LumiLock™ with GX1™ LED
and Refractive Technology

PHILIPS
HADCO
sense and simplicity

Hadco, Leadership in LED...

Hadco manufactures most of our post-top luminaires around LumiLock™, an integral ballast/socket/light engine module. Now, with LED, Hadco has created an excellent, sustainable solution for your outdoor lighting needs. Using LumiLock™, you can upgrade existing refractive luminaires to LED, energy saving technology.

Reasons for LED:

- *energy savings*
- *lower cost of ownership*
- *sustainability*
- *5 year extended warranty**

Why Hadco LumiLock™ LED?

- *complete system*
- *Fentress Refractive Series*
- *simple retrofit solution*

Hadco is a Philips group brand and has been a leader in manufacturing high-performance, exceptional quality lighting products for over 50 years.

Hadco serves the Municipal/Utility, Commercial and Residential lighting markets. Our lean, made-to-order philosophy and commitment to providing the lighting industry's shortest lead times allows us to consistently meet our customers' needs. Hadco specializes in custom and modified products and utilizes the latest technologies available.

All products are manufactured to ISO 9001:2000 standards.

** reference Hadco website for complete warranty information.*

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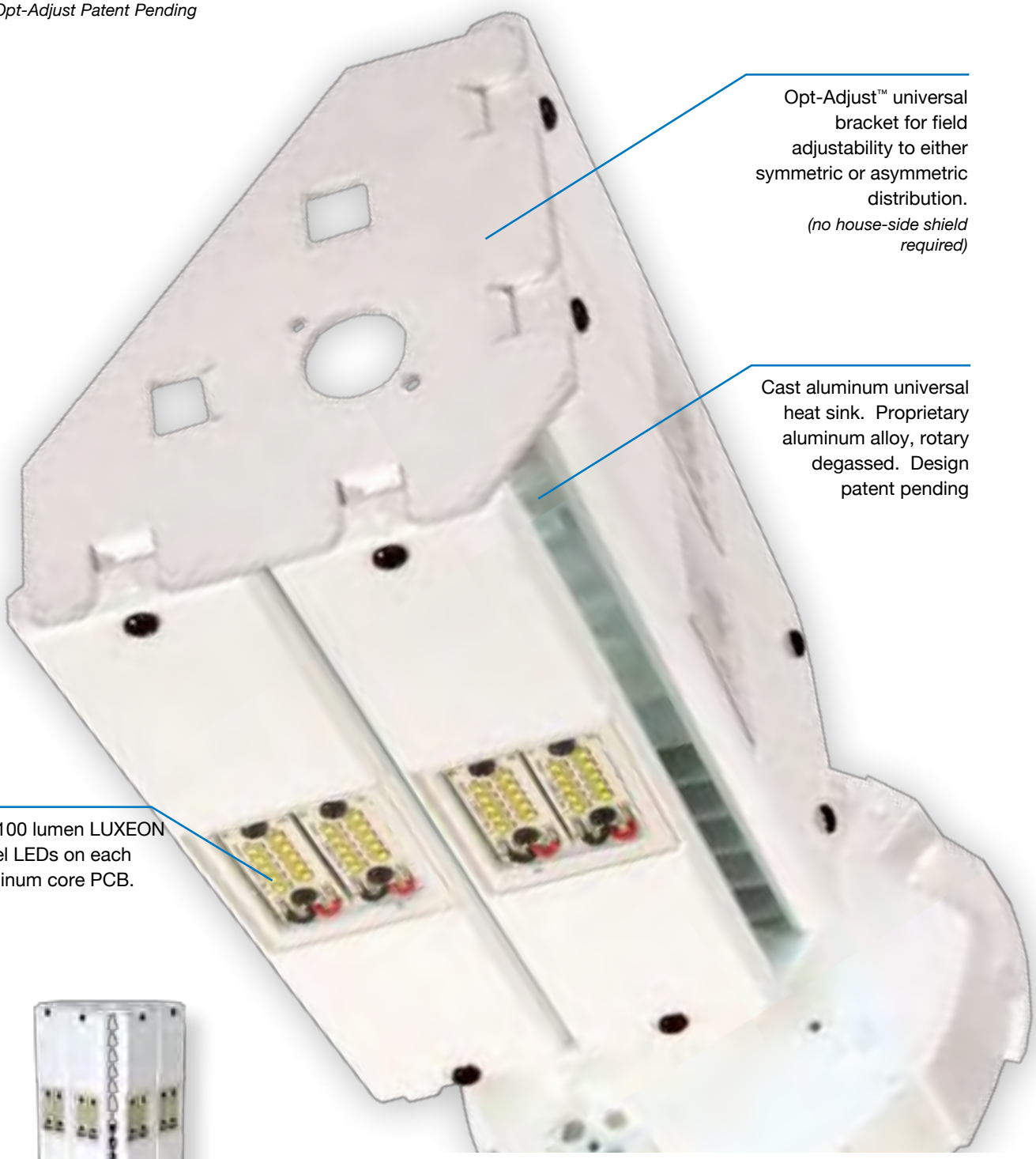
LumiLock™ GX1 LED and Opt-Adjust™ System

** Opt-Adjust Patent Pending*



Asymmetric

An asymmetric distribution pattern creates a footprint of light which is predominantly focused on one side of the luminaire. This type of illumination is perfect for roadway and path applications where a high level of light behind the luminaire is not required or desired. In short, an asymmetric pattern puts light where it's wanted.

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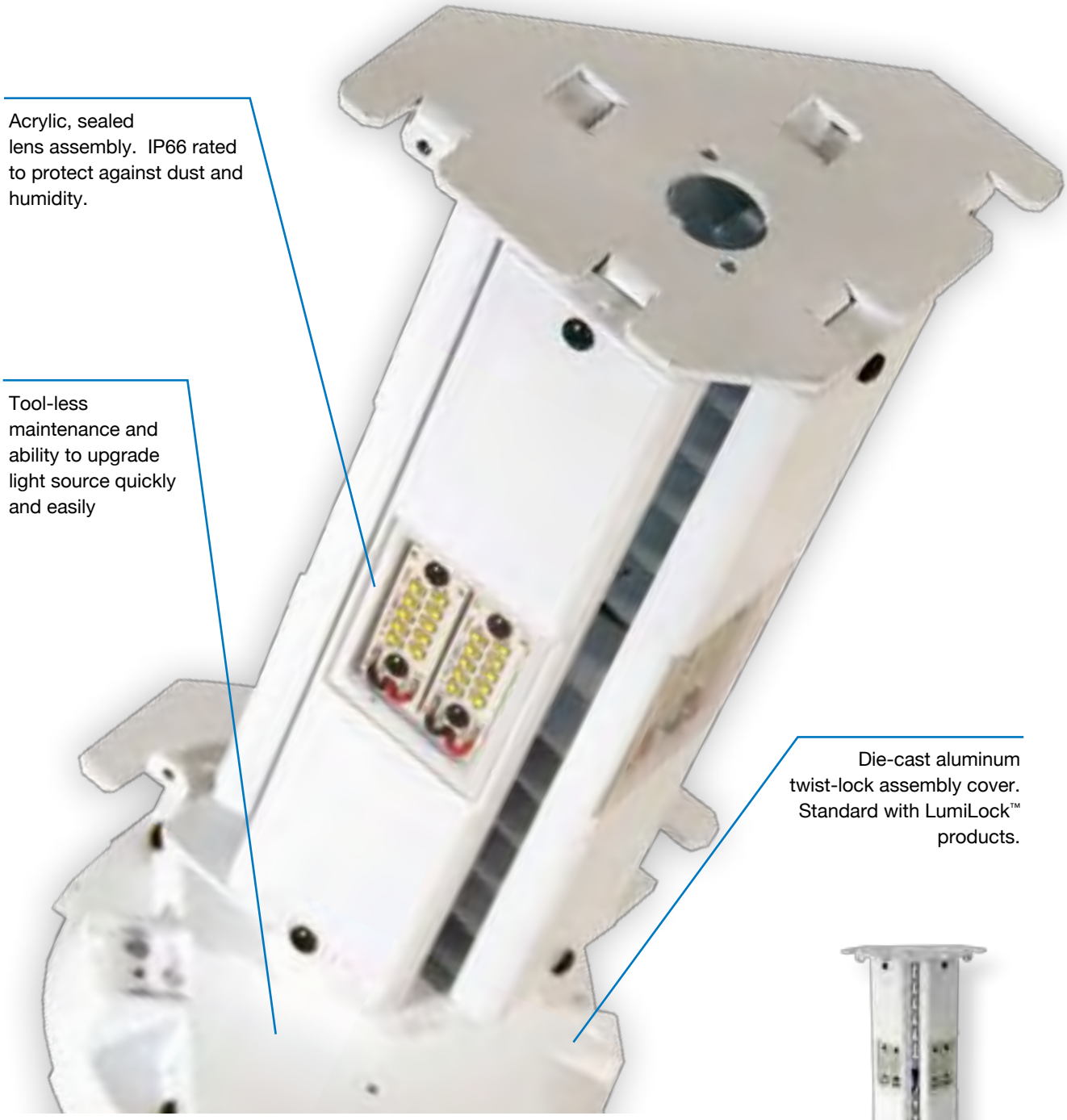


Symmetric

A symmetric distribution pattern creates an even level of light around the entire perimeter of the luminaire. This type of even illumination is ideal for open areas such as parks, college campuses and parking lots.

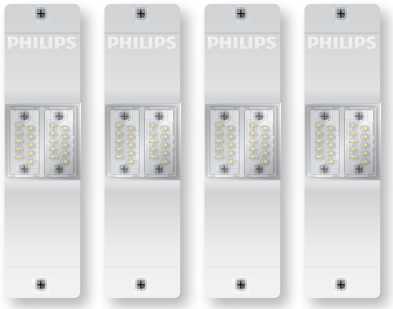
Design for LED Luminaires is Critical

Hadco designs for longevity with state-of-the-art software and technologies. Every product is designed and tested first with 3-dimensional software to ensure that the LED manufacturer's specifications will be met prior to tooling up for production. Not only does this improve speed-to-market, but it also allows engineers to create optimal designs for thermal management which is critical to the life of LEDs.

A simple retrofit "solution" can quickly become more of a problem than a solution unless it is designed properly. Validation of the entire luminaire system design is critical to ensure that the LED manufacturer's junction temperature limit is not exceeded.

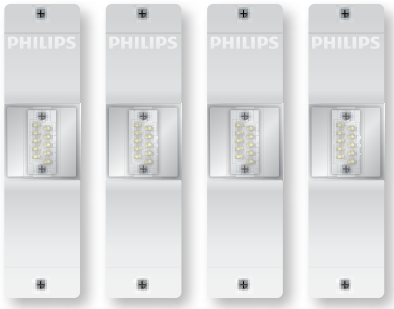
Without proper thermal management, the promises of a long lifespan and delivered lumens from an LED luminaire cannot be achieved and pre-mature failure is eminent. LumiLock™ with LED addresses these issues with innovative heat sinking and thermal management, designs that have been thoroughly tested ensuring the most reliable LED luminaire system available.

LumiLock™ GX1 LED Specifications



Higher Output (80 LEDs)

Approximately 100 watts power consumption.
Maximum input current draw 2A.



Lower Output (40 LEDs)

Approximately 50 watts power consumption.
Maximum input current draw 1A.

- (10) 100 lumen LUXEON Rebel LEDs on each aluminum core PCB..
- Patent pending, cast aluminum heat sink design.
- Sealed, acrylic lens; IP66 rated.
- Symmetric & asymmetric distribution patterns *(field adjustable)*.
- 3000K, 4000K color temperature *(CCT)*.
- Min. 70 color rendering index *(CRI)*.
- Approximately 60,000* hours of operational life.
- Operating temperature range: -40°C to +50°C.
- Smart Select™ electronic driver 120 - 277 VAC; 50 - 60 Hz; auto-sensing.
- ETL and cETL listed.
- 5 year extended warranty.
- 6KV surge protection.

** at 25°C ambient temperature and 70% lumen maintenance.*

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Simple Retrofit and Upgrade Installation

Upgrading a luminaire from a traditional lamp source to LED doesn't have to mean a replacement of an entire luminaire. Hadco's LumiLock™ provides a quick retrofit solution.

Just twist out the existing LumiLock™ assembly and replace it with the GX1 LED system. That's it. Quick-disconnects on wire assemblies help simplify the replacement process.

Asymmetric or Symmetric?

When you have the GX1 LED, you have both.

The patent-pending design of the Opt-Adjust™ system offers the ultimate in versatility. With this design one GX1 LED system can be quickly converted from symmetric to asymmetric distribution or vice-versa. Simply remove four screws, move two LED bars to the open locations and replace the screws. Tabs lock the light bars at their proper position to ensure optimum optical performance.

For more detailed information, download the instruction sheet from www.hadco.com.

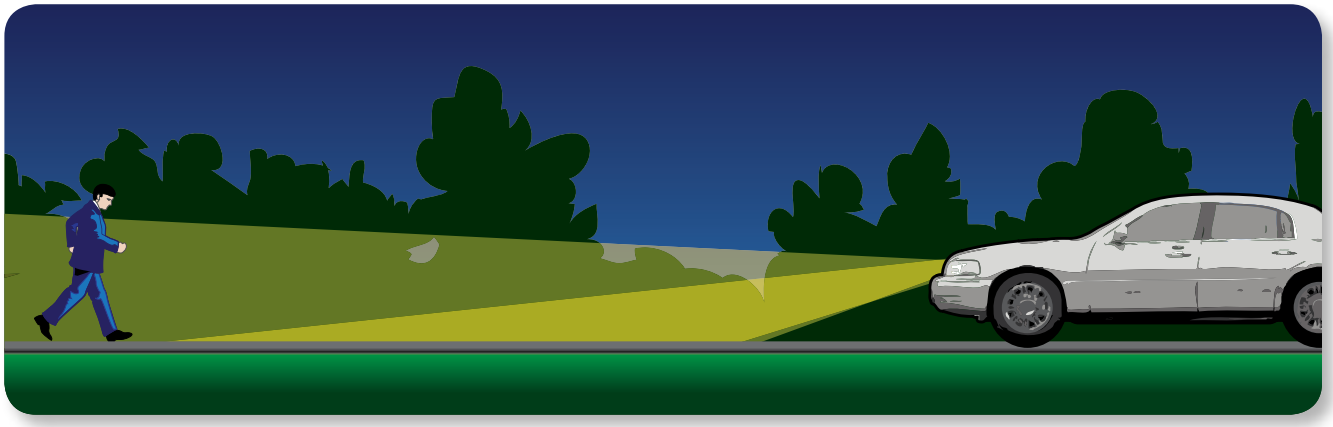
Refractive Globe Technologies

Hadco's superior refractive optics are designed to bend the light from the source and direct it out and down at precise angles for optimal efficiency. In addition, Hadco's refractive technology incorporates glare control into the design and masks the individual LED components so that there are no visible "dots." The result is a solid-state light source which resembles the aesthetic appeal of traditional lamp sources.

LumiLock™ with LED incorporates the ability to reduce house side illumination without the need for an auxilliary reflector. Patent-pending, adjustable light bars allow for redirection of the light so that it is not wasted.

The performance of the Hadco refractive technology also boasts an industry leading 10:1 mounting height to spacing ratio. Couple that with four times the vertical illuminance of a standard cobra-head and the end result is a reduction in the number of luminaires and poles required to complete the job, saving energy and reducing the cost of materials, installation and maintenance.

Safety is a major concern in many communities and is an important factor in the consideration of luminaire selection. Since Hadco's refractive technology bends the light at proper angles to illuminate vertical surfaces, dark areas are eliminated and the safety of motorists and pedestrians is improved. Compared to higher mounted luminaires, Hadco's refractive luminaires are typically installed at about fourteen feet. This allows the luminaire to remain underneath tree canopies so that shadows and hazardous areas are not created.



The vertical illuminance produced by the car's headlights illuminate an oncoming pedestrian in the same manner a Hadco refractive globe does.

Overhead fixtures project most of their light downward, creating shadows, silhouettes, and hot spots.

With lower mounting heights, Hadco's Refractive Globes light horizontally, beneath the tree canopy. They create an overlapping pattern of light, leaving no light gaps, and reducing shadow areas.

Benefits

Energy Savings

Saving energy is an important factor to many communities and decision-makers. LED lighting offers the highest energy savings of any lighting source on the market. As a comparison to high-intensity discharge *(HID)* lamps, LED luminaires can save as much as 50-70% energy use.

"According to the U.S. Dept of Energy, no other lighting technology offers the same potential as LEDs to save energy and enhance lighting quality and reliability."
(Architectural SSL; p.37; November 2008)

Low Maintenance

A major factor in the total cost of ownership *(TCO)* of luminaires is the maintenance cost. LEDs can last for over 15 years *(at least 70,000 hours at 70% lumen maintenance)* compared to HID which has a significantly shorter lifespan, therefore a maintenance crew must be sent to re-lamp the HID luminaires as many as three times before a properly designed LED system needs to be replaced.

"With a 10- to 15-year lifetime that is at least triple that of current technologies, the maintenance advantages alone offer a street-smart argument for transitioning to LED-based systems."
(Philips; White Paper: Street Lighting)

Green

What does Green really mean? Many think of it in terms of the degree to which we are preserving our planet. One way to accomplish this is to reduce our "carbon footprint". The carbon footprint is thought of as the amount of carbon dioxide *(CO_2)* and greenhouse gasses released into the atmosphere by human activity or a product lifecycle. By switching to LED, the amount of CO_2 emitted by luminaires is drastically reduced. In addition, since LEDs are mercury-free and contain no hazardous materials they are environmentally safe and recyclable.

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The Fentress Refractive Series: CL32/CL52

Ordering Example: CL32 R D K N 2 A N 3K L30 C1

GLOBE	POD	ROOF	CAGE	BRIM	FASTENER
CL32 Acrylic Type III Narrow	* M	D	K		2
CL52 Acrylic Type V Narrow	R	H	L	* A	Allen head set screws for post fitter and globe holder.
	* P	J	N None	N None	
		K			
	** Fits 4˝ O.D. post top tenon.*			** Must be used with cage.*	

Max height- 29", Max width - 28 3/8" (varies depending on options selected)

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The Fentress Refractive Series

FINISH	PHOTO CONTROL	COLOR TEMP	SOURCE / LUMENS	DIMMING CONTROLS
A Black B White G Verde H Bronze J Green I Gray	 E 120 VAC Button Eye H 208/240/277 VAC Button Eye * R Twistlock Receptacle N None	3K 3000K 4K 4000K	* L30 3000 LM * L55 5500 LM	* C2 Panel Control N None
	** Twistlock photocell receptacle (R), only available in (A), (B), (H), (J) and (T) pods.* *Photocell not supplied.*		** Approximate initial lumens.*	** Dimming control only offered with L55 source option. Dims to 50% of lumen output. If C2 option is used, do not select a photo control.*

Fixtures: ETL and cETL Listed. ISO 9001:2000.

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The Fentress Refractive Series: RL32/RL52

Ordering Example: RL32 A B A A 1 A N 3K L30 C1

GLOBE

RL32 Acrylic
Type III Narrow

RL52 Acrylic
Type V Narrow

POD

A

B

C

D

E

F

G

H

J

L

T

ROOF

A

B

C

D

CAGE

A

B

E

F

*G

H

N None

* Not available with pod A

BRIM

A

B

*C

*D

*E

F

G

H

N None

** Finials C, D, E cannot be used with roof B.*

FASTENER

1

Hex head bolt for post fitter and globe holder.

2

Allen head set screws for post fitter and globe holder.

Max height- 42", Max width - 17" (varies depending on options selected)

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The Fentress Refractive Series

FINISH	PHOTO CONTROL	COLOR TEMP	SOURCE / LUMENS	DIMMING CONTROLS
(A) Black (B) White (G) Verde (H) Bronze (J) Green (I) Gray	 (E) 120 VAC Button Eye (H) 208/240/277 VAC Button Eye * (R) Twistlock Receptacle (N) None	(3K) 3000K (4K) 4000K	* (L30) 3000 LM * (L55) 5500 LM	* (C2) Panel Control (N) None
	** Twistlock photocell receptacle (R), only available in (A), (B), (H), (J) and (T) pods.* *Photocell not supplied.*		** Approximate initial lumens.*	** Dimming control only offered with L55 source option. Dims to 50% of lumen output. If C2 option is used, do not select a photo control.*

Fixtures: ETL and cETL Listed. ISO 9001:2000.

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The Fentress Refractive Series: RL34/RL54

Ordering Example: RL34 B A B A 1 A N 3K L30 C1

GLOBE

RL34 Acrylic
Type III Wide

RL54 Acrylic
Type V Wide

POD

A

B

C

D

E

F

G

H

J

L

T

ROOF

A

B

C

D

G

CAGE

* B

E

F

G

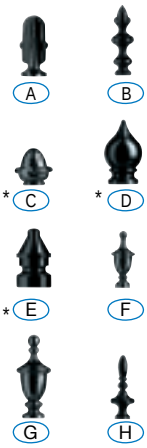
* I

* J

N None

** Not available with pod A*

BRIM



A B

* C * D

* E F

G H

N None

** Finials C, D, E cannot be used with roof B.*

FASTENER

1

Hex head bolt for post fitter and globe holder.

2

Allen head set screws for post fitter and globe holder.

Max height- 48", Max width - 17" (varies depending on options selected)

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FINISH	PHOTO CONTROL	COLOR TEMP	SOURCE / LUMENS	DIMMING CONTROLS
A Black B White G Verde H Bronze J Green I Gray	 E 120 VAC Button Eye H 208/240/277 VAC Button Eye * R Twistlock Receptacle N None	3K 3000K 4K 4000K	* L30 3000 LM * L55 5500 LM	* C2 Panel Control N None
	** Twistlock photocell receptacle (R), only available in (A), (B), (H), (J) and (T) pods.* *Photocell not supplied.*		** Approximate initial lumens.*	** Dimming control only offered with L55 source option. Dims to 50% of lumen output. If C2 option is used, do not select a photo control.*

Fixtures: ETL and cETL Listed. ISO 9001:2000.

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The Fentress Refractive Series

Hadco is proud to announce that our very popular refractive globe products have been renamed as 'The Fentress Refractive Series' in honor of the late Donald Fentress. Donald passed away very unexpectedly in January, 2009. He was very instrumental in the creation, evolution, and growth of this product line in the Municipal / Utility market, and was its greatest promoter.

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To Donald, *Onward and Upward.*

Hadco is unique among outdoor lighting companies.

The experience that we bring to any project and our commitment to quality ensures that our fixtures stand out from the crowd.

We also recognize that it isn't just about illuminating a space, but instead about creating an environment. With our luminaires and accessories, combined with a wide range of site amenities products, you are able to create an environment and a sense of community, not just a point of light.

That is the Hadco difference.

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