambient temperature should be defined as the air temperature immediately surrounding the LED driver, and thermal performance should be evaluated based solely on the case temperature (T_{case}).*

- *It should be noted the graph "Lifetime vs. Ambient Temperature" may have an error induced in the final application if the mounting has restricted convection flow around the case. For applications where this is evident, the actual case temperature measured at the Tc point in the application should be used for reliability calculations.*

- *Users must utilize proper thermal management techniques to ensure proper thermal conductivity between the driver and heat sink. The use of double-sided tape, Velcro, etc… to mount the driver voids the warranty.*

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

20 – EFFICIENCY VERSUS OUTPUT VOLTAGE (100% OF OUTPUT CURRENT)

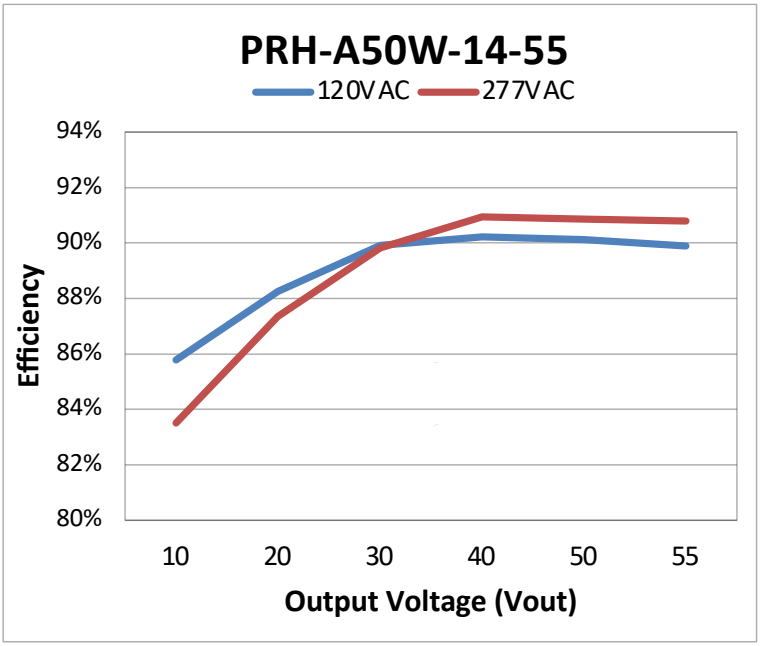


Figure 17

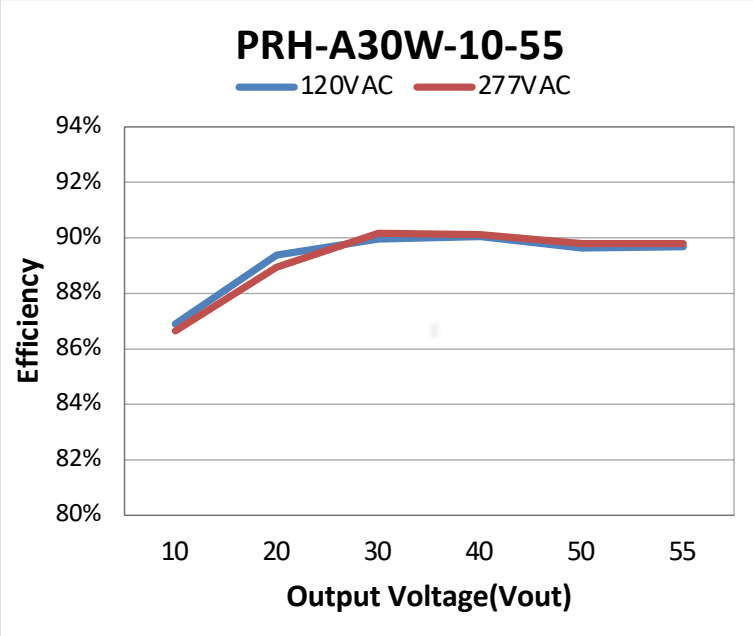


Figure 18

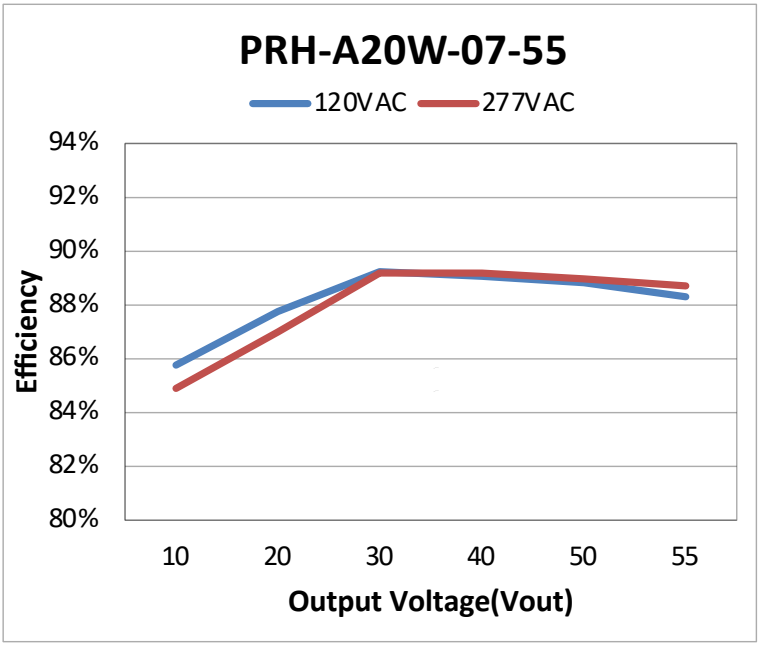


Figure 19

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

21 – POWER FACTOR VERSUS OUTPUT VOLTAGE (100% OF OUTPUT CURRENT)

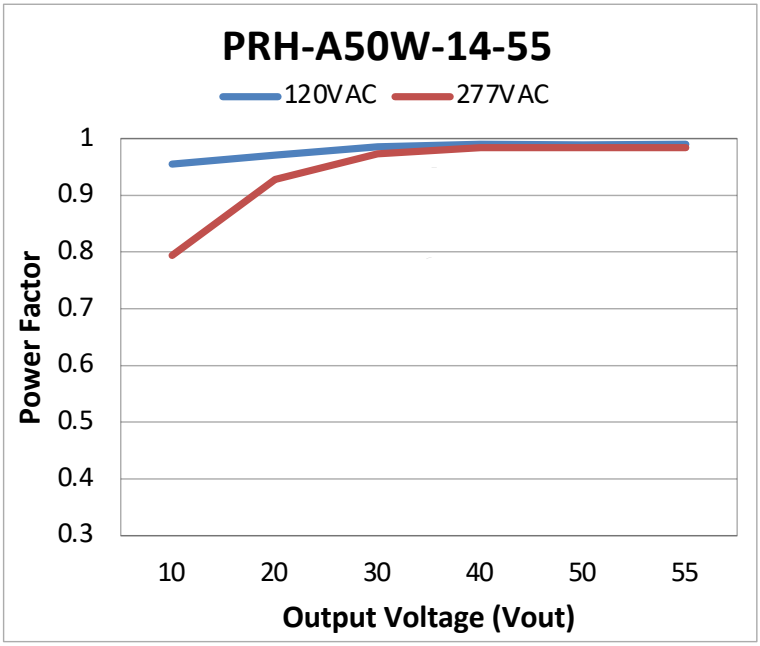


Figure 20

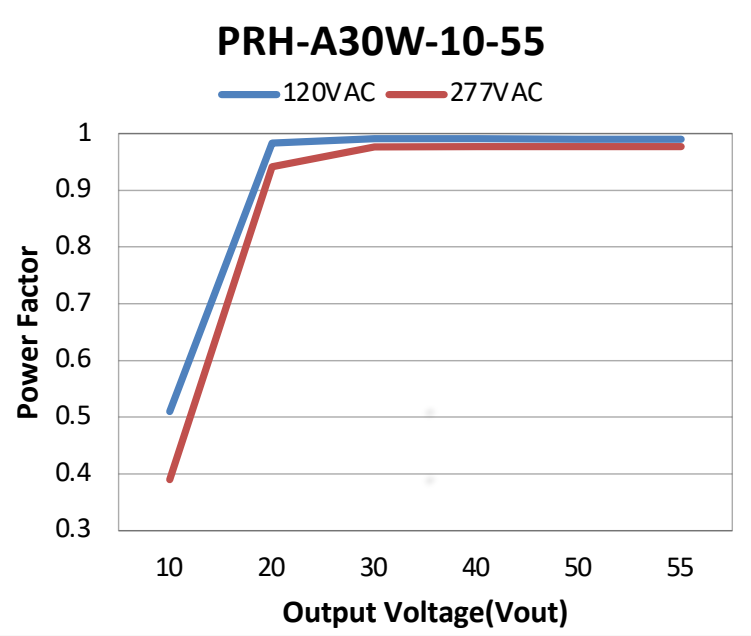


Figure 21

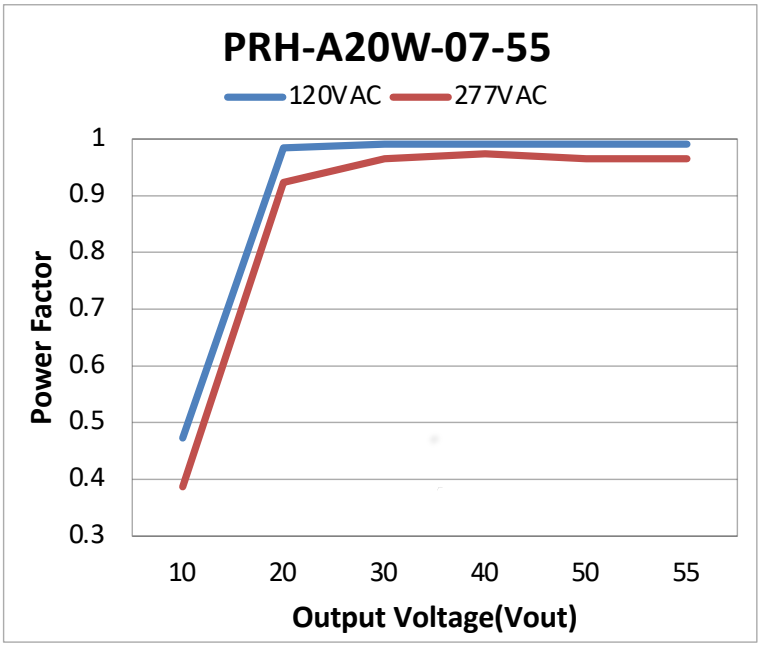


Figure 22

NOTE:
For proper operation, please also refer to the OPERATING ENVELOPE in section 3, which defines the permissible ranges of output current and output voltage where THD and PF compliance is maintained.

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

22 – THD VERSUS OUTPUT VOLTAGE (100% OF OUTPUT CURRENT)

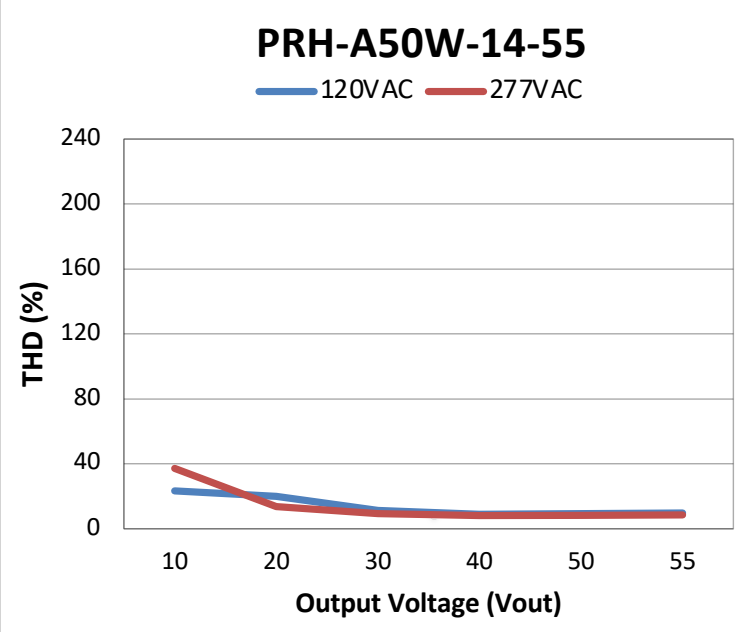


Figure 23

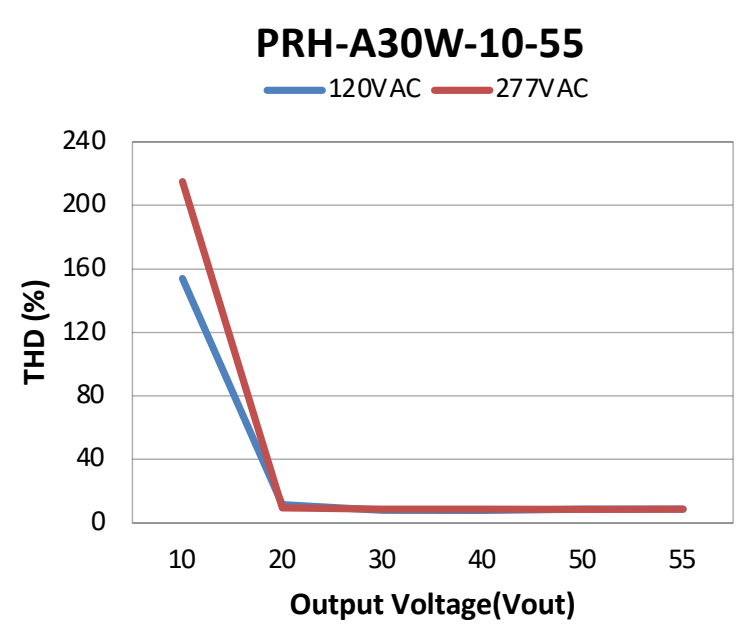


Figure 24

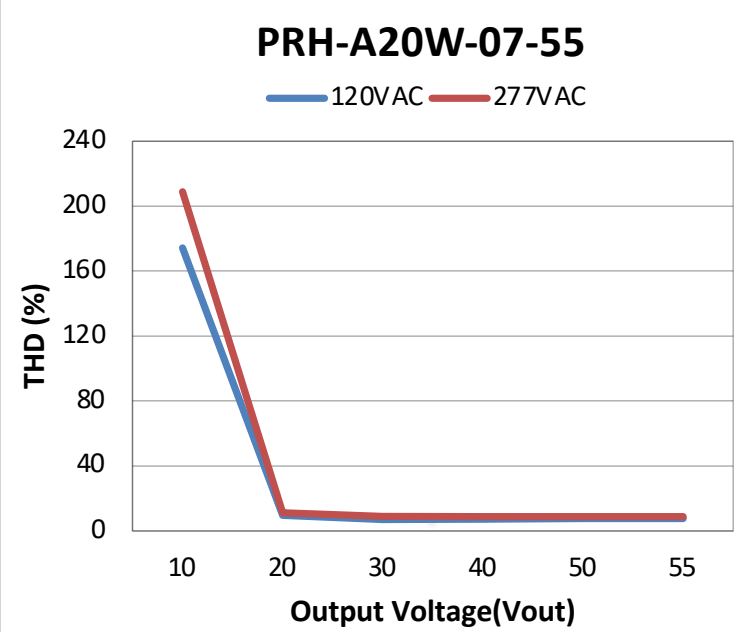


Figure 25

NOTE:
For proper operation, please also refer to the OPERATING ENVELOPE in section 3, which defines the permissible ranges of output current and output voltage where THD and PF compliance is maintained.

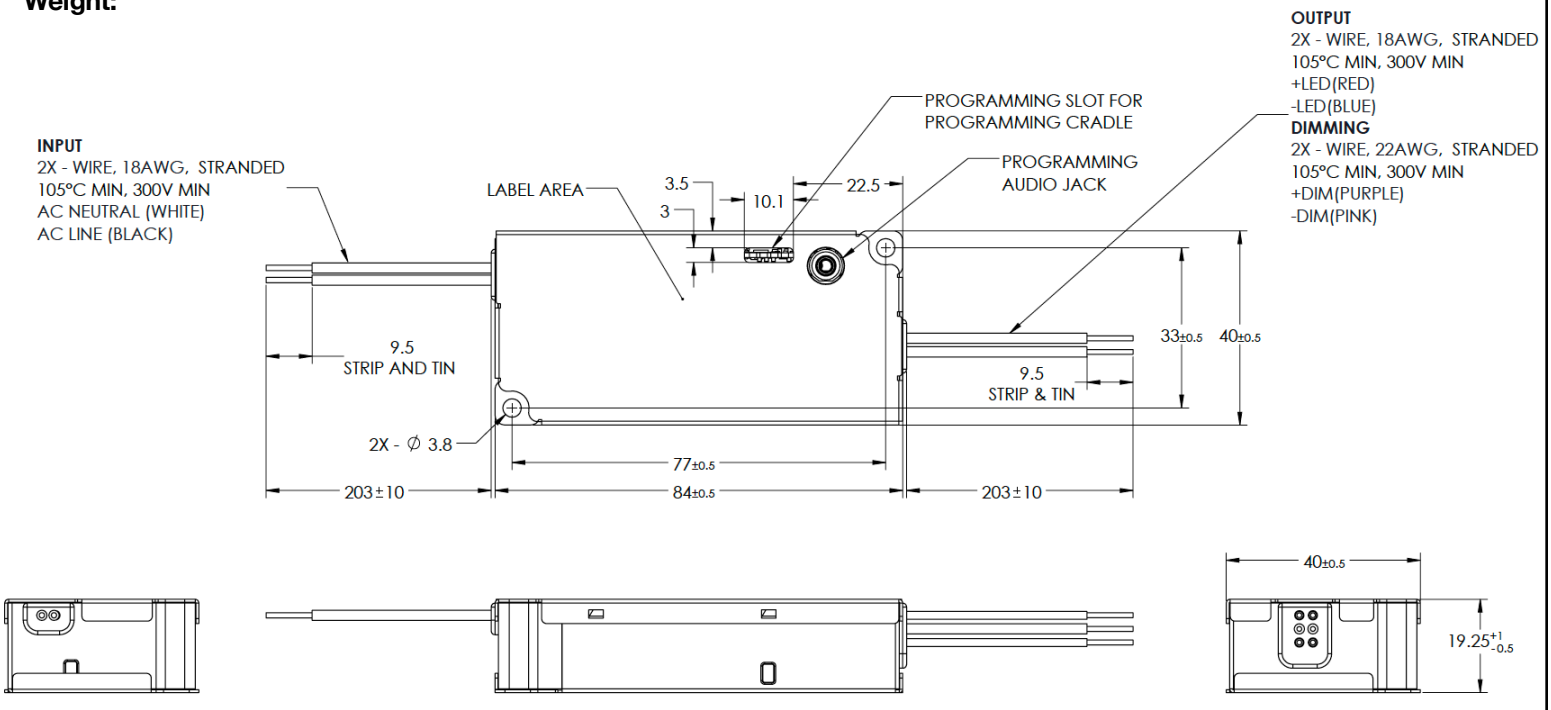
20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

23 - MECHANICAL DETAILS (-SZ and –ST MODELS, NO AUXILIARY OUTPUT)

- **Packaging:** Metal case
- **I/O Connections:** 18 AWG on all leads, 22 AWG on 0-10V dimming wires, 157 mm (6.18 in) long, 105°C rated, stranded, stripped by approximately 9.5 mm, and tinned. All the wires, on both input and output, have a 300 V insulation rating.
- **Ingress Protection:** IP20 rated
- **Mounting Instructions**: The PRH driver case must be secured on a flat surface through the two mounting clips shown here below in the case outline drawings. The use of double-sided tape voids the warranty.
  The screw mounting holes have a diameter of 3.8 mm, compatible with screw size #6 (UNC/UNF), M3 or M3.5 (ISO).
  THE CASE MUST BE GROUNDED.

24 - OUTLINE DRAWINGS (-SZ and –ST MODELS, NO AUXILIARY OUTPUT)

Dimensions: L 84 * W 40 * H 19.25 mm (L 3.30 * W 1.57 * H 0.76 in.)
Weight:



All dimensions are in mm

Figure 26

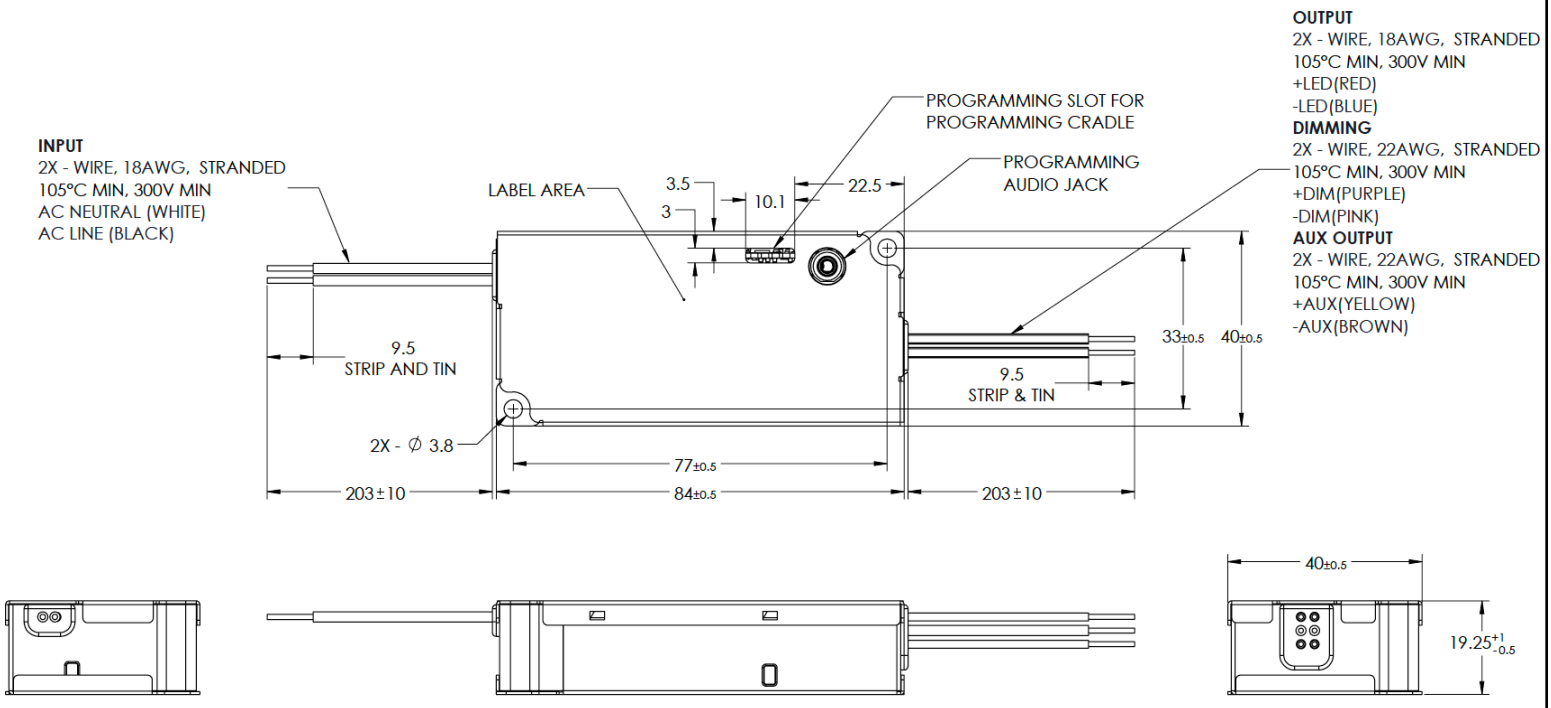
20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

25 - MECHANICAL DETAILS (-SXZ and –SXT MODELS, WITH AUXILIARY OUTPUT)

- **Packaging:** Metal case
- **I/O Connections:** 18 AWG on all leads, 22 AWG on 0-10V dimming wires, 157 mm (6.18 in) long, 105°C rated, stranded, stripped by approximately 9.5 mm, and tinned. All the wires, on both input and output, have a 300 V insulation rating.
- **Ingress Protection:** IP20 rated
- **Mounting Instructions**: The PRH driver case must be secured on a flat surface through the two mounting clips shown here below in the case outline drawings. The use of double-sided tape voids the warranty.
  The screw mounting holes have a diameter of 3.8 mm, compatible with screw size #6 (UNC/UNF), M3 or M3.5 (ISO).
  THE CASE MUST BE GROUNDED.

26 - OUTLINE DRAWINGS (-SXZ and –SXT MODELS, WITH AUXILIARY OUTPUT)

Dimensions: L 84 * W 40 * H 19.25 mm (L 3.30 * W 1.57 * H 0.76 in.)
Weight:



All dimensions are in mm

Figure 27

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

27 - LABELING

The PRH-A20W-07-55-SXZ is used in figure 28 as an example to illustrate a typical label.

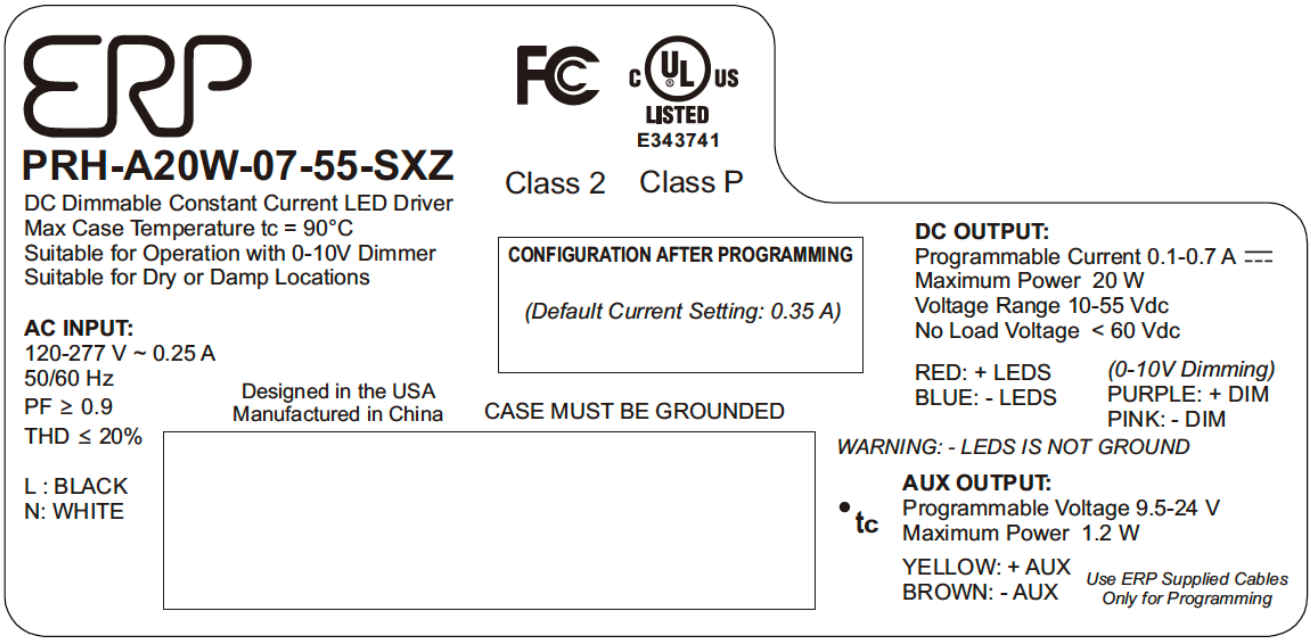


Figure 28

USA Headquarters
Tel: +1-805-517-1300
Fax: +1-805-517-1411
2625 Townsgate Road, Suite 106
Westlake Village, CA 91361, USA

CHINA Operations
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Zhuhai, Guangdong, China 519060

20 to 50 W High Density CC Programmable Class 2 LED Driver with 0-10V and Tri-Mode™ Dimming (TRIAC, ELV, & 0-10 V), and with Optional Auxiliary Output

Revision History

Date	Comments
06APR2026	• Final Release
28APR2026	• Updated the Output Current Tolerance at Minimum Dimming • Updated Efficiency, THD and Power Factor Curves • Updated lifetime graphs
04MAY2026	• Added information about the PRH programming cradle PROG-PRH-CRADLE