

# GREENSTAR LIGHTING SOLUTIONS

---

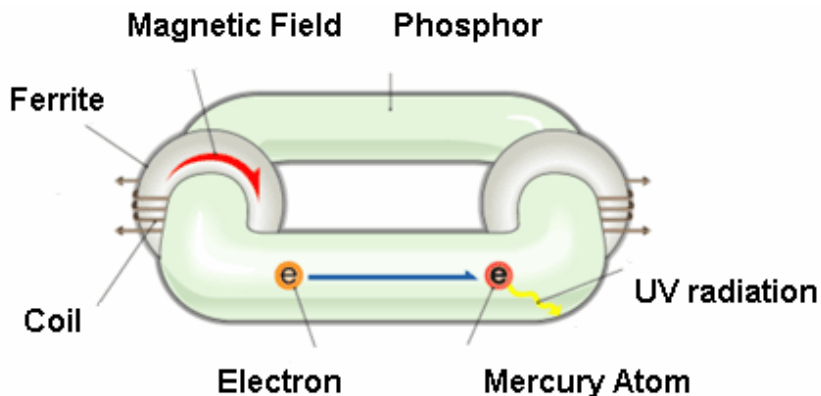
## Principle of Litro Lighting

---

The principle of Litro Lighting was introduced to the world by the scientist Nicola TESLA in the 1800's. TESLA once lit 200 lamps without wires from 25 miles away.

Litro Lighting is similar to fluorescent lights in that they use gasses, which once 'excited', react with the phosphor that coats the tubes to produce white light. Fluorescent lamps use electrodes to 'excite' the gasses inside of the tube. These electrodes degrade with time, eventually causing the light to fail. Unlike fluorescent lamps, Litro Lamps do not use electrodes but instead uses the principle of INDUCTION (the transmission of energy by way of magnetic field). Think of it as wireless lighting.

Although Litro lighting systems come in different shapes and sizes, the operating principles are essentially the same. They all include a ballast, a power coupling and a glass lamp housing which is called the discharge bulb.



---

## Characteristics of Litro Lighting

---

- Long Life - 100,000 hours • Color rendering - 85 CRI
- Color Temperature - 2,700K-6,500K • Energy Efficient - 85+ Lumens per Watt
- Lumen maintenance - 70% of its light output at 100,000 hours
- Maintenance costs - go 10 years with out a change out
- Instant on Capability - Can be used with photocell or motion sensor
- High Output - 70W to 400W
- No flickering, No Strobing, No Noise

# GREENSTAR LIGHTING SOLUTIONS

---

## Benefits of Litro Lighting

---

### Energy Savings

In today's market, energy cost savings are probably the number one reason for business owners and facility managers to consider upgrading from inefficient HID type lighting. High intensity discharge fixtures were the fixtures of choice for more than 30 years and still continue to be installed in new construction because architects, specifiers, and end users have either not been aware of the long term costs associated with metal halide fixtures or simply did not care by focusing only on the initial fixture costs.

### Maintenance Savings

In the long term, Litro lamps and ballasts on average will outlast HID's by at least 400% and are considerably cheaper to replace. One large drawback of HID systems is that they must be turned off to replace the bulb resulting in maintenance having to work after hours or alternatively shut down a whole circuit of lighting to simply replace a bulb. Fluorescent bulbs are often replaced with the power still on and there is no waiting for the fixtures to restart due to the instant re-strike.

### Improved Lumen Maintenance

The Achilles heel of HID lighting is its poor lumen maintenance. The amount of light output produced by an HID lamp decreases dramatically with age. Standard metal halide lamps lose on average 55% of their lumen output by the time they reach their "rated lamp life". It is not uncommon to find HID lamps still operating well beyond their rated life producing only 15-25% of their original lumens. The newer style pulse-start lamps fair a little better by retaining around 57% of their lumens at end of lamp life. Regardless of how dim the HID lamps get over time they will still use the same amount of electricity as when they were new. If a building owner were to request a set level of light at the workplace he will only get that light level for the first few thousand hours of operation, after which time the facility will be perpetually under lit, and usually the lamp depreciation will go unnoticed until long after the lighting contractor is gone. Compare this lumen loss to Litro lighting that retain up to 75% of their light output over their rated life of 100,000 hours.

### Improved Lighting Quality

Workplace lighting is the least expensive and most important component influencing work place performance. This fact has been documented in numerous studies conducted by colleges and universities, private industry and federal governments around the globe. Numerous case histories illustrate dramatic increases in worker productivity when lighting is improved and equally dramatic worker productivity drop offs when lighting is downgraded. High workplace productivity is essential for the survival of just about every business and leads to an increased competitive edge and long term financial stability for the firm involved. Litro fixtures and lamps feature the highest color rendering of any fixture on the market with a natural 5,000 Kelvin color temperature. Litro Lights with their enhanced scotopic qualities have been shown to increase contrast recognition leading to lower error rates, increased safety and improved energy levels in a work environment.

### Instant Re-Strike

All HID bulbs when shut off must cool in order to be restarted. This time is typically a minimum of 10-15 minutes making it difficult, if not impossible, to use occupancy sensors or even simply change a burnt out bulb quickly. Litro fixtures offer instant re-striking with no waiting for the lamps to re-start and can easily accommodate occupancy or daylight sensors.

### Reduced UV Emissions and Fire Risks

All HID bulbs produce a considerable amount of UV-A and some UV-B. The higher mounting heights help to mitigate its effects but UV emissions are still striking the surface of objects and employees. There have been instances where a cracked bulb has resulted in UV emissions great enough to sunburn large quantities of people at sporting events. HID arc tube ruptures have been known to cause fires in warehouses and industrial applications. The National Electrical Manufacturing Association (NEMA) recommends that HID lights be switched off for 15-minute periods because the periodic cycling of the lamp, and the subsequent cooling and heating of the arc tube, allows for cracks to propagate while the internal arc tube pressure is low preventing a violent failure and fire (the bulb will burst during start up). In addition NEMA advise customers not to store flammable, combustible, or oxidizing materials beneath any HID luminaries.

# GREENSTAR LIGHTING SOLUTIONS

## Ridgeline Highbay



- Wattage: 200W
- Long life: Average life of 100,000 hours
- High index, CRI: 85 makes colors look more true and vibrant
- Vibration resistant: electrodeless design allow for use in high-vibration applications
- Instant on
- Instant restrike
- Applications: Warehouse, Retail, Show Rooms, Repair Facilities
- 22"W x 30.7"H

### SPECIFICATION

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
200	15,000-16,000	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
200	120/277	1.06	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Die cast aluminum control gear painted gray
- 22" clear prismatic refractor for long-term resistance to color fading and optimum direction of light
- Protection class: IP43 (Solid bodies diameter 1mm and rainfall)

### ORDERING GUIDE

Example: RI21150C-5

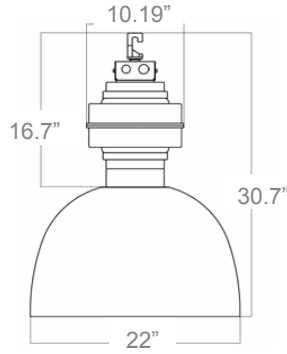
Series	Family	Voltage	Wattage	Lamp	Kelvin
RI				C	-
	1: Enviro 2: Nexlume	1: 120V 2: 277V	200: 200 Watts	C: Circle	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

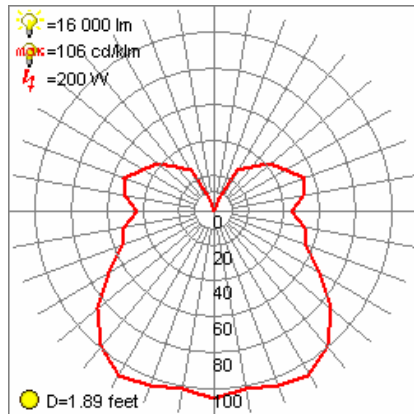
## Ridgeline Highbay



### Dimensions



### Photometrics



### Economics

Highbay Litro	
<b>Wattage</b>	200W
<b>CRI</b>	85
<b>Lamp Life</b>	100,000
<b>Pupil Lumens</b>	27,540
<b>Oper Costs</b>	\$2,144
<b>EZ install</b>	Screw in lamp
Metal Halide	
<b>Wattage</b>	400W
<b>CRI</b>	65
<b>Lamp Life</b>	10,000
<b>Pupil Lumens</b>	14,900
<b>Oper Costs</b>	\$3,022

\*Based on 0.12 KW/H, 10 years of use, 8760 hours/year

# GREENSTAR LIGHTING SOLUTIONS

## Empire Linear Highbay



- Wattage: 400W
- Die cast aluminum with electrostatic painted surface for heat-resistance, corrosion-resistance and long life
- Mounting: suspended by pole or chains
- Long life: Average life of 100,000 hours
- High index, CRI: 85 makes colors look more brighter and vibr
- Vibration resistant: electrodeless design allow for use in high-vibration applications
- 5 year warranty

### Specification

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
400	32,000	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
400	120/277	1.93	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Die cast aluminum with powder coat white finish
- Protection class: IP43 (solid bodies diameter 1mm and rainfall)

### Ordering Guide

Example: EM11400S-5

Series	Family	Voltage	Wattage	Lamp	Kelvin
EM	1		400	S	-
		1: 120V 2: 277V		S: Square	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

## Endura Canopy



- Wattage: 80W and 100W
- Long life: Average life of 100,000 hours
- High index, CRI: 85 makes colors look more true and vibrant
- Vibration resistant: electrodeless design is perfect for multi parking structures
- Instant on
- Instant restrike
- Applications: Parking Garages and walkways
- 12.5"W x 12.5"L x 10.6"H

### Specifications

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
80	5,200-6,000	85	2,700 - 5,000	100,000
100	6,900-8,000	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
80	120/277	0.42	50-60Hz	0.98	-30 to 122°F	230KHz
100	120/277	0.51	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Die cast aluminum casing with powder coat carbon gray finish will withstand the elements
- UV-proof heat-resistant polycarbonate lens won't turn yellow
- Heavy gauge cold rolled steel reflector for optimum performance and life
- Protection class: IP43 (solid bodies diameter 1mm and rainfall)

### Ordering Guide

Example: EN21150C-5

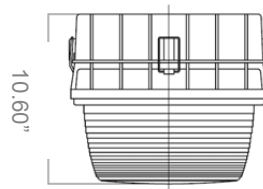
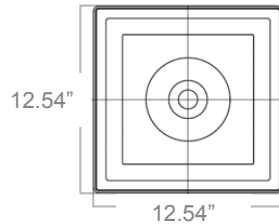
Series	Family	Voltage	Wattage	Lamp	Kelvin
EN				C	-
		1: 120V 2: 277V	080: 80 Watts 100: 100 Watts	C: Circle	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

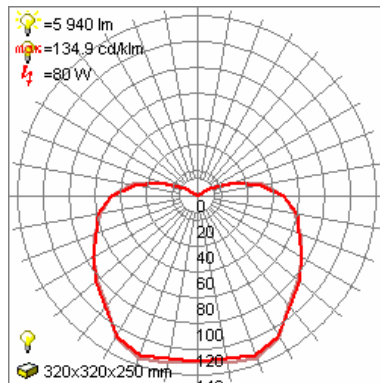
## Endura Canopy



### Dimensions



### Photometrics



### Economics

Endura Litro		Endura Litro	
<b>Wattage</b>	80W	<b>Wattage</b>	100W
<b>CRI</b>	85	<b>CRI</b>	85
<b>Lamp Life</b>	100,000	<b>Lamp Life</b>	100,000
<b>Pupil Lumens</b>	11,016	<b>Pupil Lumens</b>	13,770
<b>Oper Costs</b>	\$858*	<b>Oper Costs</b>	\$1,072*
<b>EZ install</b>	Screw in lamp Mounting Plate	<b>EZ install</b>	Screw in lamp Mounting Plate
High Pressure Sodium		Metal Halide	
<b>Wattage</b>	150W	<b>Wattage</b>	175W
<b>CRI</b>	21	<b>CRI</b>	65
<b>Lamp Life</b>	24,000	<b>Lamp Life</b>	10,000
<b>Pupil Lumens</b>	7,200	<b>Pupil Lumens</b>	14,900
<b>Oper Costs</b>	\$2,245*	<b>Oper Costs</b>	\$3,022*

\*Based on 0.12 KW/H, 10 years of use, 8760 hours/year

# GREENSTAR LIGHTING SOLUTIONS

## Diamond Wall Pack



- Wattage: 80W and 100W
- Long life: Average life of 100,000 hours
- High index, CRI: 85 makes colors look more true and vibrant
- Vibration resistant: electrodeless design allow for use in high vibration applications
- Instant on
- Instant restrike
- Applications: Commerical buliding and warehouses
- 13"D x18"W x 9"H

### Specification

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
80	5,200-6,000	85	2,700 - 5,000	100,000
100	6,900-8,000	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
80	120/277	0.42	50-60Hz	0.98	-30 to122°F	230KHz
100	120/277	0.51	50-60Hz	0.98	-30 to122°F	230KHz

#### Housing

- Die cast aluminum casing with powder coat carbon gray finish will withstand the elements
- Prismatic glass
- Heavy gauge cold rolled steel reflector for optimum performance and life
- Protection class: IP54 (Dust and splashed water)

### Ordering Guide

Example: DI21080S-5

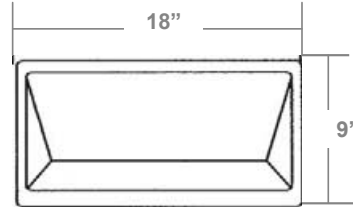
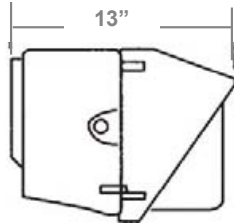
Series	Family	Voltage	Wattage	Lamp	Kelvin
DI	2 2. Nexlume	1: 120V 2: 277V	080: 80 Watts 100: 100 Watts	S S: Square	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

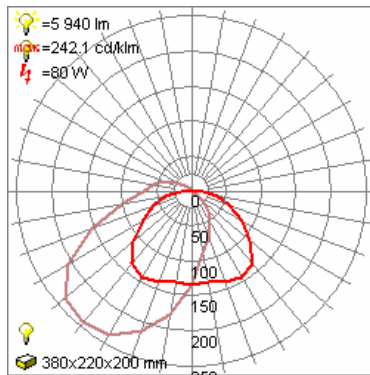
## Diamond Wall Pack



### Dimensions



### Photometrics



### Economics

Diamond Litro	
<b>Wattage</b>	100W
<b>CRI</b>	85
<b>Lamp Life</b>	100,000
<b>Pupil Lumens</b>	7,200
<b>Oper Costs</b>	\$1,072*
Metal Halide	
<b>Wattage</b>	175W
<b>CRI</b>	65
<b>Lamp Life</b>	10,000
<b>Pupil Lumens</b>	14,900
<b>Oper Costs</b>	\$3,022*

\*Based on 0.12 KW/H, 10 years of use, 8760 hours/year

# GREENSTAR LIGHTING SOLUTIONS

## Parker Area Lighting



- Wattage: 100W and 200W.
- Long life: Average life of 100,000 hours.
- High index, CRI: 85 makes colors look more true and brighter
- Vibration resistant: electrodeless design allow for use in high-vibration applications
- Instant on
- Instant restrike
- Applications: Parking Lots, Retail Lots
- 16"W x 16"L x 6.6" H (100W)
- 23.6"W x 23.6L x 10.2"H (200W)

### SPECIFICATION

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
100	6,900-8,000	85	2,700 - 5,000	100,000
200	15,000-16,000	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
100	120/277	0.51	50-60Hz	0.98	-30 to 122°F	230KHz
200	120/277	1.06	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Die cast aluminum casing with electrostatic painted surface for heat-resistance, corrosion-resistance and long life
- Anodized aluminum for superior lighting performance

### ORDERING GUIDE

Example: PA21100C-5

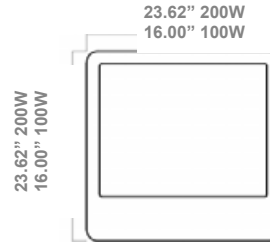
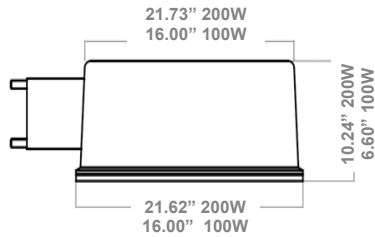
Series	Family	Voltage	Wattage	Lamp	Kelvin
PA	2			C	-
	1. Enviro 2. Nexlume	1: 120V 2: 277V	100: 100 Watts 200: 200 Watts	C: Circle	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

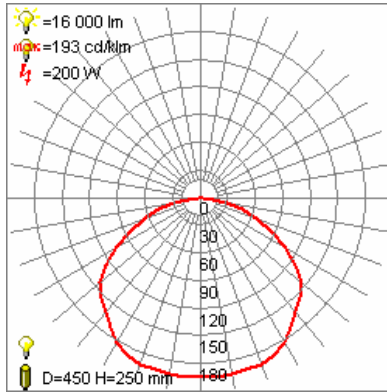
## Parker Area Lighting



### Dimensions



### Photometrics



### Economics

Shoobox Litro	Shoobox Litro
<b>Wattage</b> 100W	<b>Wattage</b> 200W
<b>CRI</b> 85	<b>CRI</b> 85
<b>Lamp Life</b> 100,000	<b>Lamp Life</b> 100,000
<b>Pupil Lumens</b> 7,200	<b>Pupil Lumens</b> 27,540
<b>Oper Costs</b> \$1,072	<b>Oper Costs</b> \$2,144
Metal Halide	Metal Halide
<b>Replaces</b> 175 MH	<b>Wattage</b> 400W
<b>CRI</b> 65	<b>CRI</b> 65
<b>Lamp Life</b> 10,000	<b>Lamp Life</b> 10,000
<b>Pupil Lumens</b> 14,900	<b>Pupil Lumens</b> 42,912
<b>Oper Costs</b> \$3,022	<b>Oper Costs</b> \$5,810

\*Based on 0.12 KW/H, 10 years of use, 8760 hours/year

# GREENSTAR LIGHTING SOLUTIONS

## Cobra Street Lighting



- Wattage: 40W, 80W and 100W.
- High index, CRI: 85 makes colors look more true and vibrant
- Vibration resistant: electrodeless design allow for use in high-vibration applications
- Instant on
- Instant restrike
- Applications: Street Lighting, Area Lighting

### Specification

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
40	2,400-2,800	85	2,700 - 5,000	100,000
80	5,200-6,000	85	2,700 - 5,000	100,000
100	6,900-8,000	85	5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
40	120/277	0.23	50-60Hz	0.98	-30 to 122°F	230KHz
80	120/277	0.42	50-60Hz	0.98	-30 to 122°F	230KHz
100	120/277	0.51	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Die cast aluminum housing with electrostatic painted surface for heat-resistance, corrosion-resistance and long life.
- Glass lens for superior lighting performance.
- Gas tight silicon rubber seal.

### Ordering Guide

Example: CO21100C-5

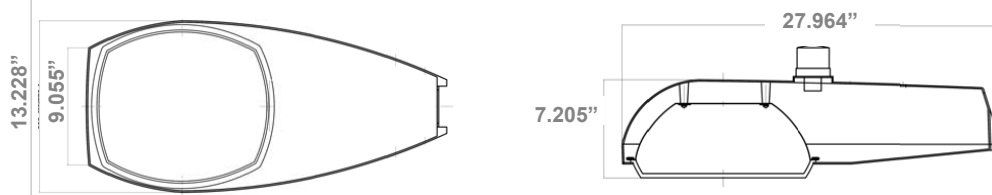
Series	Family	Voltage	Wattage	Lamp	Kelvin
CO	2			C	-
		1: 120V 2: 277V	40: 40 Watts 80: 80 Watts  100: 100 Watts	C: Circle	2: 2,700K 3: 3,500K 4: 4,100K 5: 5,000K

# GREENSTAR LIGHTING SOLUTIONS

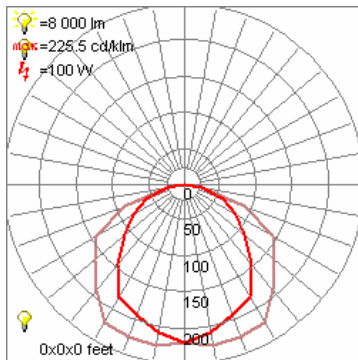
## Cobra Street Lighting



### Dimensions



### Photometrics



### Economics

Cobra Litro	Cobra Litro	Cobra Litro
<b>Wattage</b> 40W	<b>Wattage</b> 80W	<b>Wattage</b> 100W
<b>CRI</b> 80	<b>CRI</b> 80	<b>CRI</b> 80
<b>Lamp Life</b> 100000	<b>Lamp Life</b> 100000	<b>Lamp Life</b> 100000
<b>Pupil Lumens</b> 5508	<b>Pupil Lumens</b> 11016	<b>Pupil Lumens</b> 13770
<b>Oper Costs</b> \$429	<b>Oper Costs</b> \$858	<b>Oper Costs</b> \$1,072
High Pressure Sodium	High Pressure Sodium	High Pressure Sodium
<b>Wattage</b> 70W	<b>Wattage</b> 150W	<b>Wattage</b> 250W
<b>CRI</b> 21	<b>CRI</b> 21	<b>CRI</b> 21
<b>Lamp Life</b> 24000	<b>Lamp Life</b> 24000	<b>Lamp Life</b> 24000
<b>Pupil Lumens</b> 3231	<b>Pupil Lumens</b> 7980	<b>Pupil Lumens</b> 14592
<b>Oper Costs</b> \$1,201	<b>Oper Costs</b> \$2,245	<b>Oper Costs</b> \$3,427

\*Based on 0.12 KW/H, 10 years of use, 8760 hours/year

# GREENSTAR LIGHTING SOLUTIONS

## Daytona Tunnel Lighting



100W



200W



400W

- Wattage: 100W, 200W and 400W
- High index, CRI: 85 makes colors look more brighter and vibrant
- Vibration resistant: electrodeless design allow for use in high-vibration applications
- Instant on
- Instant restrike
- 5 Year Warranty

### Specification

#### Litro Lamp

Wattage (W)	Luminance (LM)	CRI	Color temperature (Kelvin)	Average lifetime (Hours)
100	7,700	85	2,700 - 5,000	100,000
200	16,400	85	2,700 - 5,000	100,000
400	34,800	85	2,700 - 5,000	100,000

#### Ballast

Wattage (W)	Input voltage range (VAC)	Input current (A)	Input frequency	Power Factor	Operating Temp	Frequency (KHz)
100	120/277	0.93-0.4	50-60Hz	0.98	-30 to 122°F	230KHz
200	120/277	1.77-0.77	50-60Hz	0.98	-30 to 122°F	230KHz
400	120/277	3.57-1.55	50-60Hz	0.98	-30 to 122°F	230KHz

#### Housing

- Aluminum casing with two extruded side covers
- Anodized aluminum reflector and 5-mm-thick flat toughened glass
- Gas-tight seal, heat-resistant silicon rubber and front opening structure

### Ordering Guide

Example: DA11100S-5

Series	Family	Voltage	Wattage	Lamp	Kelvin
DA	1			S	-
		1: 120V	100: 100 Watts	S: Square	2: 2,700K
		2: 277V	200: 200 Watts		3: 3,500K
			400: 400 Watts		4: 4,100K
					5: 5,000K

?

?

?

?

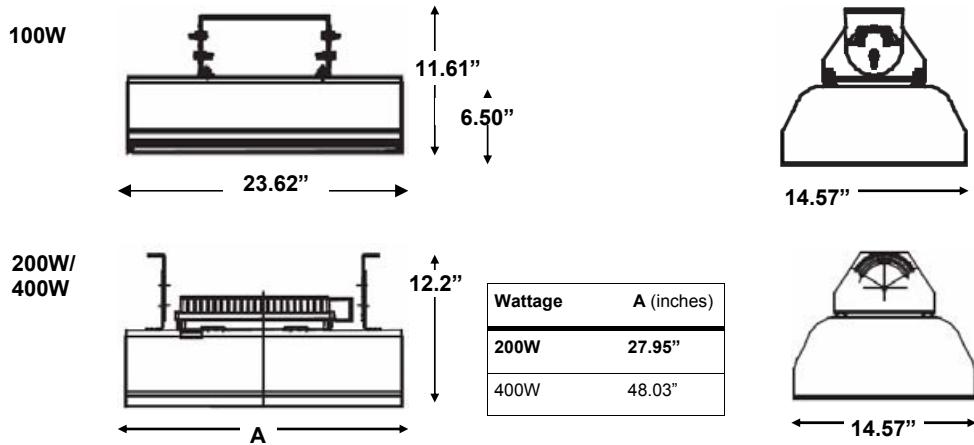
?

# GREENSTAR LIGHTING SOLUTIONS

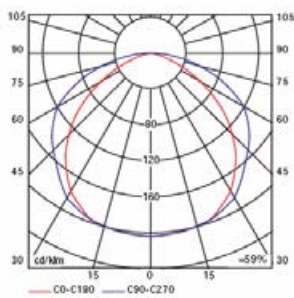
## Daytona Tunnel Lighting



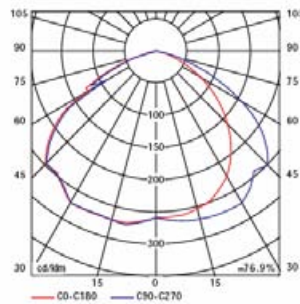
### Dimensions



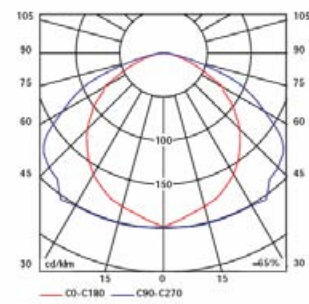
### Photometrics



100W

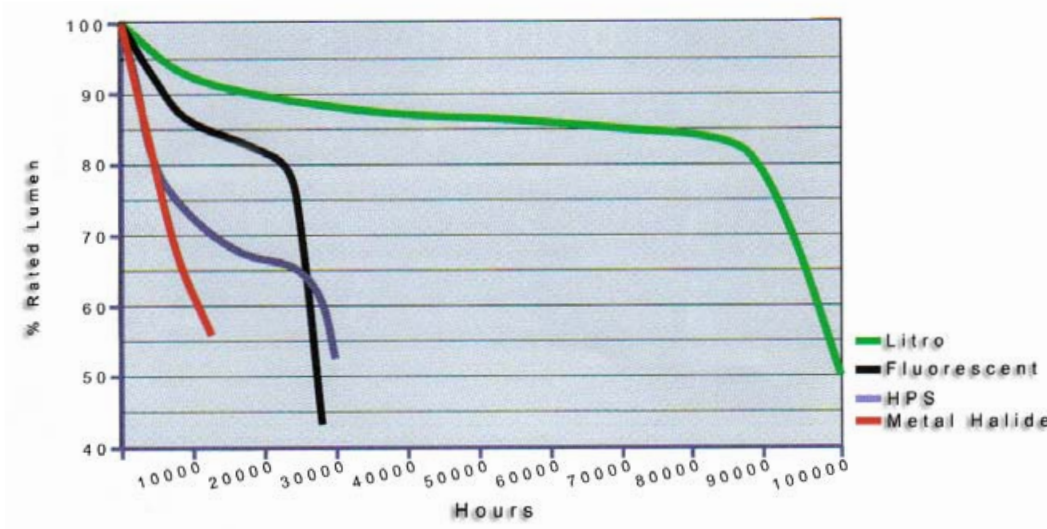


200W



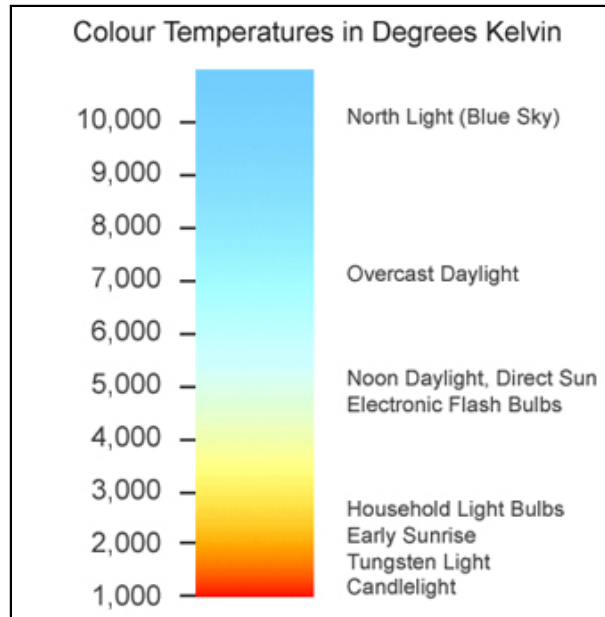
400W

# GREENSTAR LIGHTING SOLUTIONS



## Kelvin

A unit of measure to describe the color temperature of lamps. Low temperatures refer to lamps with a large red component which generally creates a feeling of warmth. High temperatures refer to lamps which generally contain more blue and the space will appear visually cooler. Litro Lighting has a Kelvin rating of 5000.ccc



?

?

?

?

?

?

# GREENSTAR LIGHTING SOLUTIONS

---

## Litro Glo 5000

---



### All bulbs can be implemented with LitroGlo 5000 effect!

LitroGlo 5000 combines a high-spectrum, scotopic-rich phosphor blend with a strontium aluminate (non-radioactive) after-glow phosphor blend in a discharge fluorescent tube. LitroGlo 5000 bulbs have been designed to maximize and compliment the eye's ability to see under low light conditions.

The combination of this scotopic-rich phosphor blend and the afterglow phosphor blend compliment each other in many ways: visual acuity, scotopic eye response, high-spectrum color correctness, melatonin reduction, energy efficiency, and quicker emergency response time in low light levels.

The LitroGlo 5000 afterglow phosphors are fully charged in just 15 minutes and partially charged immediately when turned on. The afterglow light output will continue for a period of time after power is cut off, approximately 1 hour of high intensity glow and up to 12 hours of lower glow.