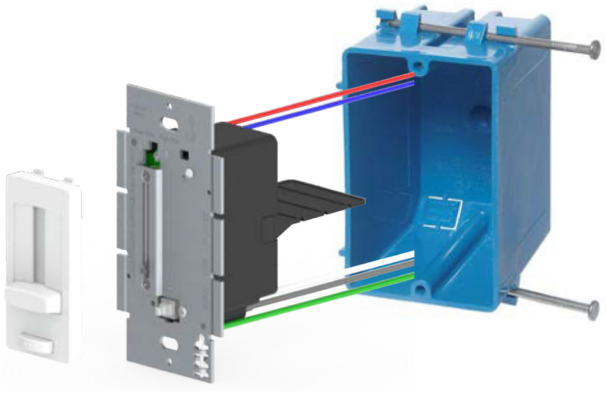
xDrive™ 100 W

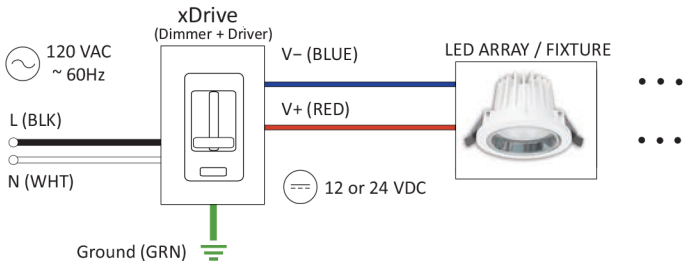
100 W Constant Voltage LED Driver with Integrated Dimmer for Single Gang Box Mount

Nominal Input Voltage	Max. Output Power	Output Voltage	Output Current Max	Efficiency	Max. Ambient Temperature	THD	Power Factor	Dimming Range	Startup Time
120 Vac	100 W	24 V CV	4.2 A	up to 91% typical	40°C	< 20%	> 0.9	1 - 100% of light output	500 ms typical

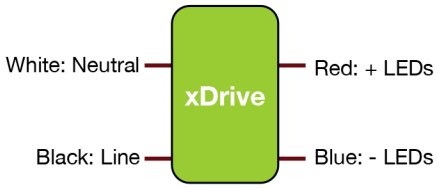
CV: Constant Voltage



100 W: Metal Case & metal wall plate



Typical Application Diagram



Wiring Diagram

FEATURES

- LED Driver + Dimmer in one physical unit
- Simplifies LED installation by eliminating compatibility issues between driver and dimmer
- Fits in a standard recessed electrical box (gang box)
- 100% - 1% smooth dimming
- Single pole preset dimmer with on/off push switch
- Adjustable voltage output dial to address voltage drop
- Includes voltage barrier partition to install high and low voltage circuit in same gang box
- No derating required when ganging units
- Power failure memory: If power is interrupted, xDrive will return to the setting prior to interruption.
- The Glossy White color is the default color for the face plate and the trim plate. Other colors (Glossy Light Almond, Glossy Dark Brown, and Glossy Black) are available but sold separately.
- Compatible with some 3rd party screw-less trim plates.

APPLICATIONS

- Track lights, downlights
- Tape/strip lights, and under-cabinet lights

c UL us LISTED E472619

FC

5 Year Warranty - 5 Year Warranty

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1 – ORDERING INFORMATION

Part Number	Nominal AC Line Voltage (Vac)	Pout Max (W)	Pout Min (W)	Vout Nom (V)	Iout Max (A)	Vout Regulation (Vdc)	Vout ripple (p-p)
AL-97-02-24100	120	100	5	24	4.2	22.2 - 25.8 (+/- 1.8 V)	< 10%
AL-97-02-24100-ALM	120	100	5	24	4.2	22.2 - 25.8 (+/- 1.8 V)	< 10%
AL-97-02-24100-BLK	120	100	5	24	4.2	22.2 - 25.8 (+/- 1.8 V)	< 10%
AL-97-02-24100-BRN	120	100	5	24	4.2	22.2 - 25.8 (+/- 1.8 V)	< 10%
AL-97-02-24100-WH	120	100	5	24	4.2	22.2 - 25.8 (+/- 1.8 V)	< 10%

Content of the box:
Each SKU model includes following accessories:

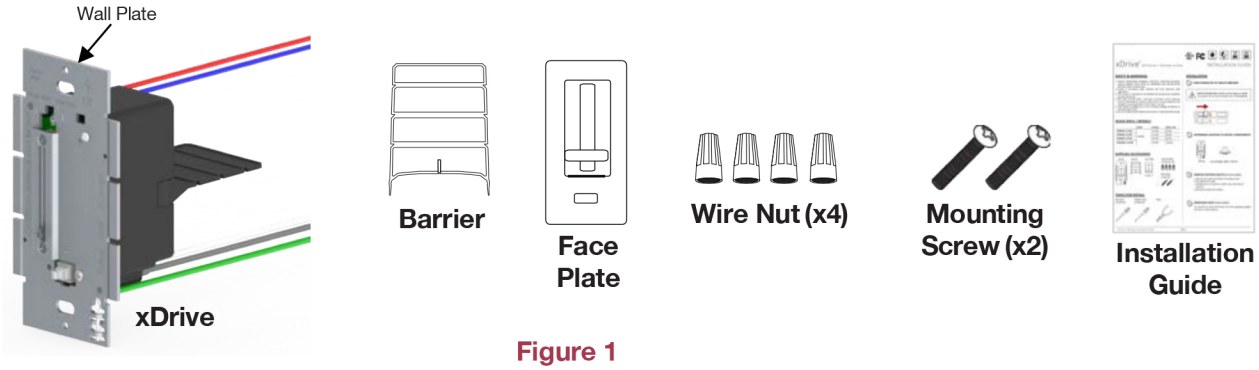


Figure 1

Notes:
1. The glossy white trim plate is not included in the box. It can be ordered as an option (part number: xDriveGWTP).
2. The Glossy White color is the default color for the face plate.
   Other colors (Glossy Light Almond, Glossy Dark Brown, and Glossy Black) are available but sold separately.
   Face plates can be interchanged as shown here below:

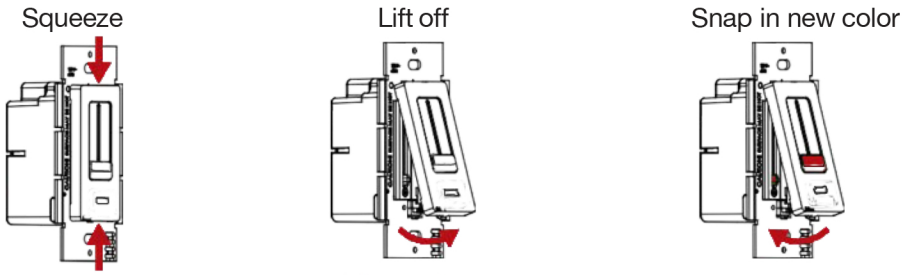
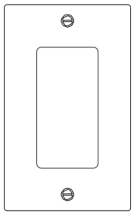


Figure 2

Optional Orderable Items:
- Glossy Brown Face Plate (FP) +Trim Plate (TP) part number: AL-97-02-24100-BRFPTP
- Glossy Light Almond FP+TP: AL-97-02-24100-ALMFPTP
- Glossy Black FP+TP: AL-97-02-24100-BLFPTP
- Glossy White TP: AL-97-02-24100-WHTP



Trim Plate

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

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	108	120	132	
Input Frequency Range	Hz	47	60	63	
Power Factor (PF)		0.9	> 0.9		At nominal input voltage and full rated load
Inrush Current	Meets NEMA-410 requirements				At any nominal input full sine wave voltage and full rated load
Leakage Current	µA			500	At nominal input voltage and measured per IEC 60950-1, paragraph 5.1
Input Harmonics	Complies with IEC61000-3-2 for Class C				
Total Harmonics Distortion (THD)				20%	•At nominal input voltage and full rated load •Complies with DLC (DesignLight Consortium) technical requirements
Efficiency	%	-	up to 91%	-	At nominal input voltage and full rated load
Isolation	Meets UL60950-1 for class II reinforced/double insulation power supply ⧈				
Standby Power	W	-		0.5	With no load

3 - OUTPUT SPECIFICATION (@25° C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc		24		See ordering information for details
Output Current (Iout)	A	0		4.2 A	•for 100 W/24 V
Output Voltage Regulation	%		±3.0		Includes AC line voltage, load, and voltage set point variations
Output Voltage Overshoot	%	-	-	20	The driver does not operate outside of the regulation requirements for more than 200 ms during power on
Ripple Voltage	≤ 10% of rated output voltage for each model				•Measured at nominal input voltage. •Calculated in accordance with the IES Lighting Handbook, 9th edition.
Dimming Range	%	1		100	As a % of light output
Start-up Time	ms		500		

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4 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
Operating Ambient Temperature (Ta)	°C	0		+40	
Storage Temperature	°C	-40		+85	
Humidity	%	8	-	90	Non-condensing
Cooling	Convection cooled				
Acoustic Noise	dBA			22	Measured at a distance of 1 foot (30 cm)
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 voltage and 75% of rated load, and at Tc ≤ 70°C				
Lifetime	hours	50,000			At Tc ≤70°C maximum case hot spot temperature

5 - EMC COMPLIANCE AND SAFETY APPROVALS

EMC Compliance			
Conducted and Radiated EMI		FCC CFR Title 47 Part 15 Class B at 120 Vac	
Harmonic Current Emissions		IEC61000-3-2	For Class C equipment
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	± 1 kV line to line (differential mode) /± 2 kV line to common mode ground (tested to secondary ground) on AC power port, ±0.5 kV for outdoor cables
	Conducted RF Disturbances	IEC61000-4-6	3 V, 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 Listed	UL8750, UL2108, UL1598 / CSA 250.0-08
cUL	CSA 250.13-12

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 1768 Vac

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6 - PROTECTION FEATURES

Under-Voltage (Brownout)
The xDrive series provides protection circuitry such that an application of an input voltage below the minimum stated in paragraph 1 (Input Specification) shall not cause damage to the driver.

Short Circuit
The xDrive 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 xDrive series incorporates circuitry that prevents internal damage due to an over temperature condition. An over temperature condition may be a result of an excessive ambient temperature or as a result of an internal failure. When the over temperature condition is removed, the driver shall automatically recover.

Output Over-Voltage Protection
The output voltage of the xDrive series is limited to 1.3 times the maximum output voltage of each model.

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7 – MOUNTING

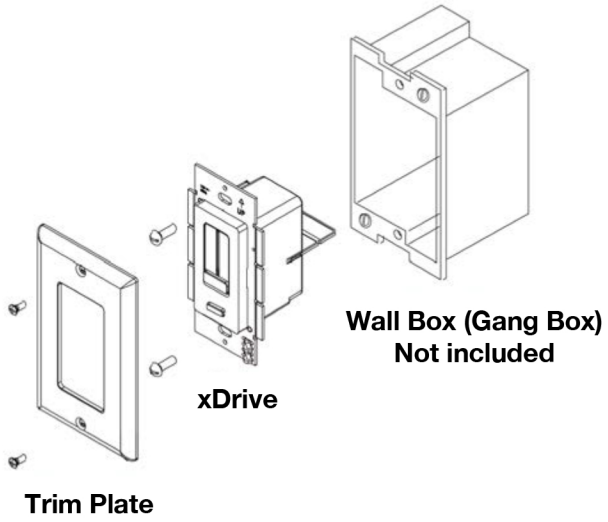
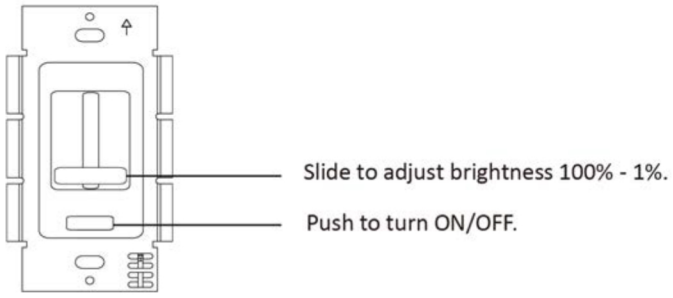


Figure 3

8 – OPERATION & DIMMING

Output voltage is adjustable via a sliding lever by end user.



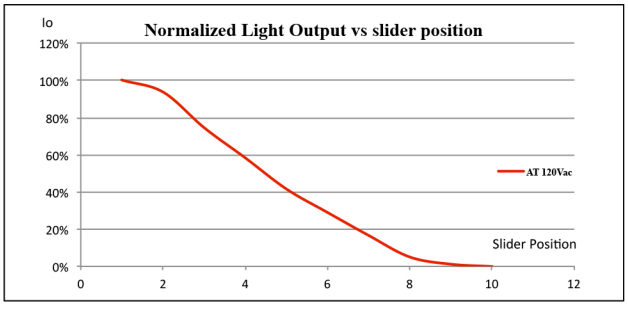


Figure 4

100 W Constant Voltage LED Driver with Integrated Dimmer for Single Gang Box Mount

9 – VOLTAGE DROP CHARTS

For best performance and lumen output, ensure proper wire gauge is installed to compensate for voltage drop of low voltage circuits.

Example: 12V Voltage Drop & Wire Length Distance Chart

Wire Gauge	10W .83A	20W 1.7A	30W 2.5A	40W 3.3A	50W 2.1A	60W 4.2A
18AWG	34ft.	17ft.	11ft.	8ft.	6ft.	5ft.
16AWG	54ft.	27ft.	18ft.	13ft.	10ft.	9ft.
14AWG	86ft.	43ft.	29ft.	21ft.	17ft.	14ft.
12 AWG	134ft.	68ft.	45ft.	34ft.	27ft.	22ft.
10AWG	199ft.	99ft.	66ft.	49ft.	39ft.	33ft.

1. Determine load size. Let's assume load is 55 W. Round up to the nearest load.
2. Determine distance from xDrive to load. Let's assume the distance is 20 ft. Round up to the nearest distance.
3. It is then recommended to install 12 AWG to eliminate excess voltage drop.

12V Voltage Drop & Wire Length Distance Chart

Wire Gauge	10W .83A	20W 1.7A	30W 2.5A	40W 3.3A	50W 2.1A	60W 4.2A
18AWG	34ft.	17ft.	11ft.	8ft.	6ft.	5ft.
16AWG	54ft.	27ft.	18ft.	13ft.	10ft.	9ft.
14AWG	86ft.	43ft.	29ft.	21ft.	17ft.	14ft.
12AWG	134ft.	68ft.	45ft.	34ft.	27ft.	22ft.
10AWG	199ft.	99ft.	66ft.	49ft.	39ft.	33ft.

24V Voltage Drop & Wire Length Distance Chart

Wire Gauge	10W .42A	20W .83A	30W 1.3A	40W 1.7A	50W 2.1A	60W 2.5A	70W 2.9A	80W 3.3A	100W 4. 2A
18AWG	134ft.	68ft.	45ft.	33ft.	27ft.	22ft.	19ft.	17ft.	14ft.
16AWG	215ft.	109ft.	72ft.	54ft.	43ft.	36ft.	31ft.	27ft.	22ft.
14AWG	345ft.	174ft.	115ft.	86ft.	69ft.	57ft.	49ft.	43ft.	36ft.
12AWG	539ft.	272ft.	181ft.	135ft.	108ft.	90ft.	77ft.	68ft.	56ft.
10AWG	784ft.	397ft.	263ft.	197ft.	158ft.	131ft.	112ft.	98ft.	82ft.

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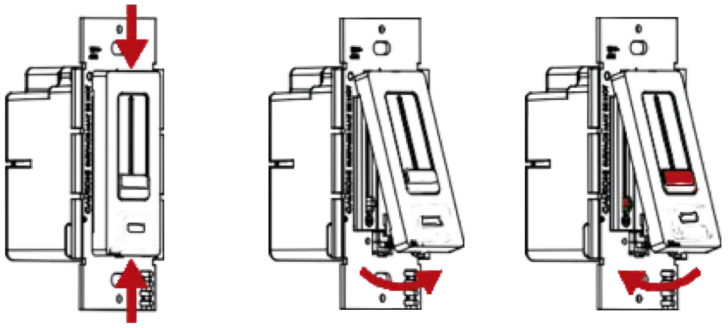
10 – VOLTAGE ADJUSTMENT

xDrive can provide a 1V boost if the fixture is showing noticeable light degradation.

a. Pop off face plate, as shown in figure 5
b. Use a small screwdriver to adjust output voltage by turning adjustment dial clockwise, as shown in figure 6.



a. Gently squeeze top and bottom of face plate.

b. Lift face plate from housing.

c. Insert face plate back into top housing groove. Position housing slider and face plate slider at min brightness (bottom level) and pop on face plate.

Figure 5

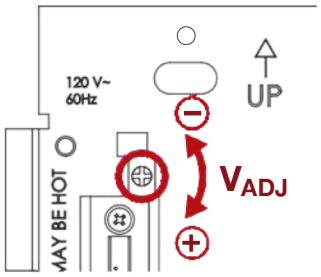


Figure 6

100 W Constant Voltage LED Driver with Integrated Dimmer for Single Gang Box Mount

11 - MECHANICAL DETAILS

Packaging Options: Metal case for 100 W. For 100 W, the wall plate is always made of metal.

I/O Connections: Flying leads, 18 AWG on both AC and DC leads, 152 mm (6”) long, 105°C rated, stripped by approximately 9.5 mm and tinned. All the wires, on both input and output, have a 600 V insulation rating. There is a ground wire attached to the wall plate.

Ingress Protection: IP20 rated

12 – OUTLINE DRAWINGS

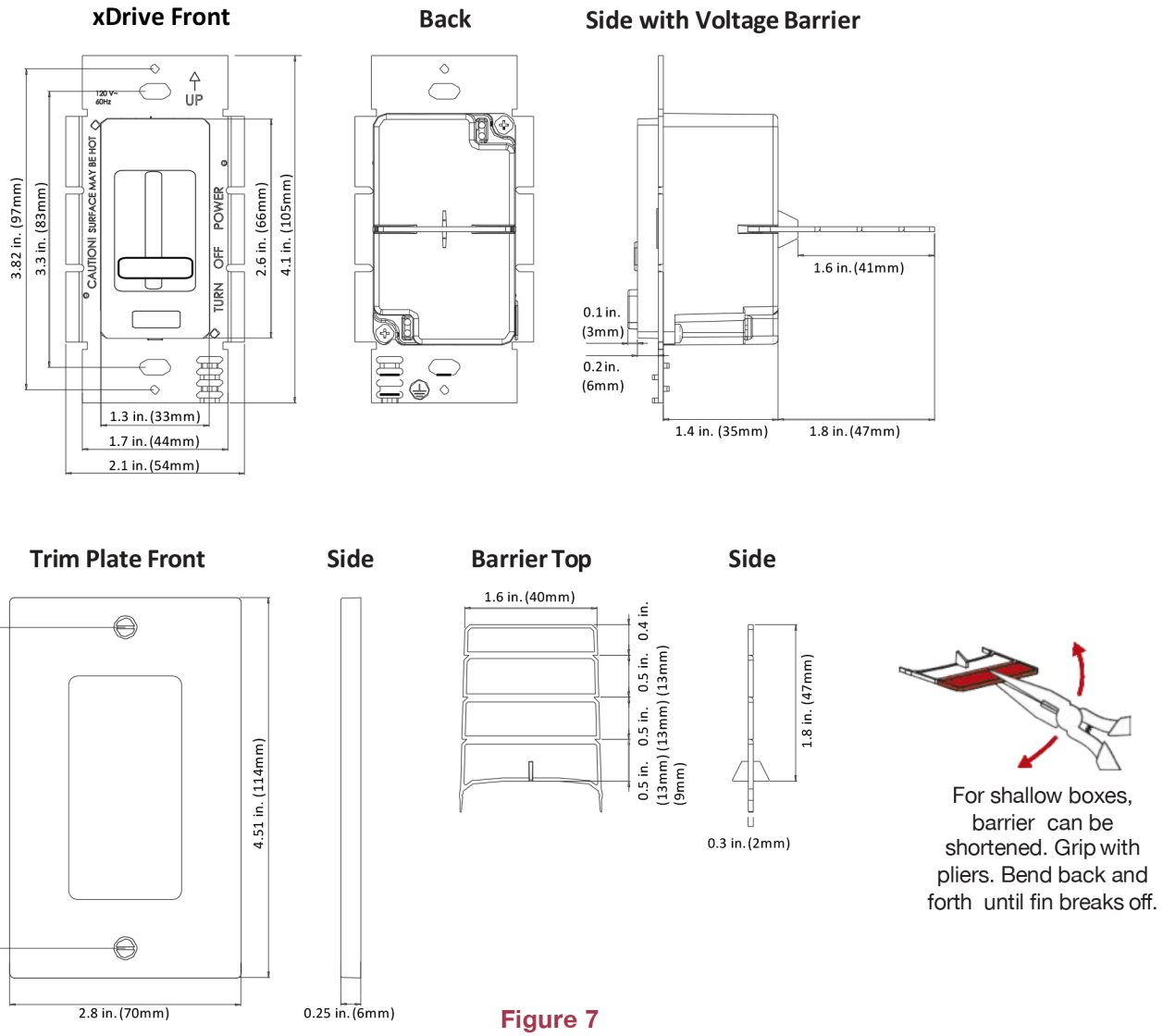


Figure 7

100 W Constant Voltage LED Driver with Integrated Dimmer for Single Gang Box Mount

13 - LABELING

The figure is used as an example to illustrate a typical label.

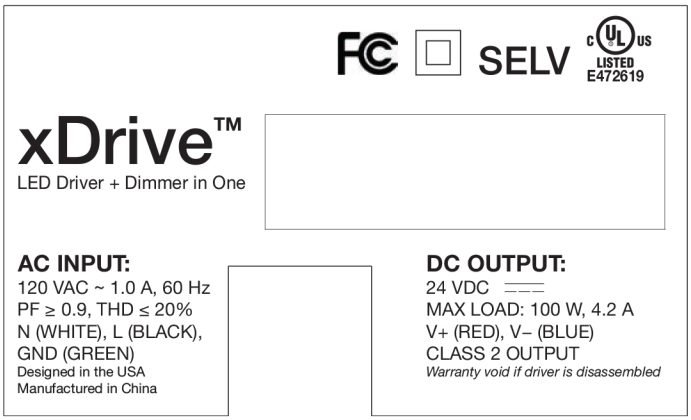


Figure 8

14 – SAFETY/ WARNINGS/ DISCLOSURES

1. UNLIKE TRADITIONAL DIMMING CONTROLS, xDrive REQUIRES UNIQUE WIRING STEPS. READ ALL WARNINGS AND INSTALLATION INSTRUCTIONS THOROUGHLY.
2. Install in accordance with national and local electrical code regulations.
3. This product is intended to be installed and serviced by a qualified, licensed electrician.
4. NEC Code 725.136: Class 1 and Class 2 circuits in same enclosure must be separated by a barrier unless Class 2 circuit conductors are installed in accordance with 725.41 Class 1 Circuits. For example, Non-Metallic (NM) cable is considered a Class 1 circuit conductor. Therefore, if both high voltage and low voltage circuits are installed with NM cable then the voltage barrier is not required for installation.
5. Only install compatible 12 V or 24 V Constant Voltage DC fixtures or warranty will be void.
6. Suitable for indoor / dry installation.
7. To compensate for voltage drop, ensure applicable gauge in-wall rated wire is installed between control and fixture.
8. Do not modify product beyond instructions or warranty will be void.