LED LAMP FOR MAJOR LIGHTHOUSES

MLL 1000

The MLL 1000 lamp, developed and **patented by MSM**, is a luminous equipment with the highest LED technology.

While others LED lamps of the market, those are characterised by their use of a **virtual light source**. The light emission is made through prisms to a hyperbole, in such a way that the light source is virtualised in the exact in focus point lens, as a filament or metallic halogen lamp. Thus, the focal distance of the lens is maintained and it can replace any traditional lamp of the market.

Ideal to be installed on classic glass optics, both rotating or flashing lighthouses.

Its main advantages are: its significant energy saving (and consequently the **environment preservation**), its **service life** (up to 100,000 hours) and its **easy installation**, as diesel generator, current inverter system and less capacity batteries are not necessary.

FEATURES

- √ Virtual light focus adapted to Fresnel glass or other material lenses.
- √ Three version of the MLL: 300W, 150W and 75W.
- √ Up to 100,000 hours average life time.
- √ Energy saving up to 60% during the service life of the lamp.
- √ Luminous range reached over 29 nautical miles (T=0,74).
- √ Null impact by a magnifying-glass effect.
- √ Voltage source for on both alternating current (110V/230V) and direct current (24V), allowing installation in lighthouses supplied by solar or wind energy.
- √ Conventional thermal management for the 75W model, and by active refrigeration system for 150 and 300W models; with average life up to 200,000 hours (without moving parts).
- √ High-performance LED power driver, with current regulation and power adjustable by PWM.
- √ Null maintenance.

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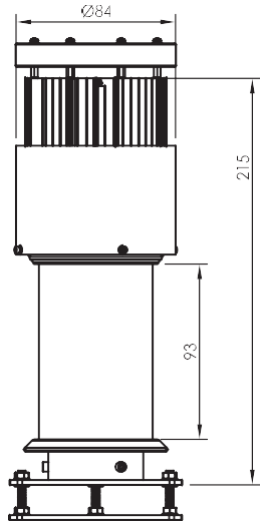
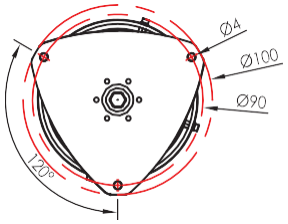




Luminous range according to the type of lens	
Lens type	**Luminous range (T=0,74)**
500mm Horizontal lens	17 nautical miles
4º Order rotating lens	26 nautical miles
3º Order rotating lens	27 nautical miles
2º Order rotating lens	28 nautical miles
1º Order rotating lens	29 nautical miles

Optical features
Matrix high-power LED diode (service life up to 100,000 hours)
NBK7 condenser lens.
Hyperbolic mirror of unalterable stainless-steel.
4000 K colour temperature.

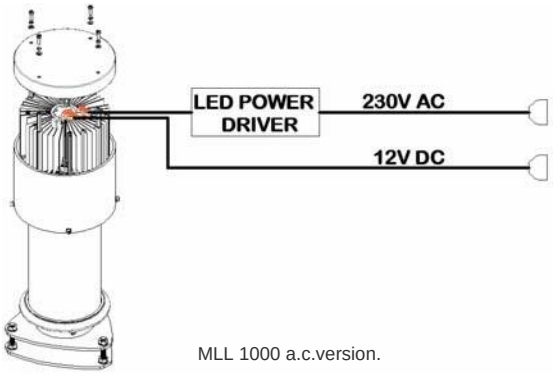
Mechanical features
Triple point anodized aluminium radiator.
NBK7 condenser lens.
Electronic cooling system of 200.000 service-life hours (MLL 150/300W version).
Anti-condensation valve.
Anodized marine aluminium protecting housing.
Adjustable alignment support system.
Focussing accessory.

LED Power Driver features		
Current type	**Alternating current**	**Direct current**
Supply voltage:	100-240 V a.c.	20-36 V d.c.
Frequency:	50-60 Hz	-
LED power driver efficiency:	94%	96%
Protections:	Short-circuit, over-voltage and over-temperature.	

Options
Different colour temperatures.
Lamp Power Unit with oversurge protections, a.c. version or d.c. version available.
Automatic Control Unit with alarm outputs, configurable by customer.

Model	Power	Luminous flux
MLL 3000 (*)	300 W	36.000 lm
MLL 1000	150 W	23.000 lm
MLL 750	75 W	11.000 lm

Other configurations available under request.
(*) Up to 50% duty cycle only.



MLL 1000 a.c.version.