

Comparison of energy and maintenance: LED armor 55W Vs traditional armor 150W

1 km street lighting systems with 50 armor (20 mt distance for each Lamp)

| | | Led Armor | Traditional Armor |
|---------------------------------|--------|-----------|-------------------|
| Wattage of lamps | W | 55 | 150 |
| Average daily consumption | KW/h | 33 | 90 |
| Electricity Cost | €/KW/h | 0,30 | 0,30 |
| Average annual consumption | KW/h | 12.045 | 32.850 |
| Average consumption in 10 years | KW/h | 120.450 | 328.500 |
| Lifetime | HOURS | 50.000 | 20.000 |

| Armor Type | Initial investment cost | 1 year Energy Cost | 10 years Energy Cost | Maintanace Cost * | Total Costs | |
|------------------------|----------------------------|--------------------|------------------------------|--------------------|---------------------|--------------------|
| 150w sodium vapor lamp | € 12.650,00 | € 9.855,00 | € 98.550,00 | € 15.040,00 | € 126.240,00 | |
| 55W LED lamp | € 25.000,00 | € 3.613,50 | € 36.135,00 | € 4.200,00 | € 65.335,00 | |
| | 1 year Power saving | € 6.241,50 | 10 years Power saving | € 62.415,00 | Total Saving | € 60.905,00 |

Comparison of energy and maintenance: LED armor 110W Vs traditional armor 250W

1 km street lighting systems with 40 armor (25 mt distance for each Lamp)

| | | Armatura Led | Armatura Lampada |
|---------------------------------|--------|--------------|------------------|
| Wattage of lamps | W | 110 | 250 |
| Average daily consumption | KW/h | 52,8 | 120 |
| Electricity Cost | €/KW/h | 0,30 | 0,30 |
| Average annual consumption | KW/h | 19.272 | 43.800 |
| Average consumption in 10 years | KW/h | 192.270 | 438.000 |
| Lifetime | HOURS | 50.000 | 20.000 |

| Armor Type | Initial investment cost | 1 year Energy Cost | 10 years Energy Cost | Maintanace Cost * | Total Costs | |
|------------------------|----------------------------|--------------------|------------------------------|--------------------|---------------------|--------------------|
| 250w sodium vapor lamp | € 11.200,00 | € 13.140,00 | € 131.400,00 | € 19.500,00 | € 162.100,00 | |
| 110W LED lamp | € 28.000,00 | € 5.781,60 | € 57.816,00 | € 5.450,00 | € 91.266,00 | |
| | 1 year Power saving | € 7.358,40 | 10 years Power saving | € 73.584,00 | Total Saving | € 70.834,00 |

* Maintenance work in 10 years

Sodium vapor lamp: Replace n° 3 Lamp, n. 3 replace Drivers, Replace n° 2 ballast;

LED lamp: Replace n. 1 Power supply

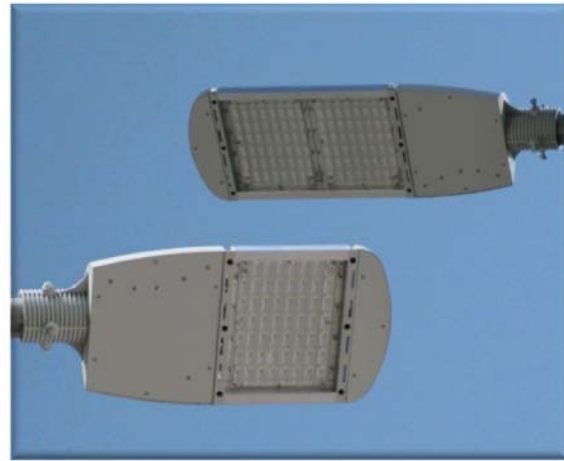


LED ARMOR FOR PUBLIC STREET LIGHTING



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Armor street light with LED technology to save energy and absolute absence of light pollution



MECHANICAL SPECIFICATION

Body : Polycarbonate, U.V stabilized.;
Heatsink : cast aluminum anodized;
Lens : P.M.M.A. Patented n° BA2009A000011;
Product dimension: 580mmx260mmx90 mm single module - 780mmx260mmx90 mm dual module
Screws: stainless steel;
Seals: silicone;
Mounting: diam. 60 mm
Weight: Kg. 3,80 single module – Kg. 5,80 dual module
Wind load at working position: 0,10 m2;
Wind load to MAX surface : 0,28 m2;
IP GRADE : IP65

ELECTRICAL SPECIFICATION

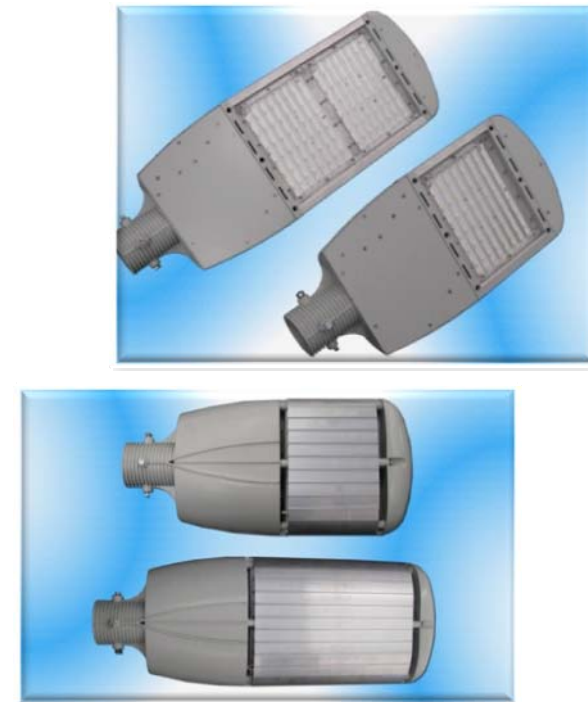
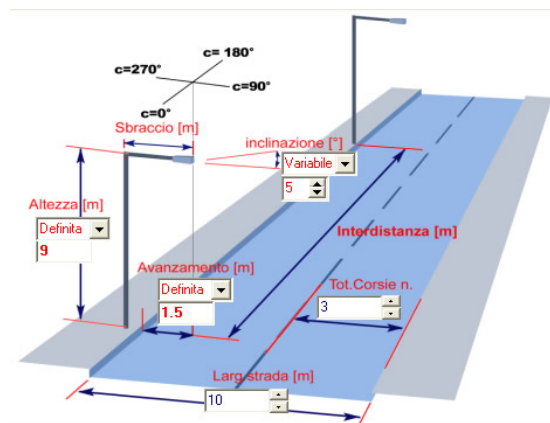
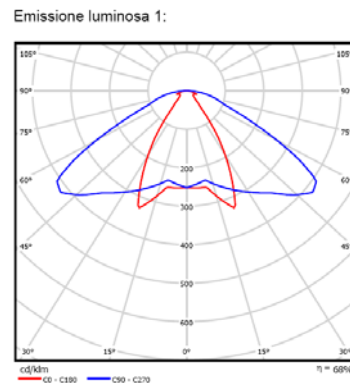
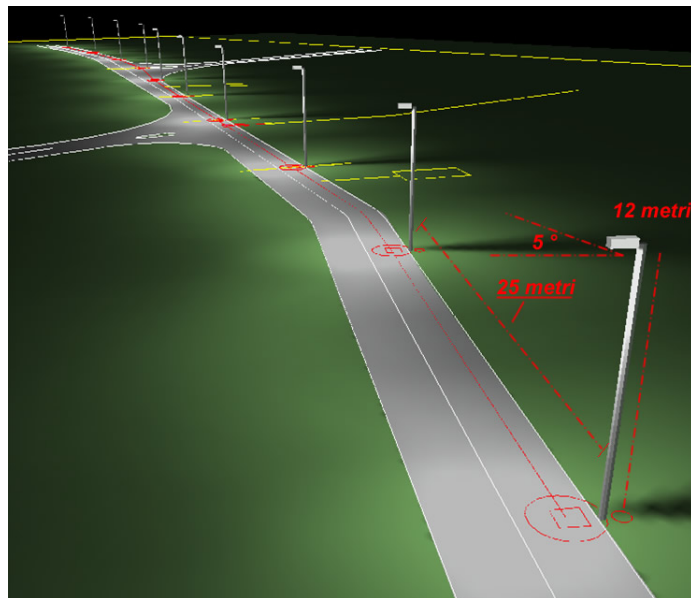
Power supply : 95 – 255 Vac constant current;
Power : 55W – 110W;
Led N° :

- Single Module : 48 led – luminosity 6000 Lumen – Area Lighting 26x12 m;
- Dual Module : 96 led – luminosity 12000 Lumen – Area Lighting 30x20 m;

Reference standard:

Conformity with CEI EN60598 1-2-3-4 : Luminaires. General requirements and tests
 Also meet the general guidelines provided by the following rules:

- UNI EN 11248:2007
- UNI EN 13201-2.



Product Type:
 Single module 55W : 48 led 1W classification ME4b with pole height 9 meters, road width 7 m, 20 m distance for each Lamp

Dual module 110W : 96 led 1W classification ME4b with pole height 12 meters, road width 10 m, 25 m distance for each Lamp

m

| | | | | | | | | | | | | |
|--------|------|------|------|------|-------|-------|-------|-------|-------|--------------------|-----------|--|
| S = 25 | | | | | | | | | | D-S/N 2,5 | | |
| | | | | | | | | | | d-WU/3 3,333333 | | |
| | 1,25 | 3,75 | 6,25 | 8,75 | 11,25 | 13,75 | 16,25 | 18,75 | 21,25 | 23,75 | | |
| 1,6667 | 35,2 | 31,3 | 25,7 | 21,2 | 18,7 | 18,7 | 21,1 | 25,4 | 30,6 | 34 | | |
| 5 | 27,1 | 24,7 | 21,2 | 17,8 | 16,1 | 15,9 | 17,6 | 20,7 | 24,6 | 26,8 | | |
| 8,3333 | 15,9 | 14,3 | 12,6 | 11,5 | 10,8 | 10,9 | 11,8 | 13,8 | 14 | 15,2 | | |
| WL= 10 | | | | | | | | | | | P.to Luce | |

| | |
|--------|----------|
| Emed = | 20,17333 |
| Lmed = | 1,412133 |
| U0 = | 0,53536 |
| Ui = | 0,788169 |
| Ti = | 14,98% |

Iluminamento Medio
Luminanza Media Mantenuta
Uniformità Generale
Uniformità Longitudinale

Rapporto tra luminanza minima e luminanza media su tutta la strada;
 Rapporto tra luminanza minima e luminanza massima lungo la mezzera di ciascuna corsia;

| Class | Luminance of the road surface of the carriageway for the dry road surface condition | | Disability glare Tl in % ^a [maximum] | Lighting of surroundings Sf ^b [minimum] | |
|-------|---|-----------------------------|---|--|-----------------------------|
| | L _a in cd/m ² [minimum maintained] | U ₀ [minimum] | | | U _i [minimum] |
| ME1 | 2,0 | 0,4 | 0,7 | 10 | 0,5 |
| ME2 | 1,5 | 0,4 | 0,7 | 10 | 0,5 |
| ME3a | 1,0 | 0,4 | 0,7 | 15 | 0,5 |
| ME3b | 1,0 | 0,4 | 0,6 | 15 | 0,5 |
| ME3c | 1,0 | 0,4 | 0,5 | 15 | 0,5 |
| ME4a | 0,75 | 0,4 | 0,6 | 15 | 0,5 |
| ME4b | 0,75 | 0,4 | 0,5 | 15 | 0,5 |
| ME5 | 0,5 | 0,35 | 0,4 | 15 | 0,5 |
| ME6 | 0,3 | 0,35 | 0,4 | 15 | no requirement |

^a An increase of 5 percentage points in Tl can be permitted where low luminance light sources are used. (see note 6)
^b This criterion can be applied only where there are no traffic areas with their own requirements adjacent to the carriageway.

Advantages:

Thanks to the patented Lens, the Sud Segnal's Led street light provides significant advantages over traditional sodium vapor lamps, mercury etc., in particular:

- High efficiency with the same power consumption: The LED lamp provides the same brightness level to the ground that a equal sodium vapor lamp, but absorbs only 30% of the power necessary to ensure the illumination required.
- Low light pollution: The LED Street light reduces the emission of light upwards, conveying through the lens the light produced by the LED, just on the street as opposed to traditional armor that emitting in all directions
- Strength and durability: The use of LEDs as a light source, solid-state structure ensures robustness and reliability over time (about 50,000 hours of life). The costs for maintenance of this equipment, are reduced by 90%.

Typical applications

Led street light are suitable for urban and suburban roads, highways, industrial areas, commercial areas, streets, road junctions and tunnels.

Below you can see a tests with pole height 12 meters, 25 meters distance, with led street light 110W mounted with an inclination of 5%