

**BINAY
LED-based Street Light Luminaires**

BINAY's LED-based Street Light Luminaires offer low power consumption and maintenance-free long life – a true 'GREEN' lighting product

BINAY LED-based Street Lights utilize the latest cutting-edge developments in Light Emitting Diode technology to offer the following benefits:

- **Low power consumption** (making them ideal for use in solar-powered applications)
- **Long life, which ensures zero maintenance costs:** *The life of LEDs is more than 50,000 hours (to 70% lumen maintenance), as compared to much lower life for conventional light sources. The LED does not have catastrophic failure, but gradually degrades to extinction – light output is available even after 20 years of operation (50% light after 20 years).*
- **Effective visibility of light output comparable to different types of conventional lamp luminaires**
- **High optical conversion efficiency** (up to 95%), as compared to around 50% for CFL-based luminaires

- **Light output can be directed in specific directions by the use of Total Internal Reflection (TIR) lenses; no losses of reflection/refraction or lamp (source) obstruction in the luminaire:** *Such losses occur with conventional lights like fluorescent, CFL, HPSV, HPMV and metal halide, which emit light in 360°, and thus require a reflecting/refracting luminaire to redirect the light emitted from the top surface of the lamp. Furthermore, as these light sources are of a large size and volume, light spillage occurs on to points where light is not required.*

The LED light output is 180° in nature, and can therefore be directed as desired with Total Internal Reflection lenses (which enable each LED module to have a different beam angle). This results in very low luminaire loss and high efficiency.

- **No Light Pollution:** *Conventional light source luminaires such as metal halide and HPSMV luminaires are not able to focus all their light onto the target area, but scatter the output onto unwanted areas such as windows of nearby buildings (causing disturbance to occupants at night), and even into the sky. This is known as **light pollution**. This unwanted light is not only wasted light, but creates disturbance and glare to residents, as also to viewers of the night-time sky.*

- **NO infra-red or ultra-violet radiation:** *Conventional light sources are plagued by infra-red and ultra-violet radiation, which has detrimental effects.*

- **Environment-friendly operation (as they contain no mercury or heavy metals):** *Mercury (used in fluorescent lamps) is a hazardous substance.*

- **Loss of a single LED module does not affect the reliability of the light:** *In case of conventional single-source lamp type lights, failure of the light source results in no light.*



BINAY's new 'Eagle-Eye' LED Street Light
(Adjustable Asymmetric Beam design)

This design has an arrangement for adjusting the beam pattern, which allows it to cover locations with different pole-to-pole distances while providing even illumination coverage



BINAY Shoebox Head LED Street Light
(Fixed Asymmetric Beam design)



...continued (2)



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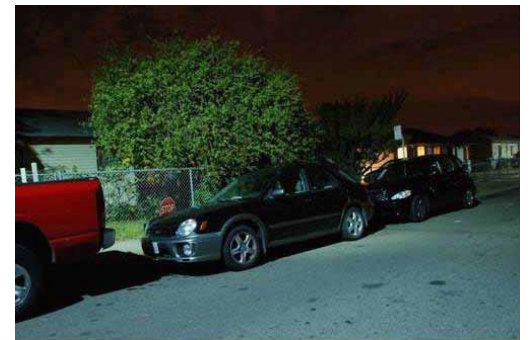
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- **Greater Visual Efficiency than HPSV lamps:** *The human eye is more sensitive to blue emission in low ambient light conditions, such as at night time (mesopic region). Given this night vision property of the eye, even though a high pressure sodium vapour (HPSV, which consists of predominantly yellow light) has an efficiency of 100-120 Lm/w, its effective visual utilization is only about 20 Lm/w; that is, the photopic lux value of the HPSV lamp falls to 1/7th of its measured value in comparison to a light source having predominantly blue light output (such as LEDs). As such, a unit lux level of LED light is visibly equivalent to 7 lux of HPSV at night time (in mesopic light ambience conditions).*
- **Better Peripheral vision:** *The 'Rods' in the human eye, which contribute to peripheral vision, are not activated by HPSV light. Activities occurring at the periphery of vision may not register properly (e.g., a motorist may not perceive a pedestrian at the side of the road), resulting in an accident.*
- **Better Focus and Perception of Detail:** *The pupil of the eye is activated by blue wavelengths, and in its absence (as in HPSV light) the pupil is wide open. This affects the depth of focus of the eye, making it difficult to focus on detail.*
- **Colour Rendering Index (CRI) of HPSV is only 22 (CRI of sunlight at noon is 100). Colours are not seen properly, creating an unpleasant visual ambience.**
- **LEDs give more light at lower temperatures:** *Conventional discharge lamp operation is dependent on ambient temperature. At low temperatures, low pressure discharge lamps (like fluorescent tubes and CFLs) give lower light output. Their striking voltage also rises, making them difficult to start – which then leads to rapid failure of the tube.*
- **Instant switch-on:** *High pressure discharge lamps have a delay when first switching on. Moreover, when restarting, a restarting time is necessary for cooling of gas. LEDs have no such problem, and light up immediately.*
- **Vibration resistant:** *Being solid-state, LED lamps can withstand shocks and vibration, unlike fragile glass filament and discharge lamps*



THE VISUAL PERCEPTION PROBLEM: A street illuminated with HPSV lighting



Same street illuminated with white scotopically enhanced LED light: Improved Colour Rendering and perception of detail

While the initial capital cost is higher, the total lifetime cost of ownership is extremely low. **The payback period can be as low as 3 to 4 years (after which the product essentially becomes 'free' for the next 10 to 15 years).**

BINAY LED Street Lights are available in two basic designs – Eagle Eye Adjustable Asymmetric Beam (EE) design and Shoebox Head Fixed Asymmetric Beam (SB) design.

Eagle Eye Adjustable Asymmetric Beam (EE) design: This has an adjustable system for precise adjustment of the dispersion of the light beam to the sides, by means of adjustable side bars. The light output to the sides can thus be user-adjusted to requirement as desired.

This design has two variants or types:

1. EE-DX (Eagle Eye DX): **Adjustable** beam, standard current, greater number of LEDs, higher rated life
2. EE-ECO (Eagle Eye ECO): **Adjustable** beam, lesser number of LEDs running at higher current for same light output, but lower rated life. These are more economical than Eagle Eye DX in view of the fewer LEDs.

Shoebox Head Fixed Asymmetric Beam (SB) design: This design has a fixed dispersion to the side, achieved by using special asymmetric lenses. The light output to the sides is fixed, and cannot be user-adjusted.

This design also has two variants or types:

1. Shoebox-ST (Shoebox Standard): Fixed beam, standard current, greater number of LEDs, higher rated life
2. Shoebox-ECO (Shoebox ECO): Fixed beam, lesser number of LED running at higher current for same light output, but lower rated life. Again, these are more economical than Shoebox-ST in view of the fewer LEDs.

NOTE: *The adjustable beam of the Eagle Eye design allows it to give a MUCH WIDER dispersion of light than the fixed beam type, which can also be adjusted depending on the inter-pole distance between two successive poles. The dispersion of the beam in the fixed beam type is achieved by means of asymmetric lenses, and cannot be changed.*

Available models of BINAY LED Street Lights (in both designs and variants) are enumerated on the following page.



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BINAY LED STREET LIGHT MODELS

TO REPLACE 50W HPSV OR 35W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|-------------|---|----------------|---------------|-------------------------------------|--|
| EE-DX-15-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) – Adjustable side light for pole distances up to 50m | 15 | 20W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| EE-ECO-9H-L | | 9H | 30W | 3W (High current through LED) | Life > 50,000 hours; 7-10 years Warranty of 3 years |
| SB-ST-15-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 15 | 20W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |
| SB-ECO-9H-L | | 9H | 27W | 3W (High current through LED) | Life > 35,000 hours; 5-8 years Warranty of 2 years |

TO REPLACE 70W HPSV OR 50W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|--------------|--|----------------|---------------|-------------------------------------|--|
| EE-DX-24-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) | 24 | 35W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| EE-ECO-15H-L | | 15H | 45W | 3W (High current through LED) | Life > 50,000 hours; 7-10 years Warranty of 3 years |
| SB-ST-24-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 24 | 35W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |
| SB-ECO-15H-L | | 15H | 45W | 3W (High current through LED) | Life > 35,000 hours; 5-8 years Warranty of 2 years |

TO REPLACE 150W HPSV OR 70W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|--------------|--|----------------|---------------|-------------------------------------|--|
| EE-DX-36-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) | 36 | 48W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| EE-ECO-21H-L | | 21H | 65W | 3W (High current through LED) | Life > 50,000 hours; 7-10 years Warranty of 3 years |
| SB-ST-36-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 36 | 50W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |
| SB-ECO-21H-L | | 21H | 65W | 3W (High current through LED) | Life > 35,000 hours; 5-8 years Warranty of 2 years |

TO REPLACE 250W HPSV OR 150W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|--------------|--|----------------|---------------|-------------------------------------|--|
| EE-DX-54-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) | 54 | 75W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| EE-ECO-30H-L | | 30H | 90W | 3W (High current through LED) | Life > 50,000 hours; 7-10 years Warranty of 3 years |
| SB-ST-48-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 48 | 75W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |
| SB-ECO-33H-L | | 33H | 100W | 3W (High current through LED) | Life > 35,000 hours; 5-8 years Warranty of 2 years |

TO REPLACE 350W HPSV OR 250W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|--------------|--|----------------|---------------|-------------------------------------|--|
| EE-DX-90-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) | 90 | 120W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| EE-ECO-54H-L | | 54H | 165W | 3W (High current through LED) | Life > 50,000 hours; 7-10 years Warranty of 3 years |
| SB-ST-90-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 90 | 120W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |
| SB-ECO-48H-L | | 48H | 145W | 3W (High current through LED) | Life > 35,000 hours; 5-8 years Warranty of 2 years |

TO REPLACE 400W HPSV OR 350W METAL HALIDE/CDMT

| BINAY Model | Design | Number of LEDs | Total Wattage | Wattage per LED | LIFE / WARRANTY |
|-------------|--|----------------|---------------|-------------------------------------|--|
| EE-DX-126-L | EAGLE EYE-DX (ADJUSTABLE Asymmetric Beam) | 126 | 170W | 1.2W (Standard current through LED) | Life > 100,000 hours; more than 20 yrs. Warranty of 5 years |
| SB-ST-126-L | SHOEBOX-ST HEAD (Fixed Asymmetric Beam) | 126 | 170W | 1.2W (Standard current through LED) | Life > 60,000 hours; 10-15 years Warranty of 4 years |

Note: All ECO models (in both Eagle-Eye and Shoebox designs) run at a higher current. While this allows greater light output from each LED (thus reducing the number of LEDs, and hence the cost), the efficiency is lower and heat generation is greater, affecting life and LED light depreciation.



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EAGLE EYE MODELS (WITH ADJUSTABLE ASYMMETRIC BEAM)

EAGLE EYE-DX (ADJUSTABLE ASYMMETRIC BEAM) LED STREET/AREA LIGHT

Features

- Wattage per LED: 1.2W
- Adjustable Asymmetric Beam
- Heavy heat sinking
- Power factor > 0.9
- THD < 15%
- EMI/RFI Filter
- Life > 100,000 hours; more than 20 years
- Warranty of 5 years

| Model | Number of LEDs | Wattage | APPROXIMATE EQUIVALENT TO: | |
|-------------|----------------|---------|----------------------------|-------------------|
| | | | HPSV | METAL HALIDE/CDMT |
| EE-DX-15-L | 15 | 20W | 50W | 35W |
| EE-DX-24-L | 24 | 35W | 70W | 50W |
| EE-DX-36-L | 36 | 48W | 150W | 70W |
| EE-DX-54-L | 54 | 75W | 250W | 150W |
| EE-DX-90-L | 90 | 120W | 360W | 250W |
| EE-DX-126-L | 126 | 170W | 400W | 350W |

EAGLE EYE-ECO (ADJUSTABLE ASYMMETRIC BEAM) LED STREET/AREA LIGHT

Features

- Wattage per LED: 3W (High current through LED)
- Adjustable Asymmetric Beam – adjustable side light for pole distances up to 50m
- Thermal Management
- Life > 50,000 hours; 7-10 yrs.
- Warranty of 3 years

| Model | Number of LEDs | Wattage | APPROXIMATE EQUIVALENT TO | |
|--------------|----------------|---------|---------------------------|---------|
| | | | HPSV | MH/CDMT |
| EE-ECO-9H-L | 9H | 30W | 50W | 35W |
| EE-ECO-15H-L | 15H | 45W | 70W | 50W |
| EE-ECO-21H-L | 21H | 65W | 150W | 70W |
| EE-ECO-30H-L | 30H | 90W | 250W | 150W |
| EE-ECO-54H-L | 54H | 165W | 360W | 250W |
| EE-ECO-90H-L | 90H | 270W | 400W PLVS | 350W |

SHOEBOX HEAD MODELS (FIXED ASYMMETRIC BEAM)

SHOEBOX-ST HEAD (FIXED ASYMMETRIC BEAM) LED STREET/AREA LIGHT

Features

- Fixed asymmetric beam (70°)
- Box shape body for better thermal management
- Life > 60,000 hours; 10-15 years
- Warranty of 4 years

| Model | Number of LEDs | Wattage | APPROXIMATE EQUIVALENT TO: | |
|-------------|----------------|---------|----------------------------|---------|
| | | | HPSV | MH/CDMT |
| SB-ST-15-L | 15 | 20W | 50W | 35W |
| SB-ST-24-L | 24 | 35W | 70W | 50W |
| SB-ST-36-L | 36 | 50W | 150W | 70W |
| SB-ST-48-L | 48 | 75W | 250W | 150W |
| SB-ST-90-L | 90 | 120W | 360W | 250W |
| SB-ST-126-L | 126 | 170W | 400W PLVS | 350W |

SHOEBOX-ECO HEAD (FIXED ASYMMETRIC BEAM) LED STREET/AREA LIGHT

Features

- Wattage per LED: 3W (High current through LED)
- Fixed asymmetric beam
- Direct thermal management
- Life > 35,000 hours; 5-8 years
- Warranty of 2 years

| Model | Number of LEDs | Wattage | APPROXIMATE EQUIVALENT TO: | |
|--------------|----------------|---------|----------------------------|---------|
| | | | HPSV | MH/CDMT |
| SB-ECO-9H-L | 9H | 27W | 50W | 35W |
| SB-ECO-15H-L | 15H | 45W | 70W | 50W |
| SB-ECO-21H-L | 21H | 65W | 150W | 70W |
| SB-ECO-33H-L | 33H | 100W | 250W | 150W |
| SB-ECO-48H-L | 48H | 145W | 360W | 250W |



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