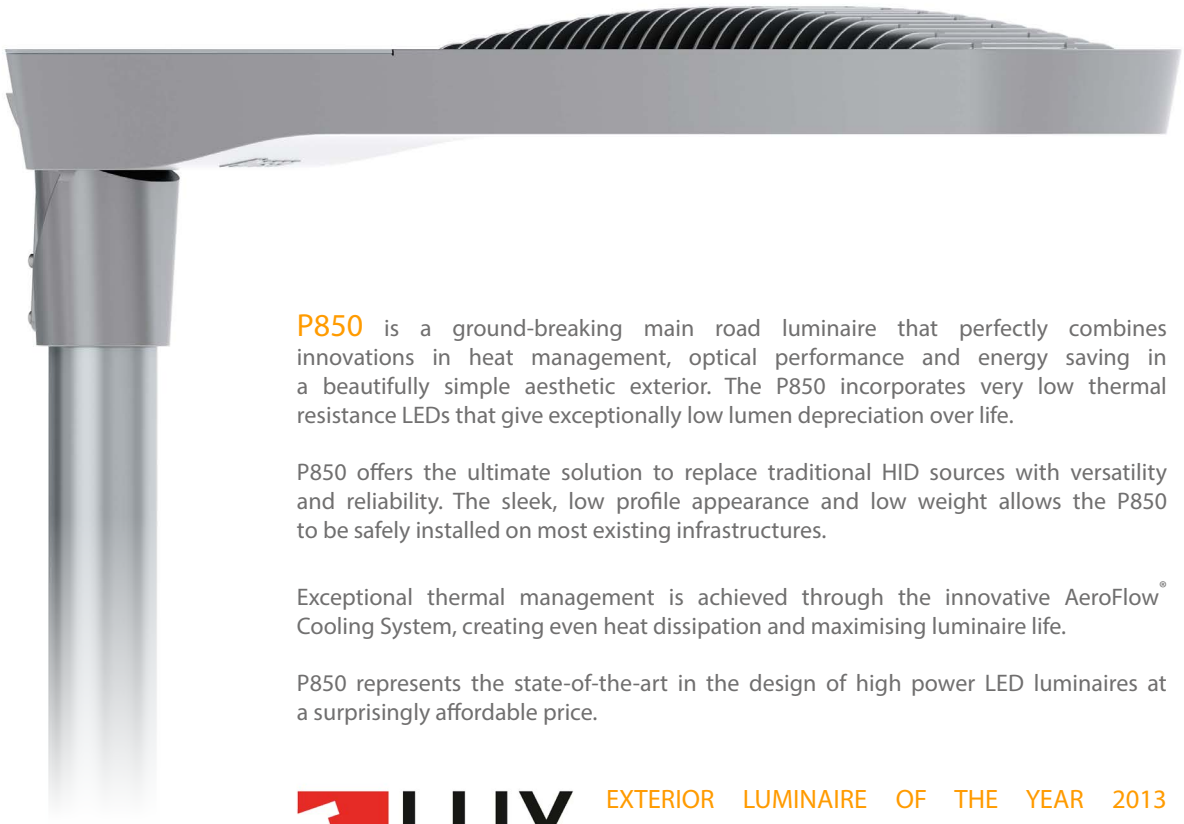
P850

Next Generation LED Luminaire
with AeroFlow® Cooling System

LUX Awards 2013 WINNER

CU Phosco LIGHTING



P850 is a ground-breaking main road luminaire that perfectly combines innovations in heat management, optical performance and energy saving in a beautifully simple aesthetic exterior. The P850 incorporates very low thermal resistance LEDs that give exceptionally low lumen depreciation over life.

P850 offers the ultimate solution to replace traditional HID sources with versatility and reliability. The sleek, low profile appearance and low weight allows the P850 to be safely installed on most existing infrastructures.

Exceptional thermal management is achieved through the innovative AeroFlow® Cooling System, creating even heat dissipation and maximising luminaire life.

P850 represents the state-of-the-art in the design of high power LED luminaires at a surprisingly affordable price.

LUX Awards 2013 WINNER

EXTERIOR LUMINAIRE OF THE YEAR 2013

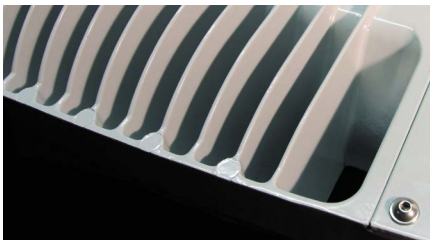
"Judges were impressed by the elegant design and efficient heat management of CU Phosco's latest LED road lantern..." - Lux Magazine

BENEFITS

- Slim, elegant and state-of-the-art design
- Next generation high flux density and efficacy LED
- Superior luminaire efficacy up to 122 lm / W
- AeroFlow® Cooling System
- L_{90} > 100,000 hrs (350mA, Ta = 25ºC)
- L_{85} > 100,000 hrs (700mA, Ta = 25ºC)
- Maximised savings on energy and maintenance costs
- Minimal total cost of ownership (TCO)
- Up to ME1 lighting class applications
- G6 glare rating. Dark sky friendly, no upward light
- Flexible and intelligent lighting control options
- Lightweight and low windage allowing retrofit onto most existing columns
- IP66 ingress protection
- 100% recyclable, low carbon footprint

FLEXIBLE MOUNTING OPTIONS

Choice of side entry spigots Ø34-42mm or Ø42-60mm and post top spigots Ø42-60mm or Ø76mm (nominal diameters) providing -10°, -5°, 0°, +5° and +10° tilt in both post top and side entry arrangements with permanent indication on the luminaire.



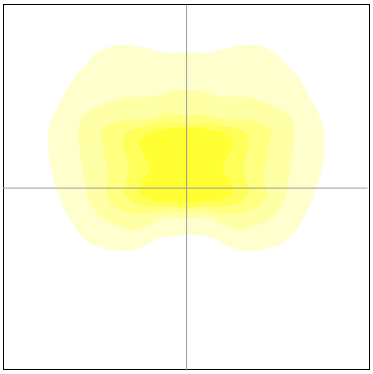
EXCEPTIONAL OPTICAL PERFORMANCE

- Standard Neutral White LEDs (CCT = 4000K)
- Colour Rendering Index > 70
- Improved mesopic vision
- Exceptional uniformity
- Dark sky friendly (zero upward light)
- Minimal glare (G6)

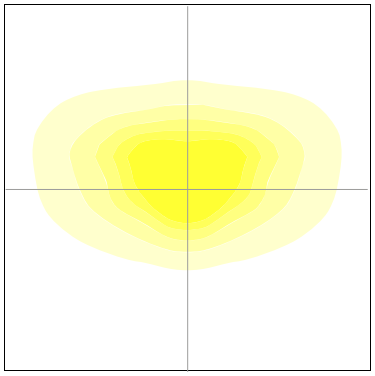
Luminaire Luminous Flux	10600 ~ 31700 lm
Luminaire Efficacy	up to 122 lm/W

REFLECTOR TECHNOLOGY

Each luminaire incorporates up to three reflector-groups manufactured from high-spec 95% total reflectance aluminium. Reflectors can be individually selected from a range of distributions to build a combined photometric output to suit the most challenging scheme.



Wide



Standard

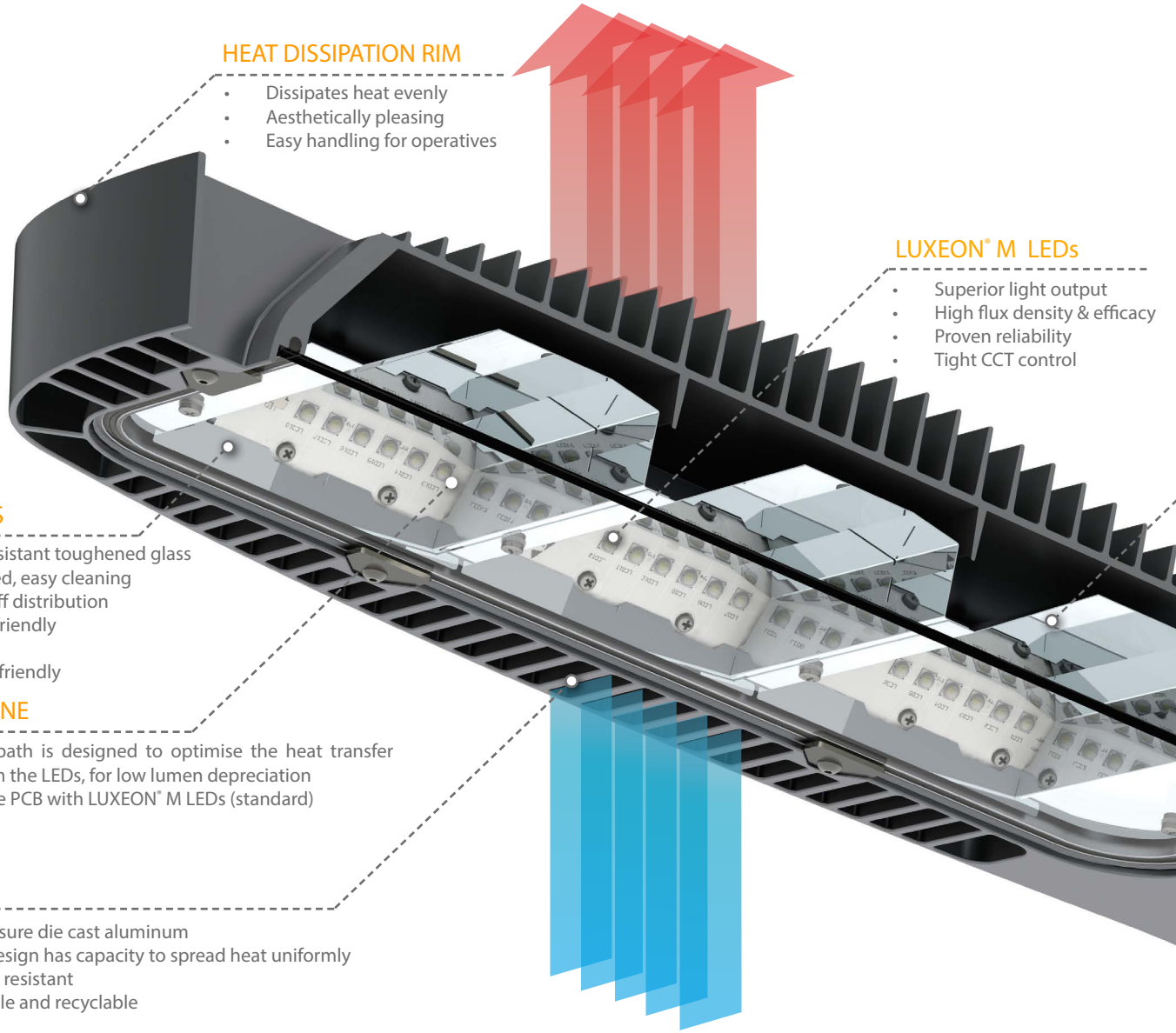
Two examples of lighting distribution

HEAT DISSIPATION RIM

- Dissipates heat evenly
- Aesthetically pleasing
- Easy handling for operatives

LUXEON® M LEDs

- Superior light output
- High flux density & efficacy
- Proven reliability
- Tight CCT control



FLAT GLASS

- Vandal resistant toughened glass
- IP66 sealed, easy cleaning
- Full cut-off distribution
- Dark sky friendly
- Low glare
- Pollution friendly

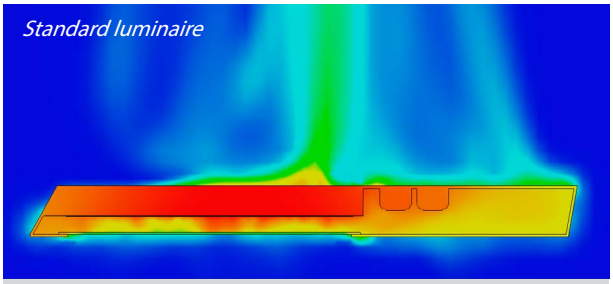
LIGHT ENGINE

- Thermal path is designed to optimise the heat transfer away from the LEDs, for low lumen depreciation
- Metal core PCB with LUXEON® M LEDs (standard)

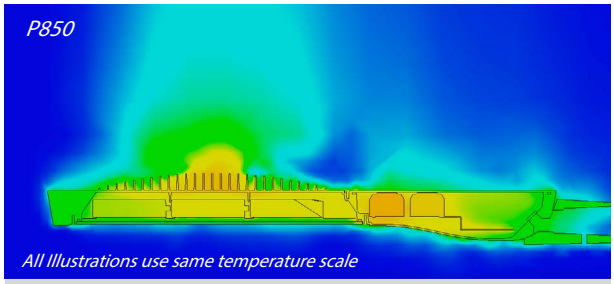
HOUSING

- High pressure die cast aluminum
- Unique design has capacity to spread heat uniformly
- Corrosion resistant
- Sustainable and recyclable

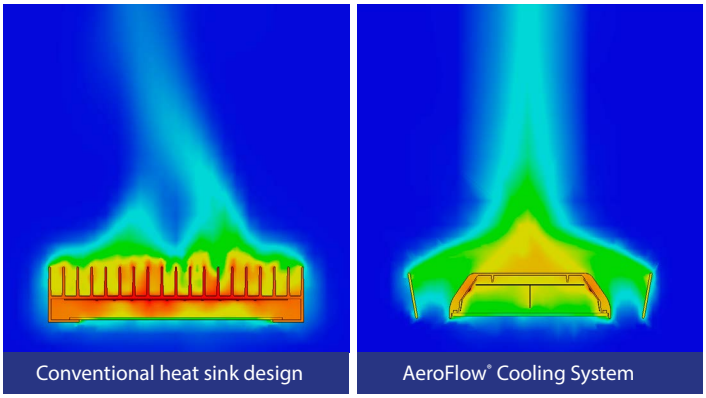
LONGITUDINAL THERMAL DISTRIBUTION



Most high power luminaires that use modular LED panels have issues of centralised heating. LEDs in the centre of the luminaire cannot be cooled as effectively as those near the edge, with a shorter lifetime and faster depreciation of performance.



P850 addresses this problem elegantly by using linear PCBs on the sides. Fewer high powered LEDs, placed strategically along the luminaire, allows the unique geometry of the housing to maintain all LEDs at an even low temperature.

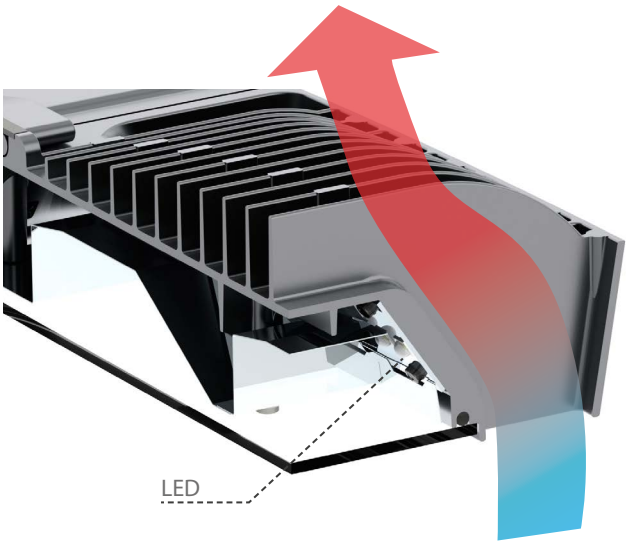


Conventional heat sink design

AeroFlow® Cooling System

AeroFlow® COOLING SYSTEM

Unique aerodynamic vents created by the vertical fins and the outer rim are designed to accelerate natural convection through the heatsink. Each airway is heated and the rising hot air draws cold air in from the bottom, immediately cooling the LEDs. On leaving the vents, the hot air converges smoothly into a laminar flow, quickly removing heat from the luminaire.



HIGH EFFICIENCY REFLECTORS

- >95% Total Reflectance
- Highly specular surface

THERMAL BARRIER

- Gear and optical compartments are separated for optimised thermal management

PROGRAMMABLE LED DRIVER

- Long lifetime and robust protection against temperature, moisture and vibration
- Module Temperature Protection (MTP)
- Integrated Dynadimmer, 1 - 10V or DALI dimming inputs
- Adjustable Output Current (AOC)
- Constant Light Output (CLO)

ACCESS PANEL

- Spacious and secure access area
- IP66 sealed

INTERFACING FINS

- Dissipate driver's heat into housing
- Increase driver's life and reliability

SPIGOT CAP

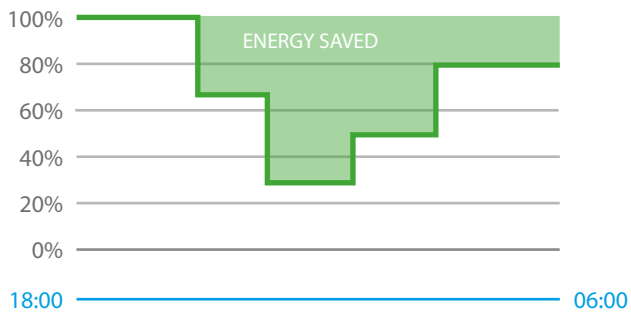
- Side Entry Ø34 - 42mm and Ø42 - 60mm
- Post Top Ø42 - 60mm and Ø76mm

DYNADIMMER

The Xitanium electronic driver incorporates the Dynadimmer feature, a programmable 5-step dimming system which will generate substantial energy savings by providing the precise amount of light at the right time.

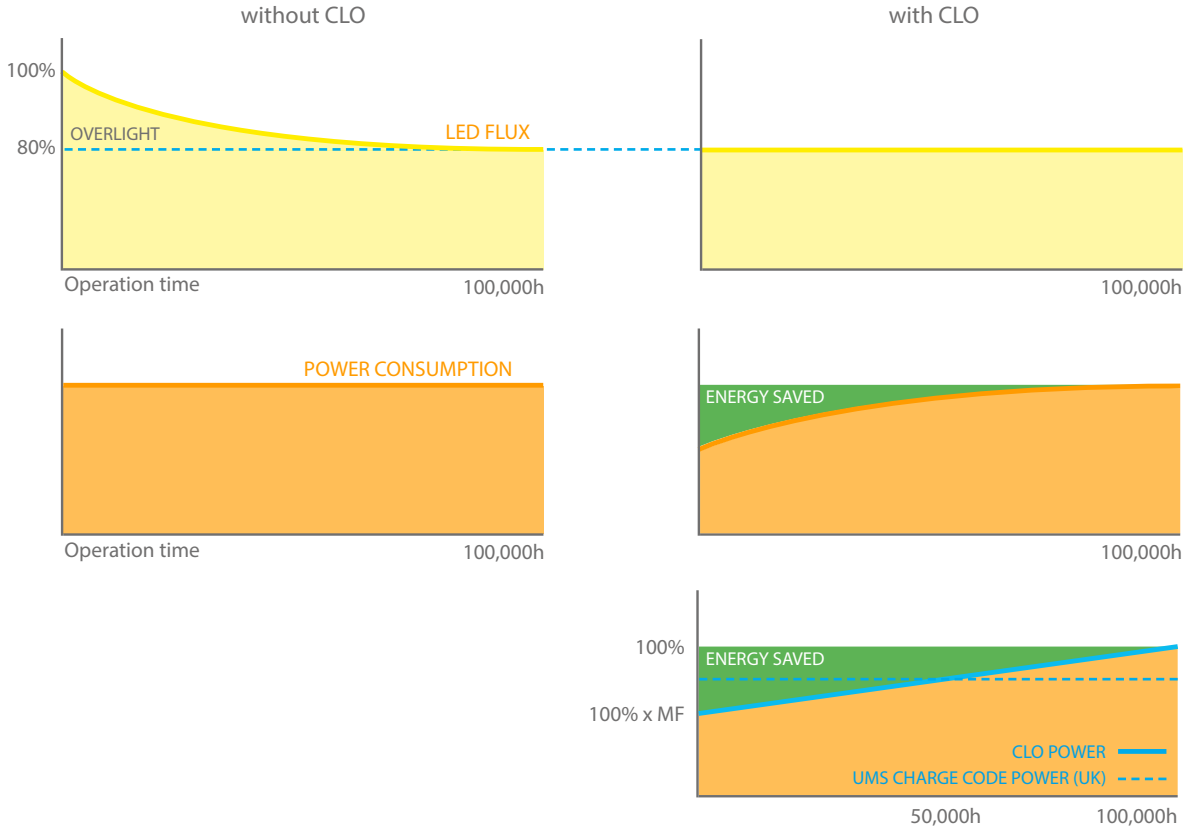
The times and light levels are fully flexible to suit the lighting profile required.

The driver is able to calculate the virtual clock time by analysing the duration of operation of the driver from the previous 3 days and sets the times of 5 light level steps accordingly.



CONSTANT LIGHT OUTPUT (CLO)

All light sources experience lumen depreciation - a reduction in light output over time, which means the system would consume more power than necessary to meet the required light levels at the end of the lamp's useful life (e.g. L80). The drivers of the P850 can be programmed to ensure that the LEDs will always deliver the necessary light level, by increasing the operating current over time to compensate for the LED lumen depreciation. Over-lighting at the beginning is taken away and this feature can produce extra energy saving and extend the lifetime of the system.



ENERGY EFFICIENCY

The exceptional thermal management in P850 together with the high performing LEDs and optics deliver a flexible range of solutions for your street lighting project. Solutions can be selected to meet the various lighting class requirements, with significant maintenance and energy savings over conventional luminaires.

								CLO ENABLED[2]	
Class	HID Lamp	System Power	Luminaire Efficacy[1]	Typical P850 Replacement	System Power	Energy Savings	Luminaire Efficacy	System Power	Energy Savings
ME1	400W SON	449W	102 lm/W	31,700 lm @700mA	302W	33%	105 lm/W	279W	38%
	315W CDM	341W	89 lm/W	28,000 lm @600mA	259W	24%	108 lm/W	239W	30%
ME2	315W CDM	341W	89 lm/W	22,000 lm @450mA	195W	43%	113 lm/W	180W	47%
	250W SON	301W	90 lm/W	17,600 lm @350mA	151W	50%	117 lm/W	140W	54%
ME3	150W SON	180W	80 lm/W	13,000 lm @250mA	108W	40%	120 lm/W	102W	43%

[1] HID Luminaire LOR = 75%

[2] Average power consumption with CLO is based on UMS charge code power

PROGRAMMABLE LIGHTING CONTROLS

The Xitanium driver enables CU Phosco Lighting to adjust the light level to match a specific application with optimised energy savings. The various control options offer different levels of energy savings, from simple stand-alone controls to more advanced networked Central Management Systems (CMS).

P850 is currently compatible with the following CMS:

- Ask Controls RMS
- Harvard LeafNut
- Mayflower
- Philips Starsense
- Telensa PLANet
- Zodion Vizion

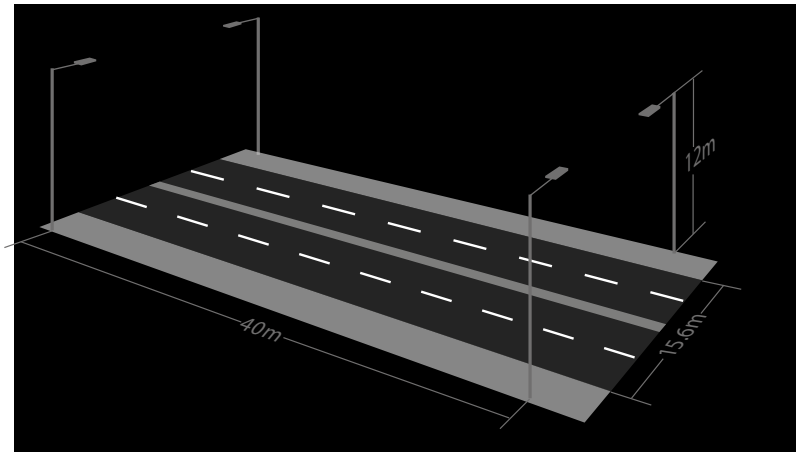
CONTROL SYSTEM	BENEFITS	FUNCTIONALITY	RELATIVE SAVING	With CLO
Photocell	Standard control	Switch on/off with ambient light level	0%	up to 10%
Dynadimmer	Substantial energy saving	Programmable dimming (5 steps)	up to 20%	up to 30%
Wireless CMS	Full control and monitoring of each individual luminaire	DALI and 1-10V dimming inputs with full CMS functionality	up to 40%	up to 50%

SCHEME EXAMPLE

Road refurbishment ME2 lighting class (EN13201)

Luminaire replacement on dual carriage way with existing column at 40m spacing, 12m height and opposite arrangement.

Result:
P850 can replace a conventional 250W HPS luminaire with better performance (improved uniformity, less glare). 20-60% energy savings are achievable depending on column spacing, road configuration and lighting class with the added comfort of white light. Further savings can be achieved using controls like LumiStep, Dynadimmer or a Central Management System.

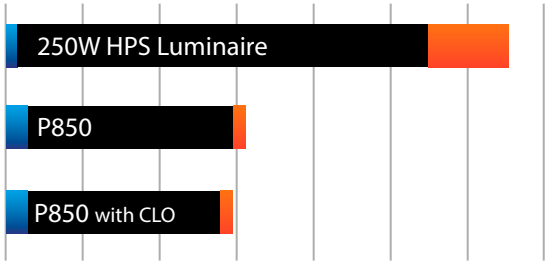


	Lave (cd/m²)	Uo	Ul	Ti (%)	SR	W (System)	W / km
Target (ME2)	1.5	0.4	0.70	10	0.5	-	-
250W HPS Luminaire	2.6	0.71	0.70	9.8	0.68	301	7525
P850	1.5	0.81	0.82	6.6	0.81	151	3775
P850 (with CLO)	1.5	0.81	0.82	6.6	0.81	140	3500

TOTAL COST OF OWNERSHIP

While HID technology has low initial cost, it requires frequent maintenance that results in a high total cost of ownership.

P850 with dimming and CLO options delivers an attractive total cost of ownership package making it extremely competitive for invest-to-save scenarios.

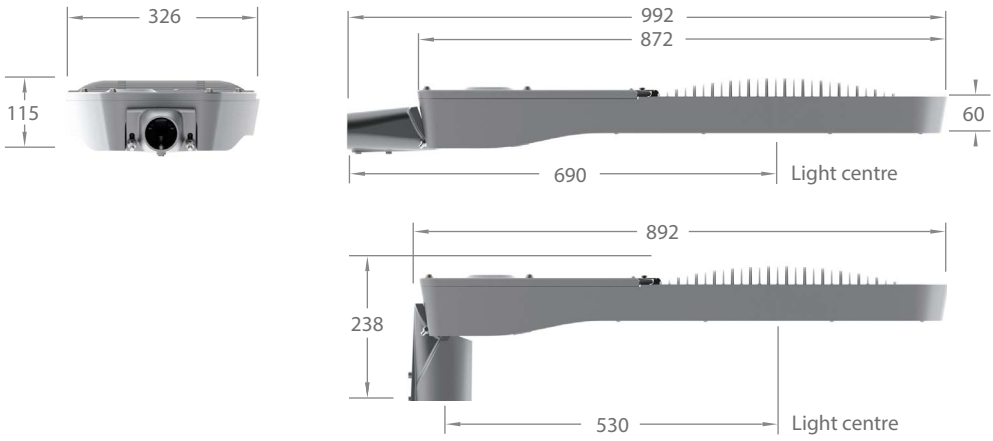


Luminaire & Installation
Energy consumption
Maintenance (including HPS lamp replacement)

*Based on example above, 20 years lifetime

P850 SPECIFICATION

Light Source	Philips Lumileds LUXEON® M LEDs
Number of LEDs	36
Power Consumption	89 ~ 302W
Correlated Colour Temperature	Neutral white, 4000K
Glare Rating	G6
Colour Rendering Index	> 70
Optical Cover	Flat Glass
Luminaire Luminous Flux	10,600 ~ 31,700 lm
Luminaire Efficacy	Up to 122 lm/W
Electrical Class	I
Control System Input	1-10V and DALI
Lumen Maintenance Output	L_{85} > 100,000 hours (700mA, Ta = 25°C)
	L_{90} > 100,000 hours (350mA, Ta = 25°C)
Driver Current	200mA ~ 700mA (in 50mA steps)
Surge Protection	ANSI C62.41.2 high exposure 10kV, 10kA level
Dimming Control	Dynadimmer
Lighting Regulation	Mini Photocell • NEMA Socket • Wireless CMS options
Operating Temperature	-40°C to +25°C (700mA)
	-40°C to +40°C (350mA)
Installation Height	8 ~ 18m
Installation	SE Ø 34-42 Ø 42-60, PT Ø 42-60 Ø 76 mm
Post Top / Side Entry Tilt	-10°, -5°, 0°, 5°, 10°
Material	High pressure die cast aluminium (housing)
Finish	Polyester powder coat cured under heat
Colours	Iron grey (RAL 7011), other RAL colours available on request
Ingress Protection	IP66
Wind Area (SCx)	0.052m²
Weight (Total)	15kg



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