



solar LED area lighting:
an empowering experience



When remarkable freedom and exceptional performance meet, an empowering experience begins.

Imagine being free of the electrical grid. Imagine exceptionally reliable performance. Imagine innovative and nimble technology that responds to its environment. Versatile, adaptable and resilient: Carmanah solar area lighting solutions are boldly turning yesterday's imagination into today's reality.




**A brilliant idea:
area lighting with no
strings attached.**

Cut the ties that bind area lighting solutions to the electrical grid; break free of ongoing electrical bills and maintenance schedules. The exceptional technology from two industry leaders creates the first premium quality solar LED area lighting solution.

Using Carmanah solar power solutions and BetaLED™ THE EDGE™ luminaires, area lighting is finally liberated from the limits of trenching, the cost of electrical contractors and the uncertainty of electrical grid performance.

Surprisingly easy to install and flawlessly reliable under even the most demanding conditions, solar area lighting solutions are simply an intelligent choice.

- No trenching, cabling or wiring
- No electrical contractors or technicians required for installation
- Robust design equipped to handle heavy wind loads and temperature extremes
- No scheduled maintenance for up to five years
- Extended luminaire life, up to 60,000 hours, means reduced maintenance costs and total cost of ownership
- No electrical bills



Experience the revolution: the first premium quality solar LED area lighting solution

The Environmentally Friendly Solution

Eco-friendly lighting solutions are a savvy decision that can put dollars back into an agency's pocket. Not only does solar area lighting save on energy bills and maintenance costs, it reduces greenhouse gas emissions. In addition, BetaLED THE EDGE luminaires contain no mercury and last five times longer than metal halide, resulting in less environmental waste. This integrated solar area lighting solution can qualify a business for LEED Renewable Energy credits. Contact Carmanah today to find out how LEED credits could apply to your solar area lighting application.

Equipped with Carmanah's proprietary MICROSOURCE® energy management system (EMS), Carmanah solar solutions are designed to perform in the world's most demanding conditions.

At the forefront of solar innovation, the three main components of the Carmanah MICROSOURCE energy management system create a dynamically responsive technology that allows a level of control unlike anything else on the market.

Automatic Light Control

Automatic Light Control is what makes Carmanah solar technology nimble. Using a sophisticated algorithm, the unit recognizes trends in available light and dynamically adjusts the relationship between light output and available energy resources. This is just one of the features that allow Carmanah solar area lighting systems to offer unmatched robustness and reliability.

Power Management

Responsible for the low maintenance, flawless performance and rugged reliability of Carmanah solar area lighting, power management is the cornerstone of MICROSOURCE EMS technology. Monitoring and optimizing battery charge levels, power management technology ensures that energy reserves are always at their peak. It also protects performance integrity by preventing damaging deep cycling during periods of low solar levels.

Independent Light Output

The Carmanah MICROSOURCE EMS allows THE EDGE LED (light emitting diodes) luminaires from BetaLED to deliver a constant drive level that is independent of the battery system; this independent light output ensures the vibrancy of Carmanah solar area lighting systems. Configured for the exact product and components being used, independent light output allows for precise control of brightness levels and power consumption.



The self-contained EverGEN solar engine integrates all components within a compact and durable pole-mounted design.

THE EDGE LED luminaires offer more lumens per watt, excellent uniformity and its modular design is built for durability.



Contemporary design, robust construction and resilient performance:

Carmanah Takes Solar Solutions to New Heights

A sleek, self-contained solar engine design houses all components in one compact unit.

Carmanah energy management system incorporates patented MICROSOURCE technology.

A secure enclosure protects against theft and vandalism.

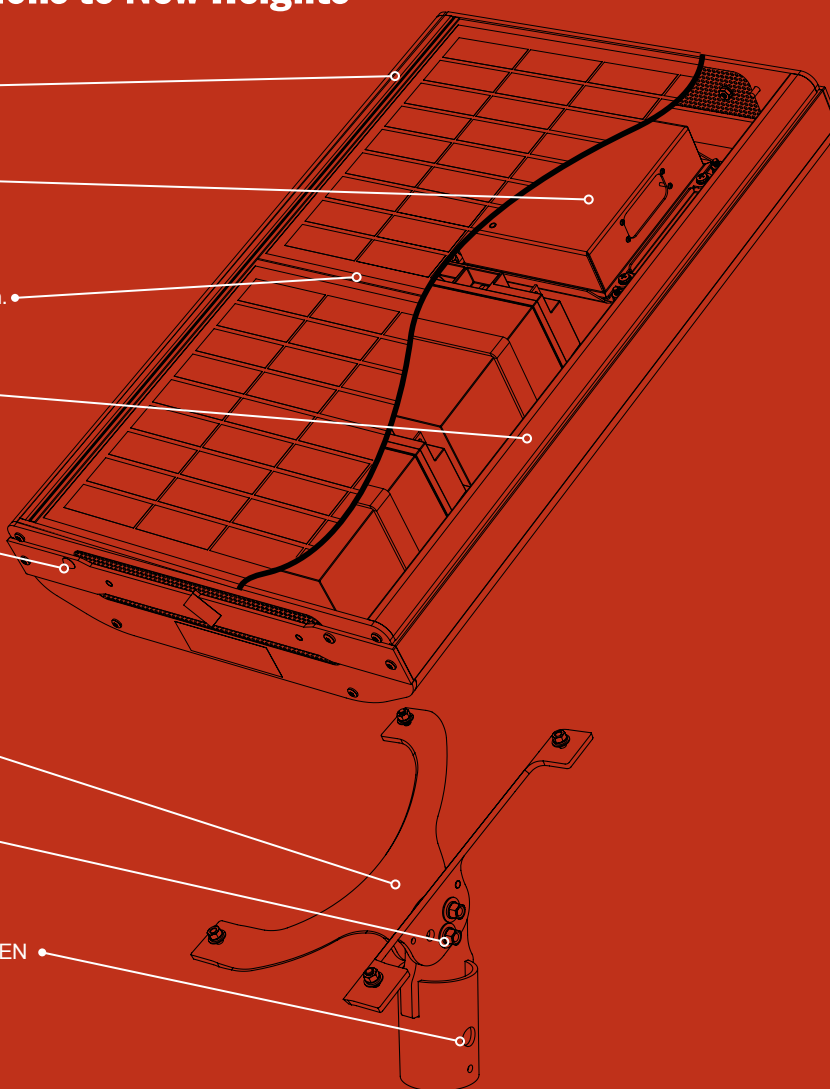
Designed to endure; staunch framework withstands extreme wind loads.

A pivoting top opens to provide easy access to unit compartments.

The durable finish prevents corrosion and damage from the elements.

With variable tilt angle from zero to 60°, the Carmanah EverGEN solar engine can be configured to optimize sun exposure.

Featuring simple pole-top installation, Carmanah EverGEN 10, 20 & 30 W solar engines slip fit onto a 3" diameter round pole. Carmanah 50 & 80 W solar engines mount easily to the side of a 3.5" or 4" diameter round pole.



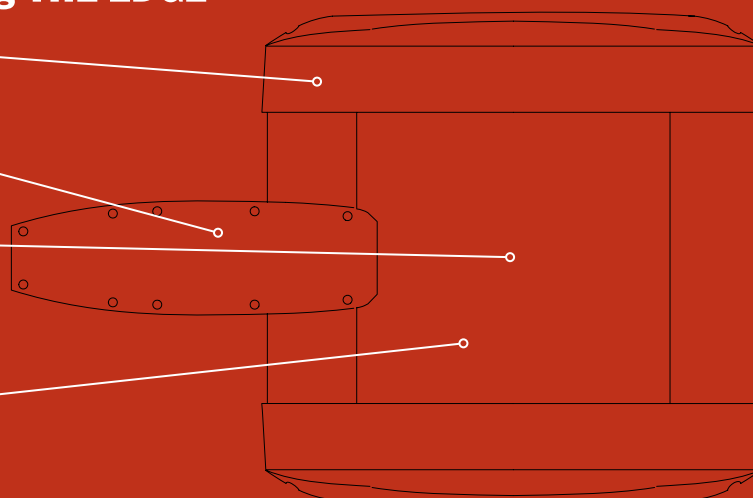
BetaLED Gives Solar Lighting THE EDGE

Meets IES full cut-off standards and International Dark-Sky Association guidelines.

Luminaires feature a direct light bar design and IP-65 rated wiring component.

Maximizing LED advantages, THE EDGE fixtures feature sleek, rugged housings made of low copper content die cast aluminum with Colorfast DeltaGuard™ finish.

THE EDGE signature top screen, designed to minimize debris build-up on the heat sinks, allows for self-cleaning of the entire unit.



THE EDGE LED luminaires from BetaLED

Expert lighting system designer and manufacturer, BetaLED, expands THE EDGE family of products with its latest fixture, designed specifically to work in harmony with Carmanah's proven EverGEN solar engine and energy management technology. Achieving maximum performance and efficiency using standard IES Type II short, Type II long, Type III and Type V distributions, this revolutionary solar area lighting innovation delivers unprecedented optic distribution and uniformity, which further translates into fewer, further spaced poles.

THE EDGE line of LED luminaires sets new standards for performance and efficiency. Balancing form and function, THE EDGE offers more lumens per watt and its modular design is built for durability. With extraordinary heat dissipation qualities and exclusive NanoOptic™ technology that virtually eliminates reflective or refractive losses, THE EDGE luminaire is a natural partner for Carmanah solar technology.

Exclusive BetaLED NanoOptic Provides Superior Light Control

THE EDGE uses a direct-contact refractor optic called NanoOptic, which sits on the LED to provide maximum light output and optimal light control. NanoOptic refractors are made of UV-stabilized High Intensity Discharge (HID) acrylic that is formulated on the basis of decades of field experience with the material. The NanoOptic refractor minimizes all losses and creates efficiencies much greater than traditional reflectors—up to and exceeding 96%.



Operating Profile

The Carmanah solar area lighting system features an intelligent operating profile for the luminaire, and can be configured to provide illumination during times of peak usage. Three types of operating profiles are available:

Split Night:

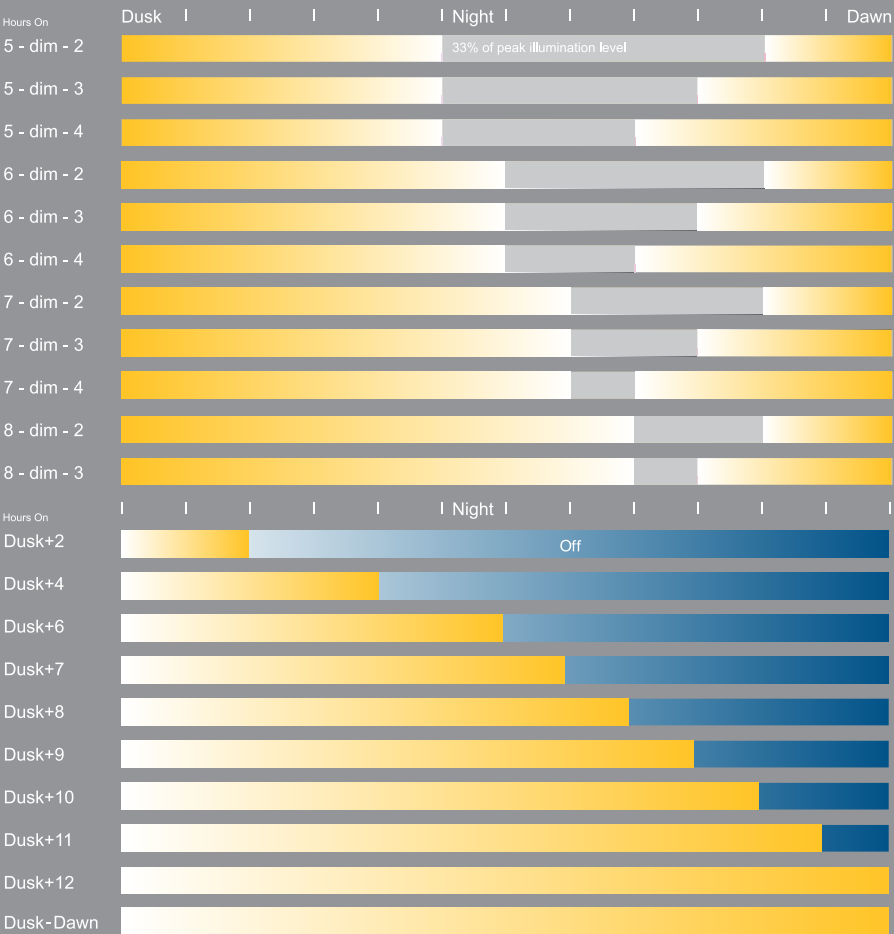
The luminaire turns on at dusk at full intensity for a fixed number of hours, the intensity is then reduced to 33% of full intensity for a portion of the night, and then the luminaire returns to full intensity for a fixed number of hours before dawn. This is an excellent option to maximize light output when needed most, while still providing lighting throughout the night.

Fixed Night:

The luminaire turns on at dusk for a fixed number of hours and then turns off.

All Night:

The luminaire remains on from dusk to dawn at a constant light intensity.



LEDs: the revolution in lighting technology



THE EDGE fixtures utilize high-performance, super-bright white LEDs. These current class-leading performance LEDs exceed 80 lumens per watt at 6000K color temperature, and are resistant to extreme environments and changes in ambient temperatures. LED light sources are the most progressive choice an agency can make, offering several benefits over standard HID light sources:

Dependable performance: As a solid state light source, LEDs are ruggedly shock and vibration resistant, and resilient to extreme temperatures.

Superior lumen maintenance: White LEDs feature excellent lumen maintenance over the life of the product, providing superior lumen maintenance, up to 60,000 hours of operation to 85% lumen maintenance, compared to HID light sources.

Exceptional heat dissipation qualities: All new design ensures proper heat management, effectively increasing luminaire longevity.

Optimum color temperature: Operating at 6000K, LEDs provide strikingly crisp illumination.

Enhanced light uniformity: Eliminates hot spots and minimizes eye adjustments when moving between dark and light areas.

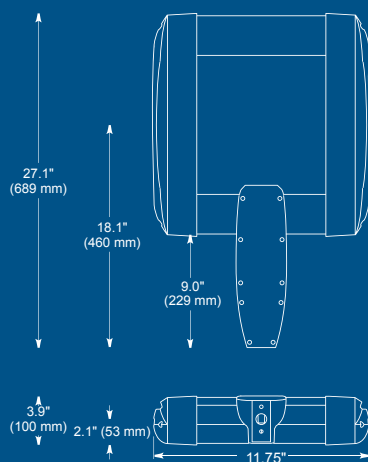
Instant, bright illumination: LED light sources require no warm-up time and provide instant re-strike.

Directional light source: Remarkably simple in design, LED lighting requires no reflectors, increasing efficiency and flexibility, and eliminating the challenges associated with dirt depreciation.

THE EDGE complies with IES full cutoff standards and International Dark-Sky Association guidelines, which encourage darker skies through lighting that creates less skyglow.

DIMENSIONS

THE EDGE LED Luminaire



SPECIFICATIONS

AREA LIGHTING

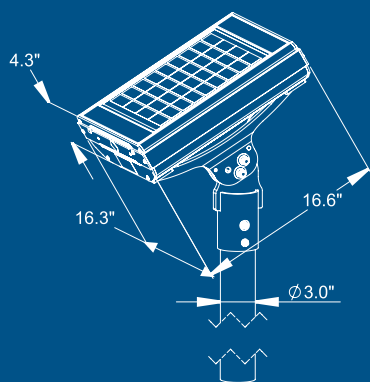
Illumination technology	Single light bar, 20 high-intensity light emitting diodes (LEDs) with NanoOptic secondary optics
Photometric options	IESNA Type II Short, Type II Long, Type III, Type V
Output color	6000K
Minimum color rendering index (CRI)	75
Remote mounting	up to 100' from solar engine (using 10 gauge wire - not supplied)

CONSTRUCTION

Housing	Die-cast aluminum
Finish	Colorfast DeltaGuard finish
Hardware	Corrosion resistant
EPA	0.60 sq ft
Weight	Approx. 20 lb (9.07 kg)
Mounting	Direct mount
Ingress protection	IP 65 per IEC 529
Color	White

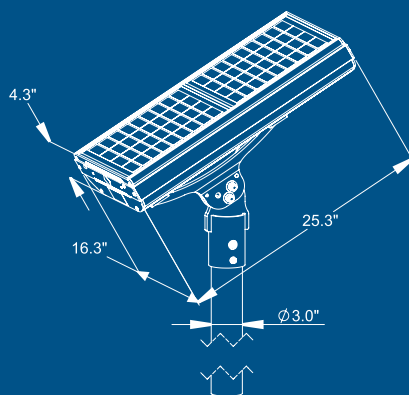
DIMENSIONS

EverGEN SE-10



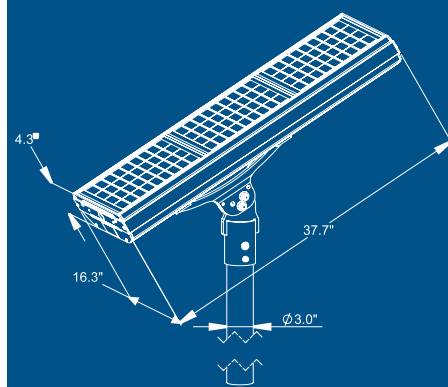
DIMENSIONS

EverGEN SE-20



DIMENSIONS

EverGEN SE-30



EVERGEN SE-10

Mechanical

Housing	Corrosion resistant aluminum
Support bracket	Hardened steel
Hardware	Stainless steel
Mounting angles	0°, 15°, 30°, 45°, 60°
Effective projected area*	1.67 ft ² (0.16 m ²)
Weight	41 lb (19 kg)
Pole diameter (Pole not Included)	3 in (7.62 cm)

Energy Management System

Operating profile	Configurable (see operating profiles)
Power management	MICROSOURCE® code suite

EVERGEN SE-20

Mechanical

Housing	Corrosion resistant aluminum
Support bracket	Hardened steel
Hardware	Stainless steel
Mounting angles	0°, 15°, 30°, 45°, 60°
Effective projected area*	2.5 ft ² (0.23 m ²)
Weight	62 lb (28 kg)
Pole diameter (Pole not Included)	3 in (7.62 cm)

Energy Management System

Operating profile	Configurable (see operating profiles)
Power management	MICROSOURCE® code suite

EVERGEN SE-30

Mechanical

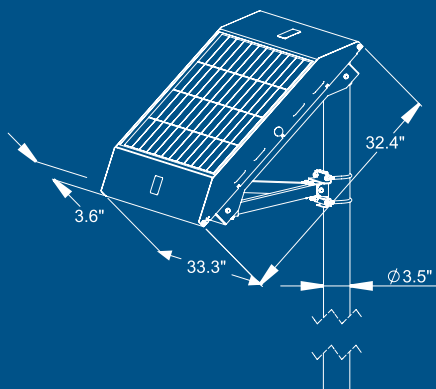
Housing	Corrosion resistant aluminum
Support bracket	Hardened steel
Hardware	Stainless steel
Mounting angles	0°, 15°, 30°, 45°, 60°
Effective projected area*	3.72 ft ² (0.35 m ²)
Weight	84 lb (38 kg)
Pole diameter (Pole not Included)	3 in (7.62 cm)

Energy Management System

Operating profile	Configurable (see operating profiles)
Power management	MICROSOURCE® code suite

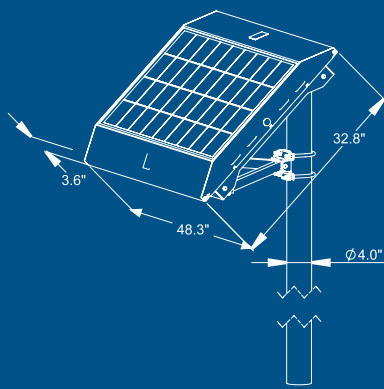
DIMENSIONS

EVERGEN SE-50



DIMENSIONS

EVERGEN SE-80



EVERGEN SE-50

Mechanical

Housing	Corrosion resistant aluminum
Support bracket	Hardened steel
Hardware	Stainless steel
Mounting angles	45°
Effective projected area*	5.28 ft ² (0.49 m ²)
Weight	121 lb (55 kg)
Pole diameter (Pole not Included)	3.5 in (8.75 cm) or 4.0 in (10 cm)

Energy Management System

Operating profile	Configurable (see operating profiles)
Power management	MICROSOURCE® code suite

EVERGEN SE-80

Mechanical

Housing	Corrosion resistant aluminum
Support bracket	Hardened steel
Hardware	Stainless steel
Mounting angles	45°
Effective projected area*	7.78 ft ² (0.72 m ²)
Weight	177 lb (80 kg)
Pole diameter (Pole not Included)	3.5 in (8.75 cm) or 4.0 in (10 cm)

Energy Management System

Operating profile	Configurable (see operating profiles)
Power management	MICROSOURCE® code suite

COMMON SPECIFICATIONS

Environmental

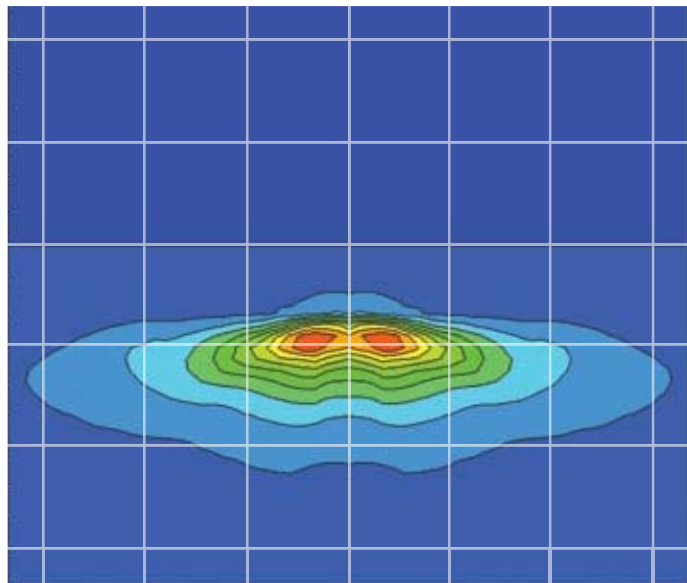
Ambient operating temperature range	Standard: 23 to 95 °F (-5 to 35 °C)
	Extended: -4 to 122 °F (-20 to 50 °C)
Wind load	Steady wind speed not to exceed 110 mph (177 km/h)
Shock	10 g's
Vibration	1 Hz, 12" amplitude, 20 years
Other	Direct sunlight required

* EPA measured at steepest mounting angle

Photometric Plot

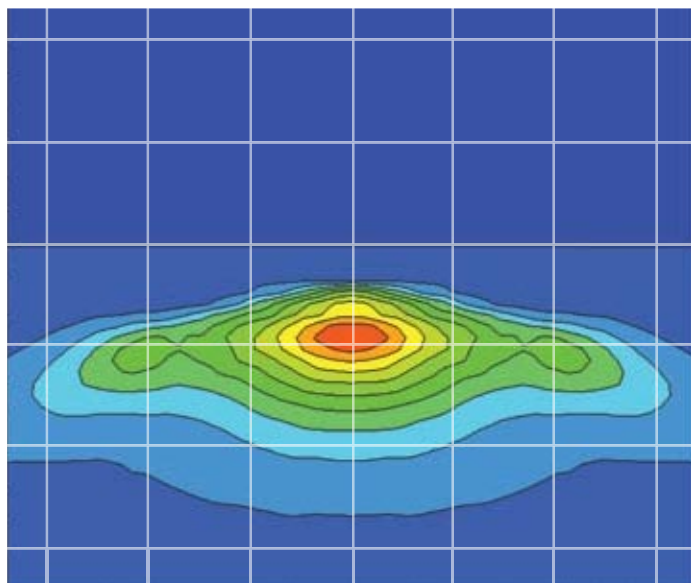
Photometric plots are based on a 15' mounting height at light level 5.
Use the mounting height and light level multiplier tables on page 11 to adjust footcandles (fc) values.

Type II Short



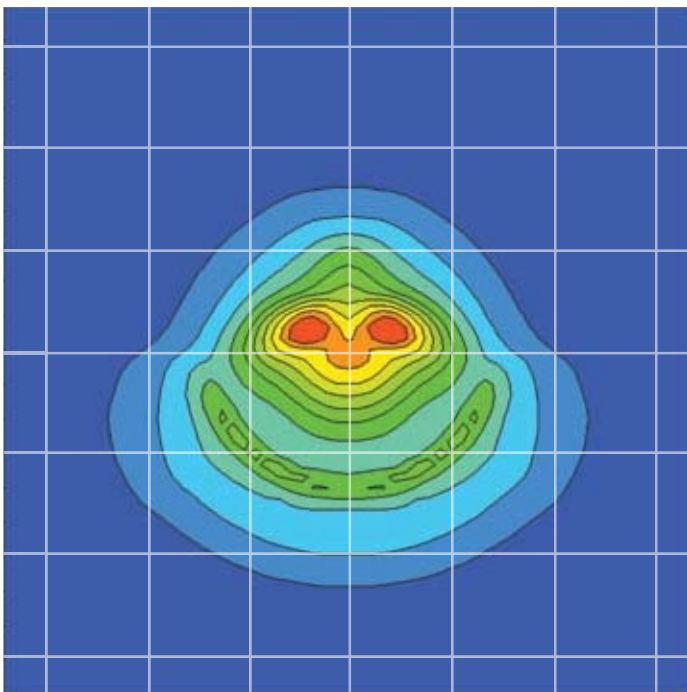
6.89 6.20 5.51 4.82 4.13 3.44 2.75 2.07 1.38 0.69 0.00

Type II Long



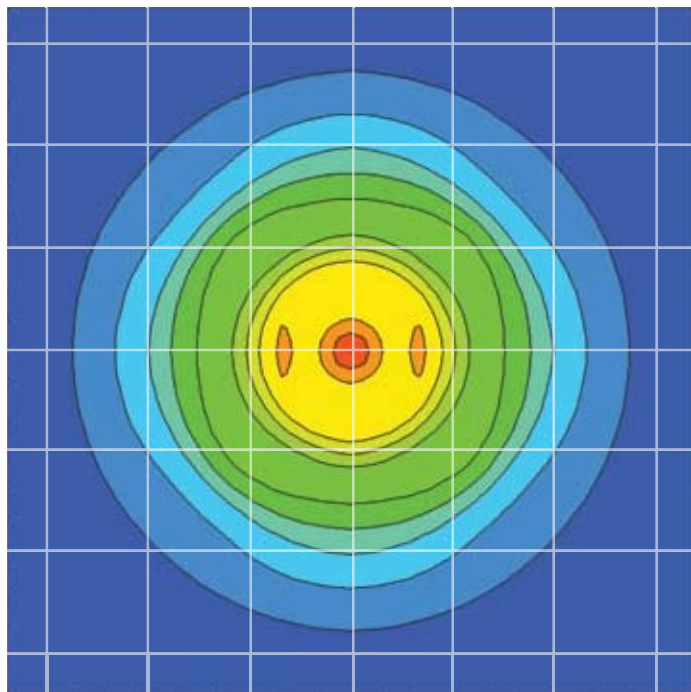
4.23 3.80 3.38 2.96 2.54 2.11 1.69 1.27 0.85 0.42 0.00

Type III



1.18 1.07 0.97 0.86 0.75 0.64 0.54 0.43 0.32 0.21 0.11 0.00

Type V



0.653 0.594 0.535 0.476 0.417 0.358 0.299 0.240 0.181 0.122 0.063 0.004

One grid space = one mounting height (1 MH).

All value are shown in footcandles. To convert from footcandles to lux multiply values by 10.76.

System Selection

Directions:

- 1) Select light distribution from photometric plots on page 10.
- 2) Adjust fc values on the photometric plots for desired mounting height using the mounting height multiplier table.
- 3) Adjust fc values from step 2 for the desired light level using the light level multiplier table.
- 4) Select the required solar engine size for the location and operating profile from the system selection table.

Example: To obtain peak footcandles for a Type II Long at 18' mounting height, at light level 2 in Los Angeles:

- $4.23 \times 0.7 \times 0.37 = 1.096 \text{ fc}$
- For installation in Los Angeles, the EverGEN SE-30 is required for a light level 2 using the 5 – Dim – 2 or Dark + 6 operating profile; or, the EverGEN SE-50 is required for the Dusk-Dawn operating profile (see page 6 for operating profile details).

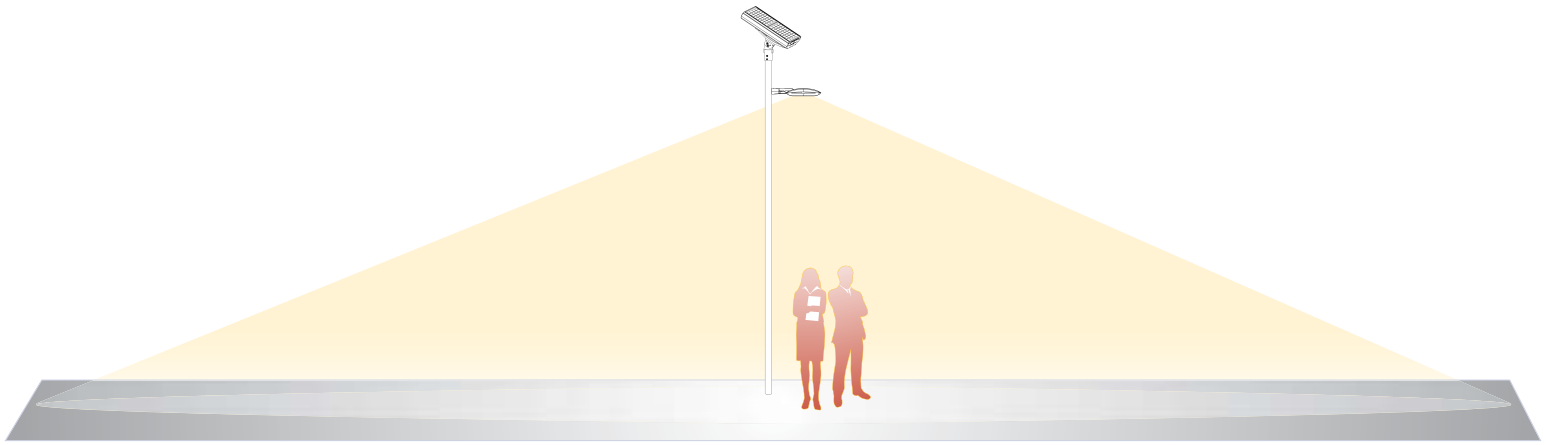
If your desired location is not listed, or another operating profile is required, please contact your Carmanah representative.

Mounting Height		Multiplier
3m	9.8'	2.3
3.5m	11.5'	1.6
4m	13.1'	1.3
4.5m	15'	1.0
5m	16.4'	0.8
5.5m	18'	0.7
6m	19.7'	0.6

Light Level	Multiplier
1	0.13
2	0.37
3	0.53
4	0.70
5	1.00

Light Level Chart

		Solar Engine Size														
		EverGEN-10	EverGEN-20	EverGEN-30	EverGEN-50	EverGEN-80	EverGEN-10	EverGEN-20	EverGEN-30	EverGEN-50	EverGEN-80	EverGEN-10	EverGEN-20	EverGEN-30	EverGEN-50	EverGEN-80
Operating Profile		5 - Dim - 2					Dusk +6					Dusk - Dawn				
North America	Atlanta	-	1	1	2	3	-	1	2	2	4	-	-	1	1	2
	Chicago	-	1	1	1	2	-	1	1	1	2	-	-	-	1	1
	Dallas	-	1	1	3	4	-	1	2	3	4	-	-	1	1	2
	Denver	-	1	1	1	2	-	1	2	2	3	-	-	1	1	1
	Los Angeles	1	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	New York	-	1	1	2	3	-	1	1	2	4	-	-	1	1	1
	Orlando	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Phoenix	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	San Francisco	-	1	1	2	3	1	1	2	3	4	-	-	1	1	2
	Seattle	-	-	1	1	2	-	1	1	2	3	-	-	-	1	1
	Toronto	-	-	1	1	2	-	1	1	1	3	-	-	-	1	1
	Nassau	1	1	2	4	5	1	2	3	4	5	-	1	1	2	3
	Mexico City	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Miami	1	1	2	4	4	1	2	2	4	5	-	1	1	2	3
Operating Profile		5 - Dim - 2					Dusk +6					Dusk - Dawn				
Central & South America	Caracas	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Rio	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Lima	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Santiago	-	1	1	3	4	1	1	2	3	4	-	-	1	1	2
	Buenos Aires	-	1	1	3	4	1	1	2	3	4	-	-	1	1	2
Operating Profile		5 - Dim - 2					Dusk +6					Dusk - Dawn				
Europe, Africa & Middle East	London	-	-	-	1	1	-	-	1	1	2	-	-	-	-	1
	Paris	-	-	-	1	1	-	-	1	1	2	-	-	-	-	1
	Madrid	-	1	1	2	3	-	1	1	3	4	-	-	1	1	2
	Berlin	-	-	-	1	1	-	-	1	1	2	-	-	-	-	1
	Baghdad	-	1	1	3	4	1	1	2	4	4	-	1	1	1	2
	Abhu Dhabi	1	1	2	4	5	1	2	3	4	5	-	1	1	2	3
	Casablanca	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Lagos	-	1	1	2	3	-	1	1	3	4	-	-	1	1	2
	Cape Town	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
Operating Profile		5 - Dim - 2					Dusk +6					Dusk - Dawn				
South East Asia & Pacific	Singapore	-	1	1	2	3	-	1	1	3	4	-	-	1	1	2
	Taipei	-	1	1	2	3	-	1	1	2	4	-	-	1	1	2
	Tokyo	-	1	1	2	4	1	1	2	3	4	-	1	1	1	2
	Sydney	-	1	2	3	4	1	1	2	4	5	-	1	1	2	3
	Melbourne	-	1	1	2	3	-	1	1	3	4	-	-	1	1	2
	Auckland	-	1	1	3	4	1	1	2	4	4	-	-	1	1	2



About Carmanah Technologies Corporation

As one of most trusted names in solar technology, Carmanah has earned a reputation for delivering strong and effective products for industrial applications worldwide. Industry proven to perform reliably in some of the world's harshest environments, Carmanah's lights and power systems provide a durable, dependable and cost effective energy alternative.

For more information on Carmanah solar lighting technology, visit carmanahlighting.com.



About BetaLED

BetaLED, a brand of Beta Lighting, was established to dedicate resources to the emerging use of LED technology for general illumination. Beta Lighting, a Ruud Lighting company, provides the lighting industry with high quality, specification-grade luminaires for exterior lighting applications.

Headquartered in Racine, Wis., Ruud Lighting operates a 450,000-square-foot manufacturing facility and is ISO90001:2000 registered.

For additional exterior LED luminaire information, visit www.BetaLED.com.

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Specifications may be subject to change.

Carmanah Technologies Corporation assumes no liability for third-party products and services used in the installation of this product and work performed by third-party service providers. Purchasers are advised that the security and strength of any product installation will be dependent upon the type of pole on which the product is mounted, the footing, the fasteners and materials in fixing the product to the pole and site conditions.

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