Varoptic®

WORLDWIDE PATENT PENDING

LED retro-fit luminaire | Delivering more than just performance

Ambience | Performance | Low Glare | Aesthetics | Variable Photometry

HEA Highway Electrical Association Award Winner 2018

LUX AWARDS 2018 HIGHLY COMMENDED

Product Brochure

Pudsey Diamond®

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Product Overview

Key Features

- Replica ‘gas mantle’ design
- Latest generation LEDs & optics
- IP66 unit with ClamPD® seal technology
- 36 to 96 Watt options*
- 70 Colour Rendering Index (CRI)
- Maintenance factor: L90B10>100,000 hrs
- 10kV surge protection
- FrugalDrive® Remote Management System option
- Low glare design
- Fits a wide range of existing heritage lanterns
- Unique rotatable reflectors (patent pending)
- Up to 129 Lumens per watt efficacy
- 2700k & 3000k colour temperature options**
- DALI enabled & pre-programmed options
- Ease of installation
- 1 & 2 mantle variants (with FrugalDrive®)

* 12 to 96 Watt options with FrugalDrive®

** More LED colour temperatures available upon request.

The Pudsey Diamond Varoptic® is designed to reduce glare and improve aesthetics of heritage style lanterns while using the latest high-power LEDs to reduce energy consumption and carbon footprint. By diffusing the light source, glare is reduced and by moving it away from the conventional flat plate LED arrays to modules which occupy some of the space within the luminaire, the appearance of the lantern is made aesthetically pleasing during both day and night. The colour temperature has been chosen to closely match the colour of gas burning in a mantle providing warm, environmental lighting.

The patented mantle diffuser carries out two functions; emulating a traditional gas mantle and a directional reflector. The mantles can be rotated 360° in 10° steps providing both directional control of the illuminated area as well as providing a shield for areas where light is not desired.

Varoptic® has been designed with thermal management at its core to maintain LED temperatures well within their specified range, even in high ambient temperatures, thus ensuring high reliability.

With standard "off-the-shelf" drivers the complete Varoptic® unit can accommodate between three and eight mantle modules offering a wide range of light outputs and illumination patterns together with the usual controllability (DALI, profiles etc.). Pudsey Diamond has also developed (in-house) a proprietary driver, FrugalDrive®, which is designed for use where CMS is not required or is unavailable. FrugalDrive® offers local wireless remote control of brightness, dusk/dawn light thresholds, daylight saving aware lighting profiles and can drive between one and eight mantles. FrugalDrive® can operate down to single mantle luminaires for more specialist requirements.

Varoptic® is a fully sealed (IP66), CE marked "drop-in" replacement luminaire designed to fit almost every type of existing heritage lantern and can be installed in minutes.

Recommended Applications

Numer of Mantles (W)	Mounting Height (m)	HPS Power (Watts)			
		50	70	100	150
3 (36)	4-6	✓	✓		
4 (48)	4-6		✓	✓	
5 (60)	5-7		✓	✓	
6 (72)	5-7			✓	✓
7 (84)	6-10			✓	✓
8 (96)	6-10				✓

All recommendations are advisory and requirements should be made based on your own knowledge, needs and specification. Demands may vary across all street lighting applications.

If you currently operate HPS lanterns which you are looking to directly replace with our Varoptic® unit, then our recommendations will give you a like-for-like substitution for your required light output.

Recommendations are based on improvement gains through accounting for S/P ratio and white light utilisation.

For further assistance and/or more information, please contact Pudsey Diamond Engineering Ltd.

It’s Glaringly Obvious!

Lighting an area using lighting columns is usually determined by the maximum spacing of the lighting columns at the minimum capital cost.

The technology of the 1980’s tended to favour High Pressure Sodium (HPS also known as SON) luminaires where intense light sources were placed within “Pot” optics. These “lenses” stretched the lighting standards allowing maximum spacing of the lighting columns, with the light source strategically placed within the luminaire to reduce glare when approaching from a distance; this is referred to as cut-off. Unless you were minded to look up from relatively close range then glare was not a common problem.

Recent developments in LED technology with arrays in luminaires have led to a multitude of optics designed to extend the area that can be illuminated by harvesting the light which would normally fall outside the design area. Manufacturers have used this technology to comply exactly with BS5489 on straight line calculations to maximise energy reduction; which when multiplied by the significant numbers of luminaires being purchased, makes a desirable saving. This approach leads to a high amount of discomfort glare as borne out by the number of louvres and shields that are offered to members of the public affected.

VAROPTIC IS DIFFERENT

In the same way that if you placed a tungsten lamp on a pendant in your home you would immediately surround it with a shade, Varoptic® softens the glare by the introduction of a diffuser shaped to imitate a gas mantle. It is available with a variable number of modules that each contain a tile of 4 LEDs running to a maximum of 12 watts and emitting in excess of 1200 lumens.

There is no addition of a refracting lens, however Varoptic® does benefit from a rotatable, bespoke reflector to project the light where it is needed - allowing directional control to the illuminated area.

Glare is reduced by the 3D-printed gas mantle diffuser which also allows the stray light to be reflected and refracted through the mantle’s perforations to give comfortable randomised light to the environment surrounding the light source. This illuminates the walls, the street and any people who may be within range of the light in the same way that low-pressure sodium lights (LPS also known as SOX) were lauded for their bathing of light over a large area; with the added benefit of warm white light to enhance the surroundings and reduce fear of crime.

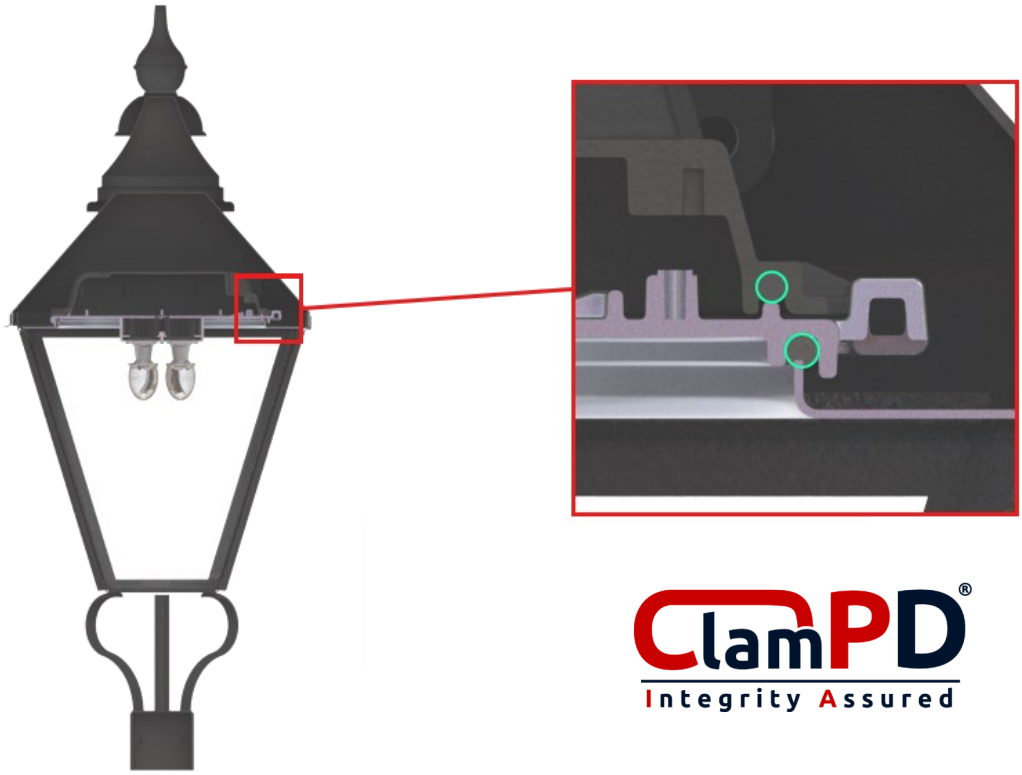
VAROPTIC IS AN ENVIRONMENTAL LUMINAIRE

You will find that Varoptic® can be used on existing HPS schemes to give comparable energy savings and uniformity. Also, day time appearance is enhanced - especially in sensitive conservation areas

Varoptic® will do the job and will illuminate the surrounding area to enhance the immediate environment which is probably why heritage lanterns were selected in the first place.

ClamPD® Seal Technology

Our unique and specifically designed ClamPD® seal technology assures the integrity of our Varoptic® luminaire through the use of compression rubber gasket sealing against moisture and dust ingress, protecting both the internal electrical components as well as the LED unit inside the luminaire.



ClamPD®
Integrity Assured

Replica Gas Mantle Design

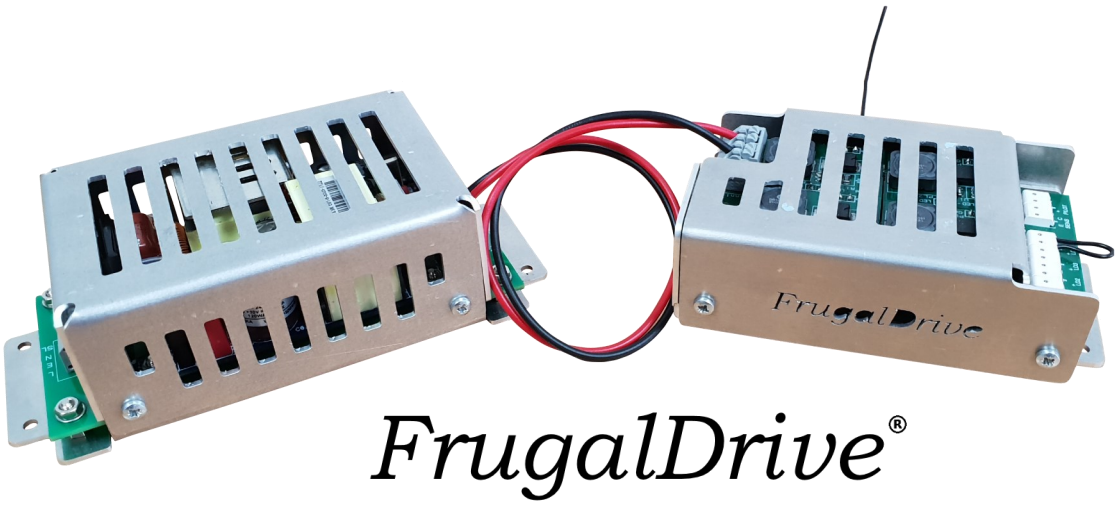
Our 3D printed optic - which replicates the original gas mantles used within gas lanterns - does more than just look the part:

- Glare is reduced by the mantle style diffuser optic which allows the stray light to be reflected and refracted through perforations to give comfortable randomised light to the environment surrounding the light source.
- Enhances an existing heritage lantern, providing a focus in the centre of the luminaire for day as well as night-time aesthetics.
- The manifold thermal design structure replicates the manifold aesthetic of gas lanterns.

FrugalDrive® Technology

FrugalDrive® is a proprietary driver, developed in-house by Pudsey Diamond, designed for use where CMS is not required or unavailable.

- Offers local wireless remote access via Pudsey Diamond Remote Management System
- Increased flexibility; drives between 1 and 8 mantle luminaires (12 to 96W)
- Dusk/dawn light thresholds with Pudsey Diamond light sensor
- Daylight savings aware lighting profiles
- Proprietary or 'off-the-shelf' daylight sensor option



FrugalDrive®

Standard 'off-the-shelf' Drivers

Driver options from leading manufacturers with the following features:

- Multiple control interfaces: DALI, LineSwitch etc.
- Long lifetime and robust protection against moisture, vibration and temperature
- Drives between 3 and 8 mantle luminaires (36 to 96W)
- Pre-programmed profiles available
- Internal node options
- 10kV surge protection
- Adjustable Start-up Time (AST)
- Constant light output (CLO) & Adjustable light output (ALO)

Performance Overview

No. of modules	Colour Temperature (K)	Max. Output Power (W)	LED Efficacy (Lm/W)	Luminaire Lumen Output[1] (Lm)	Colour Rendering Index (CRI)	S/P Ratio
3	2700	36	126	3,150	70	1.2
	3000	36	129	3,240	70	1.2
4	2700	48	126	4,250	70	1.2
	3000	48	129	4,360	70	1.2
5	2700	60	126	5,300	70	1.2
	3000	60	129	5,430	70	1.2
6	2700	72	126	6,360	70	1.2
	3000	72	129	6,530	70	1.2
7	2700	84	126	7,440	70	1.2
	3000	84	129	7,640	70	1.2
8	2700	96	126	8,510	70	1.2
	3000	96	129	8,740	70	1.2

[1] Based on teardrop luminaire style, please contact Pudsey Diamond Engineering Ltd for further information.

- LED: Nichia NV4L144ART
- LMF (lumen maintenance factor): L90B10 > 100,000 hrs
- Optics: 'Pudsey Diamond Mantle & Reflector' LED optics
- Rated Ambient Temperature of 25°C

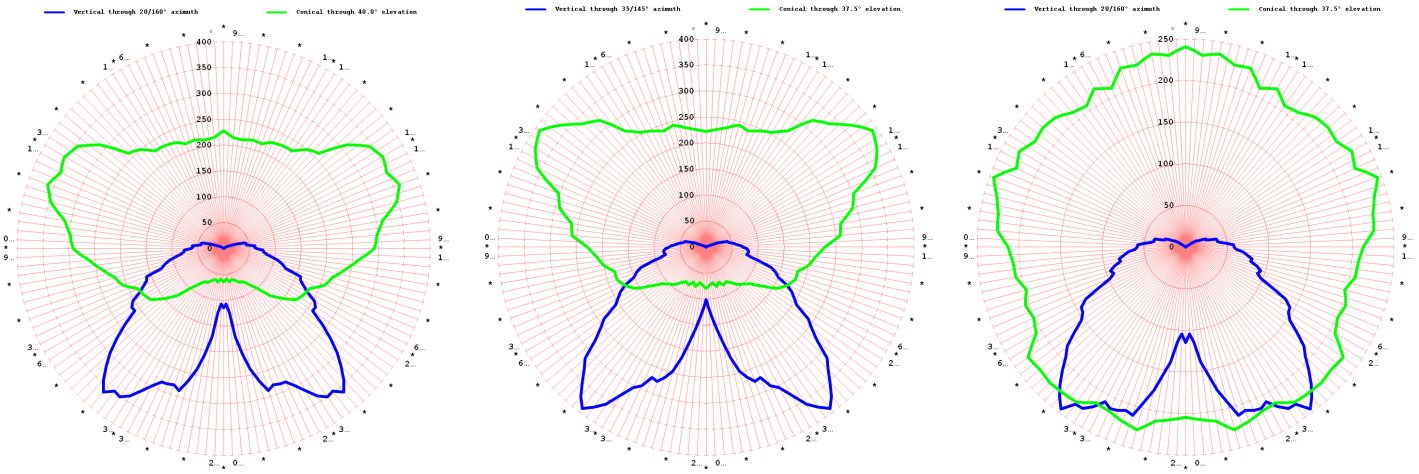
For further performance information please find detailed individual datasheets via the Varoptic® page on our website.

- Can accommodate various internal nodes
- DALI enabled
- Dimming profile options

Please note: suitable for use in ambient temperatures up to 40°C, however this will affect performance numbers;

Photometric Information

Distribution A - Narrow Road	Distribution B - Wide Road	Distribution C - Area



Vertical through 25/155° azimuth

Conical through 35.0° elevation

Contact Us

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