

## **EnvironmentalLights.com LED Drivers (Non-Dimmable)**



Environmental Lights provides only the highest quality LEDs with the best light output and color rendering on the market, but LEDs are only as good as the driver that powers them. We have tested our products rigorously to ensure that your LEDs will last a long time.

This document describes our non-dimming driver line (adapters, enclosed power supplies and waterproof power supplies). We have fine dimming drivers, and they are larger and more expensive than non-dimming drivers. Do not use the drivers described in this document with dimmers.

LEDs are constant current devices, but if one doesn't know the load in advance because the lights are cuttable or extendable, one must achieve constant current by using a constant voltage source and dividing the voltage over 3 or 6 LEDs and a resistor or current control device in each cut or link segment. One can only use a constant current source if the load is fixed by design and not changeable in the field. All the drivers discussed in this note are constant voltage drivers.

In order to understand the technical descriptions and applications please make sure you are familiar with the following terms:

- Driver: Converts Alternating Current (AC) voltage from your building ("line" or "mains" voltage) to Direct Current (DC) for your LEDs. A driver is a specific type of power supply that converts AC to DC voltage.
- Converter: Converts DC voltage to DC voltage. On the primary side, the voltage may vary widely, such as in a vehicle system, where voltage typically ranges from 10 to 14 volts. Most linear LEDs do not have voltage protection, so you should use a

converter to “tame” a wild voltage. Our 12 volt DC converters, for example, convert a voltage between about 10 and 18 volts DC to 12 volts DC. Converters are also power supplies, but we usually call them “converters,” not power supplies.

**Transformer:** Converts AC to a different AC voltage. An example is a 10:1 step down transformer used in landscape lighting in the U.S., which converts 120 VAC to 12 VAC. LEDs are DC devices and generally are not designed to operate on AC, so we don't sell many transformers. Notable exceptions to the rule include 12 VAC track lighting and 12 VAC landscape lighting. In the case of track lighting, most MR16 LED bulbs we sell are designed to accept 12 VAC from the luminaire's transformer or 12 VDC from some driver. In the case of landscape lighting, we DO sell transformers, and they're really good ones.

**Inverter:** Converts DC to AC. Inverters are found in vehicles and solar-powered installations and are typically used to allow one to operate traditional mains voltage lighting or appliances “off grid.” We sell a small 75 watt inverter to operate traditional 120 VAC LED Christmas lights on a vehicle. The inverter plugs into the cigarette lighter and allows you to plug Christmas light strands into it.

**Universal:** All our drivers operate on “universal” input voltage. This means they will accept any of the line voltages commonly found in the world, typically ranging from 100 to 240 VAC or slightly more. Some of our drivers operate on 277 VAC, found in commercial installations in North America. If you intend to use 277 VAC, be sure you select a compatible driver. We indicate the acceptable input voltage range on our website and later in this document.


**Plug shape:** We sell different power cords that are compatible with plugs for North America, Europe, United Kingdom/Hong Kong, and Australia/New Zealand/Argentina.


**Primary:** Input side.


**Secondary:** Output side.


**PFC:** Power factor correction is a feature that helps to simplify a complex load. With a complex AC load, the current draw does not follow the voltage because the load is capacitive and/or inductive. Power factor is the cosine of the phase angle between voltage and current. If the current is out of sync with the voltage, you will need more apparent AC power to run the device. The tradeoff is that active PFC consumes extra power in order to make the reactive load look more like a resistive load. Therefore, it will only save money on a very large infrastructure.

**DIN:** Deutsches Institut für Normung, the German Institute for Standardization. “DIN rail” refers to the drawer slides used in computer cabinets, where some of our drivers are installed. Our mounting kits include brackets that slide on the DIN rails.

Description	Part Number
 <b>Power Adapters</b>	
<a href="#">20 Watt 5 VDC Power Supply (North American Plug)</a>	GS25U05-P1J
<a href="#">24 Watt 12 VDC Power Supply (North American Plug)</a>	Driver-24-12-NA
<a href="#">24 Watt 24 VDC Power Supply (North American Plug)</a>	Driver-24-24-NA
<a href="#">30 Watt 5 VDC Power Supply</a> (North American, European, UK/HK or Australia/New Zealand/Argentina plugs available)	GS60A05-P1J-NA, -Euro, -UK, -Aus
<a href="#">60 Watt 12 VDC Power Supply</a> (North American, European, UK/HK or Australia/New Zealand/Argentina plugs available)	Driver-60-12-NA, -Euro, -UK, -Aus
<a href="#">60 Watt 24 VDC Power Supply</a> (North American, European, UK/HK or Australia/New Zealand/Argentina plugs available)	Driver-60-24-NA, -Euro, -UK, -Aus
<a href="#">96 Watt 24 VDC Power Supply</a> (North American plug)	Driver-96-24-NA
<a href="#">100 Watt 12 VDC Power Supply</a> (North American, European, UK/HK or Australia/New Zealand/Argentina plugs available)	Driver-100-12-NA, -Euro, -UK, -Aus

 <b>Enclosed Power Supplies</b>	
150 Watt 5 VDC Power Supply with PFC	SP-150-5
<a href="#">150 Watt 12 VDC Power Supply with PFC</a>	SP-150-12
<a href="#">150 Watt 24 VDC Power Supply with PFC</a>	SP-150-24
<a href="#">225 Watt 5 VDC Power Supply with PFC</a>	SP-240-5
<a href="#">240 Watt 12 VDC Power Supply with PFC</a>	SP-240-12
<a href="#">240 Watt 24 VDC Power Supply with PFC</a>	SP-240-24
<a href="#">275 Watt 5 VDC Power Supply with PFC</a>	SP-320-5
<a href="#">300 Watt 12 VDC Power Supply with PFC</a>	SP-320-12
<a href="#">312 Watt 24 VDC Power Supply with PFC</a>	SP-320-24
<a href="#">425 Watt 5 VDC Power Supply with PFC</a>	SP-480-5
<a href="#">480 Watt 12 VDC Power Supply with PFC</a>	SP-480-12
<a href="#">480 Watt 24 VDC Power Supply with PFC</a>	SP-480-24
<a href="#">600 Watt 5 VDC Power Supply with PFC</a>	SP-750-5
<a href="#">750 Watt 12 VDC Power Supply with PFC</a>	SP-750-12
<a href="#">750 Watt 24 VDC Power Supply with PFC</a>	SP-750-24

Description	Part Number
 <b>Converters (dirty DC to clean DC)</b>	
<a href="#">Overvoltage protection-5 VDC maximum output, 50 Watt (DC to DC Step Up/Down Buck Boost Converter)</a>	SD-50A-5
<a href="#">Overvoltage protection-12 VDC maximum output, 50 Watt (DC to DC Step Up/Down Buck Boost Converter)</a>	SD-50A-12
<a href="#">Overvoltage protection-24 VDC maximum output, 50 Watt (DC to DC Step Up/Down Buck Boost Converter)</a>	SD-50B-24
<a href="#">Overvoltage protection-12 VDC maximum output, 100 Watt (DC to DC Step Up/Down Buck Boost Converter)</a>	UDC-2812-8
<a href="#">Overvoltage protection-24 VDC maximum output, 100 Watt (DC to DC Step Up/Down Buck Boost Converter)</a>	SD-100B-24

 <b>Driver Mounting Kits</b>	
<a href="#">SP-150 Driver Mounting Kit</a>	SP-150-MK
<a href="#">SP-240 Driver Mounting Kit</a>	SP-240-MK
<a href="#">SP-320 Driver Mounting Kit</a>	SP-320-MK
<a href="#">SP-480 Driver Mounting Kit</a>	SP-480-MK
<a href="#">SP-750 Driver Mounting Kit</a>	SP-750-MK
<a href="#">SD-50-100 Driver Mounting Kit</a>	SD-50-100-MK



## Waterproof Power Supplies

<a href="#"><u>30 Watt 5 VDC Waterproof Power Supply</u></a>	LPV-35-5
<a href="#"><u>35 Watt 12 VDC Waterproof Power Supply</u></a>	LPV-35-12
<a href="#"><u>35 Watt 24 VDC Waterproof Power Supply</u></a>	LPV-35-24
<a href="#"><u>40 Watt 5 VDC Waterproof Power Supply</u></a>	LPV-60-5
<a href="#"><u>60 Watt 5 VDC Waterproof Power Supply</u></a>	LPV-100-5
<a href="#"><u>60 Watt 12 VDC Waterproof Power Supply</u></a>	LPV-60-12
<a href="#"><u>60 Watt 24 VDC Waterproof Power Supply</u></a>	LPV-60-24
<a href="#"><u>100 Watt 12 VDC Waterproof Power Supply</u></a>	LPV-100-12
<a href="#"><u>100 Watt 24 VDC Waterproof Power Supply</u></a>	LPV-100-24
<a href="#"><u>150 Watt 12 VDC Waterproof Power Supply with PFC</u></a>	HLG-150H-12
<a href="#"><u>150 Watt 24 VDC Waterproof Power Supply with PFC</u></a>	HLG-150H-24
<a href="#"><u>192 Watt 12 VDC Waterproof Power Supply with PFC</u></a>	HLG-240H-12
<a href="#"><u>240 Watt 24 VDC Waterproof Power Supply with PFC</u></a>	HLG-240H-24
<a href="#"><u>264 Watt 12 VDC Waterproof Power Supply with PFC</u></a>	HLG-320H-12
<a href="#"><u>320 Watt 24 VDC Waterproof Power Supply with PFC</u></a>	HLG-320H-24
<a href="#"><u>480 Watt 12 VDC Waterproof Power Supply with PFC</u></a>	HLG-600H-12
<a href="#"><u>600 Watt 24 VDC Waterproof Power Supply with PFC</u></a>	HLG-600H-24

## Power Adapters

These universal power adapters require minimal wiring and are ideal for small projects. Most are available with plugs for North America, Europe, United Kingdom/Hong Kong, Australia/New Zealand/Argentina.



24 Watt Adapter



60 Watt Adapter



96 Watt 24 VDC Adapter



Female Mini Plug Adapter

## Features

- Available in 5, 12 or 24 volts DC output (constant voltage.)
- Accepts 100-240 volts AC input (or broader range), 50-60 Hertz, auto-sensing.
- Super energy-efficient: they consume almost no power in the no-load state.
- UL and CE.
- Adapters use 2.1mm inside diameter plugs compatible with female mini plug above, use female mini plug if you need to work with bare wires.

## Applications

Suitable for small projects using our LED strip lighting, modules and certain under cabinet bars.

## Specifications

Part No.	GS25U05-P1J	GS60A05-P1J	Driver-24-12	Driver-60-12	Driver-100-12	Driver-24-24	Driver-60-24	Driver-96-24
Rated Output Power (Watts)	20	30	24	60	100	24	60	96
Output Potential (VDC)	5	5	12	12	12	24	24	24
Output Current (amps)	4	6	2	5	8.3	1	2.5	4
Input Potential (VAC)	100-240	100-240	100-240	100-240	100-240	100-240	100-240	100-240
Input Auto-sensing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length (mm)	79	127	95	127	165	95	127	235
Width (mm)	54	51	48	53	62	48	53	63
Height (mm)	53	32	55	34	41	55	34	40
Length (in)	3.10	5.00	3.74	5.00	6.50	3.74	5.00	9.25
Width (in)	2.14	2.00	1.89	2.10	2.45	1.89	2.10	2.48
Height (in)	2.10	1.25	2.17	1.35	1.60	2.17	1.35	1.57
Input Cord (ft)	N/A	N/A	N/A	5	5	N/A	5	5
Output Cord (ft)	4	6	6	6	4	6	6	1.5 to Y, then 2
Warranty (years)	2	2	1	1	1	1	1	1

## Enclosed Power Supplies

### Drivers

We offer an entire line of drivers in 5, 12 and 24 volts to power our LED strip lighting at full intensity. Optional plugs for North America, Europe, United Kingdom/Hong Kong, Australia/New Zealand/Argentina are sold separately.



SP-150



SP-240



SP-320



SP-480



SP-750

### Features

- Available in 5, 12 or 24 volts DC output, with fine-tune adjustment screw (constant voltage.)
- Accepts 90-264 volts AC input (or broader range), 50-60 Hertz, auto-sensing.
- Protections: Short circuit / Overload / Over voltage / Over temperature.
- Full load burn-in tested.
- Low ripple noise.
- Touch-guard screw terminals.
- UL and CE.

### Applications

Suitable for use with LED strip lighting, modules and certain under cabinet bars. You must choose a driver with the correct voltage for the lights you select.

# Specifications

Part No.	SP-150	SP-240	SP-320	SP-480	SP-750
Rated Output Power (Watts)	150/150/150	225/240/240	275/300/312	425/480/480	600/750/750
Output Potential (VDC)	5/12/24	5/12/24	5/12/24	5/12/24	5/12/24
Output Current (amps)	30/12.5/6.3	45/20/10	55/25/13	85/40/20	120/62.5/31.3
Input Potential (VAC)	85-264	88-264	88-264	85-264	90-264
Input Auto-sensing	Yes	Yes	Yes	Yes	Yes
Power Factor Correction	Yes	Yes	Yes	Yes	Yes
Output Voltage Adjust	Yes	Yes	Yes	Yes	Yes
Voltage Compensation	No	No	No	Yes	Yes
Remote Control	No	No	No	Yes	Yes
Mounting Kit	SP-150-MK	SP-240-MK	SP-320-MK	SP-480-MK	SP-750-MK
Length (in)	7.8	7.5	8.5	10.9	10.9
Width (in)	3.9	3.7	4.5	5.0	5.0
Height (in)	2.0	2.0	2.0	1.7	2.5
Length (mm)	199	190	215	278	278
Width (mm)	99	93	115	127	127
Height (mm)	50	50	50	43	63.5
Warranty (years)	3	3	3	3	3

## Converters

Buck-Boost DC/DC Converters will accept DC input voltage that is higher or lower than the output voltage. For example, a converter would allow you to use 12 volt DC LEDs on a boat or vehicle, where the charging circuitry ordinarily exceeds 12 volts and would otherwise damage your LEDs.



50 Watt 5 Volt DC  
SD-50A-5  
50 Watt 12 Volt DC  
SD-50A-12



50 Watt 24 Volt DC  
SD-50B-24



100 Watt 12 Volt DC  
UDC-2812-8



100 Watt 24 Volt DC  
SD-100B-24

## Features

- Available in 5, 12 or 24 volts DC output (constant voltage.) Note: the input range for the 5 volt converter is 9.2-18 VDC.
- Accepts DC input and bucks or boosts voltage to protect LEDs.
- Touch-guard screw terminals.



## Applications

Use a converter to protect DC LED systems on vehicles, solar systems, or other off-grid systems in which the charging system may spike above the desired voltage.

## Specifications

Part No.	SD-50A-5	SD-50A-12	SD-50B-24	UDC-2812-8	SD-100B-24
Rated Output Power (Watts)	50	50	50	100	100
Output Potential (VDC)	5	12	24	12	24
Output Current (amps)	10	4.2	2.1	8	4.2
Input Potential (VDC)	9.2-18	9.2-18	19-36	10-30	19-36
Mounting Kit	SP-50-100-MK	SP-50-100-MK	SP-50-100-MK	Mounting tabs	SP-50-100-MK
Length (mm)	159	159	159	305	199
Width (mm)	97	97	97	89	98
Height (mm)	38	38	38	41	38
Length (in)	6.3	6.3	6.3	12.0	7.8
Width (in)	3.8	3.8	3.8	3.5	3.9
Height (in)	1.5	1.5	1.5	1.6	1.5
Warranty (years)	2	2	2	1	2

## Connections

This section explains the different markings on the driver and what those terminals are used for. Certain features are not available on all power supplies. See the comparison tables above.

<b>L</b>	AC Input Line
<b>N</b>	AC Input Neutral
$\perp$	AC Input Ground
<b>+V</b>	Load Terminal (Anode)
<b>-V</b>	Load Terminal (Cathode)
<b>+S</b>	Voltage Compensation (Anode)
<b>-S</b>	Voltage Compensation (Cathode)
<b>RC</b>	Remote Control
<b>RCG</b>	Remote Control Ground
<b>PF</b>	Power Fail Signal
<b>NC</b>	No Connection



Most people DO NOT use voltage compensation or a remote control switch and follow these general instructions:

1. With the power off, wire the primary side by connecting neutral from your building to the N terminal, line voltage from your building to the L terminal and ground to the ground terminal. In the U.S., typically, neutral is white, line is black and ground is green.

2. Wire the secondary by connecting +V to red (anode of your LEDs) and -V to black (cathode). If you have more than one +V terminal, they are connected internally (same for -V). These drivers are single-rail, and you do not need to worry about splitting the load evenly over the various output terminals.

**Remote Control Feature (if applicable):** It's easy enough to turn your driver off by using a switch to interrupt the input current; however, some enclosed drivers offer a remote control function, which allows you to turn the driver on or off using a separate switch. The advantage of doing this is that the switch does not need to carry the entire current used by the driver, so the switch can be smaller and use smaller wire than if it were used to interrupt the line current to the driver. To use the remote control function (if provided, as shown in the table above) remove the jumper from the RC terminals and connect a switch between RC and RCG (or the other RC terminal) to turn the power supply on and off.

**Voltage Compensation Feature (if applicable):** Voltage compensation is offered on the SP-480 and SP-750 drivers. Voltage compensation means that you can feed back the voltage from your system to the driver and it will raise the created voltage to compensate for any voltage drop it senses on the signal you provide to the S terminals. The power supply can provide up to 1 extra volt at the output terminals. If you lose more than 1 volt due to line resistance between the power supply and the load, do not use the voltage compensation or the power supply will enter overload (hiccup) mode. To use voltage compensation, remove the jumpers from the voltage compensation terminals and connect them to the load in order to compensate for line resistance over a long distance. **WARNING: You must connect the voltage compensation to your line in front of the first LEDs. Otherwise, the driver will raise the voltage over 12 or 24 volts and damage the LEDs.**

We offer optional power cords for North America (NA), Europe (Euro), United Kingdom/Hong Kong (UK) and Australia, New Zealand and Argentina (Aus). Each one has lugs to make connecting to the enclosed power supplies a breeze:



[PowerCord-NA](#)

[PowerCord-Euro](#)

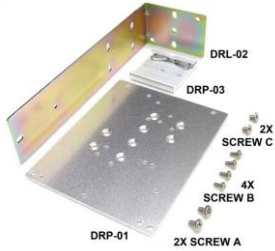
[PowerCord-UK](#)

[PowerCord-Aus](#)

# Driver Mounting Kits

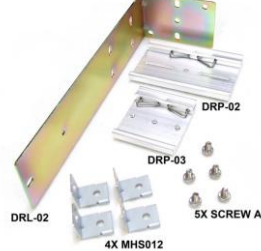
We now offer mounting hardware to give our customers many different options for securing their power supplies. Some of them come with brackets for mounting the driver to a surface and DIN rail slides for placing it in a cabinet. Extra screws and parts may be ordered separately.

SD-50-100 Mounting Kit



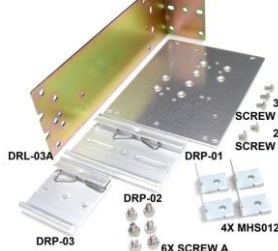
SD-50-100-MK

SP-150 Mounting Kit



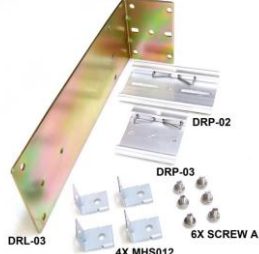
SP-150-MK

SP-240 Mounting Kit



SP-240-MK

SP-320 Mounting Kit



SP-320-MK

SP-480 Mounting Kit



SP-480-MK

SP-750 Mounting Kit



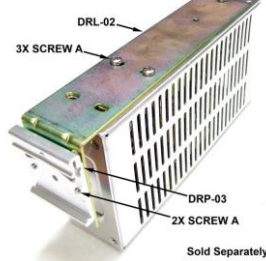
SP-750-MK

Here are some examples of different ways the SP-150 mounting kit can be configured:

SP-150 Mounting Kit



SP-150 Mounting Kit



SP-150 Mounting Kit



SP-150 Mounting Kit



## Waterproof Power Supplies (Drivers)

These waterproof power supplies are completely sealed and perfect for fountains, landscapes, and other outdoor lighting installations. HLG-100H is not pictured, but available.



LPV-35

LPV-60

LPV-100



HLG-150H

HLG-240H

HLG-320H

HLG-600H

## Features

- Available in 5, 12 or 24 volts DC output (constant voltage.)
- Accepts 90-264 volts AC input, 50-60 Hertz, auto-sensing (90-305 AC for HLG series.)
- Protection: Short circuit / Overload / Over voltage.
- Super energy-efficient: it consumes almost no power in the no-load state.
- IP67 waterproof rating, fully encapsulated.
- UL class depends on wattage.

## Applications

Suitable for outdoor use with our LED strip lighting or waterproof LED strip lighting.

# Specifications

<b>Part No.</b>	<b>LPV-35</b>	<b>LPV-60</b>	<b>LPV-100</b>	<b>HLG-150H</b>	<b>HLG-240H</b>	<b>HLG-320H</b>	<b>HLG-600H</b>
Rated Output Power (Watts)	30/35/35	40/60/60	60/102/100.8	150/150	192/240	264/320	480/600
Output Potential (VDC)	5/12/24	5/12/24	5/12/24	12/24	12/24	12/24	12/24
Output Current (amps)	6/2.9/1.5	8/5/2.5	12/8.5/4.2	12.5/6.3	16/10	22/13.3	40/25
Input Potential (VAC)	90-264	90-264	90-264	90-305	90-305	90-305	90-305
Input Potential (VDC)	No	No	127-370	127-431	127-431	127-431	127-431
Input Auto-sensing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Factor Correction	No	No	No	Yes	Yes	Yes	Yes
Length (mm)	148	162.5	190	228	244.2	252	280
Width (mm)	40	42.5	52	68	68	90	144
Height (mm)	30	32	37	38.8	38.8	42	48.5
Input Cord (mm)	600	600	300	300	300	300	300
Output Cord (mm)	600	600	300	300	300	300	300
Length (in)	5.8	6.4	7.5	9.0	9.6	9.9	11.0
Width (in)	1.6	1.7	2.0	2.7	2.7	3.5	5.7
Height (in)	1.2	1.3	1.5	1.5	1.5	1.7	1.9
Input Cord (in)	23.6	23.6	11.8	11.8	11.8	11.8	11.8
Output Cord (in)	23.6	23.6	11.8	11.8	11.8	11.8	11.8
Warranty (years)	2	2	2	5	5	5	5

## Design Criteria for Dimmers and Power Supplies

We generally recommend using 25% oversizing (5/4 of estimated actual power consumption.) These numbers are conservative, since additional margin for error is built into the ratings of the power supplies themselves. Using a more powerful driver than you need is not a problem for these components.

**This is really important. We get questions about it every day. There are two limits you need to keep in mind:**

1. How much load can you put on each driver? (See the following charts to answer that.)
2. How much wire and lighting can you drive in one branch without making a home run to the driver? The answer is generally one “unit of sale,” which is a reel or set of modules. In the case of our high brightness undercabinet lights, it’s about 8 feet (2.4 meters.)

**They are very different concepts.** Examples:

1. **How much load can you put on each driver?**

Let’s say you put 5 reels of 24 watt regular strip on a 60-watt driver. You don’t violate #2 above, but you do violate #1. The driver’s not big enough and your installation won’t work. You need a more powerful driver.

2. **How much wire and lighting can you drive in one branch without making a home run to the driver?**

Let’s say you have a 150-watt driver and you connect 50 feet (about 3 reels) of regular strip lights in a single line. You don’t violate #1-your driver is large enough (150>> 24 watts x 3 reels.) You do exceed the branch length limit of 16-20 feet, so after 20 feet your lights will become ever dimmer. In an RGB installation, they will be the wrong color and appear to respond strangely to the controller. Shorten your branches by making home runs to the driver or controller.

Or, let’s say you want to put the same 3 reels of regular strip light at the end of a 50 foot run of 18 gauge wire. Using 12 volts, 18 gauge, 6 amps load and 50 feet, we calculate you’ll drop 3.95 volts. If you power your head end with 8 volts, it will barely light. At the tail end of each reel, it will probably be dark. You need thicker wire or a shorter run. Put the driver closer to the lights, if you can. Using a higher wattage driver won’t help with this problem. You could adjust the driver voltage up to compensate for the drop, but very few drivers allow enough adjustment to accomplish that, plus if you have any lights closer to the driver, you run the risk of burning them out with excessive voltage (and, therefore, current.)

Use thicker wire, make more home runs and move your drivers, controllers or boosters closer to the lights.

## **Frequently Asked Questions**

**Q: What wire should I use between my power supply and my LEDs?**

A: The required wire gauge depends on length and power consumption. Call us at 1-888-880-1880 with the details of your project and a qualified sales engineer will calculate the wire gauge that you need.

**Q: Where should I put the power supply?**

A: Drivers must be placed in a well-ventilated area so they do not overheat. If you are using a standard non-waterproof driver outdoors, use a NEMA enclosure that keeps water out and maintains good airflow.

**Q: Does the power supply include a cord?**

A: No cord is included unless specified in the title.