

Cortem Group Lighting fixtures with LED technology for areas at risk of explosion: innovative and enhanced EVL series

The continuous innovation processes and technological updates for the EVL lighting fixtures series makes them a safer and more performing product

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In a rapidly evolving scenario such as the LED technology, the process of developing new products and the innovation and updating of the existing ones for continuous performance improvement are a crucial element for the Cortem Group.

The EVL series of LED lighting fixtures, launched by Cortem Group in 2015 and available in four sizes, has been innovated and enhanced to offer an even safer and more performing product.

The explosion protection method has been improved with the 'Ex op is' certification, the so-called optical safety governed by the IEC 60079-28 Ed. 2 standard which concerns the Ex world only (such as, for example, the certifications ATEX / IECEx).

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Specifically, the standard identifies two parameters that measure the hazard of a light emission: optical power (mW) and optical irradiation (mW/mm²). In the case of classified areas, an optical source can represent a trigger when it exceeds certain values of power and collimation of the beam. The "op is" protection is applied when the radiation is not



EVL lighting fixture

confined in a closed space, but exits the device (as in the case of the light beam coming out of the lighting equipment) and has the purpose of ensuring that, even in fault conditions, the optical power emission or the optical irradiation emission does not exceed the expected levels.

"This result has been achieved - explains Cortem Group R&D Manager Cristiano Decorte - thanks to the use of specific multiled board plates and the implementation of particular electronic and mechanical safety measures. The new multiled board plates offer better control of heat dissipation, excellent mechanical strength and a wider light emission area which allows greater illumination and reduced glare".

All models were also subjected to new explosion tests which allowed to extend the range of the ambient temperature to $-40^{\circ}\text{C} + 60^{\circ}\text{C}$ and to reach, with gas group IIB+H₂ and IIC, temperature classes colder (T5) for some models.

As regards the electrical and photometric characteristics, the choice of supply voltages and powers has been expanded to meet all possible application requests: the supply voltages range go from 12 to 277 V for each of the 4 sizes, while the powers available start from 20W up to 220W, with steps of 10W and 20W. All this is reflected proportionally into different lumen outputs ranging from a minimum of 1,700lm to a maximum of 21,000lm.

In the technological world, the state of continuous improvement is called permanent beta mindset, that is, a state of permanent beta in which the improvement of the product is constantly pursued in order to increasingly satisfy customer requests and increase the value offered to the market. The EVL series innovation project also included the development of a transportable version with an electronic driver, to be used mainly in inspection and maintenance activities on industrial plants and tanks, and a model specifically designed for a rapid and a timely replacement of the old generation discharge lighting fixtures installed directly on a pole.

From a mechanical point of view, the EVL series is characterized by a patented design: the body, made of aluminium alloy, is equipped with fins that act as a heat sink allowing a fast and effective dispersion of heat generated by the normal operation of the LED, as can be seen from the thermal imaging.

Following a very brief initial period, the lighting fixture reaches thermal stability. This image shows the detected heat. With the ambient temperature at 18°C (as shown by the blue background) the LED lamp

barely touches 42° at the hottest point. This thermal performance is tangible proof of the high efficiency of LED lamps as a source of light.

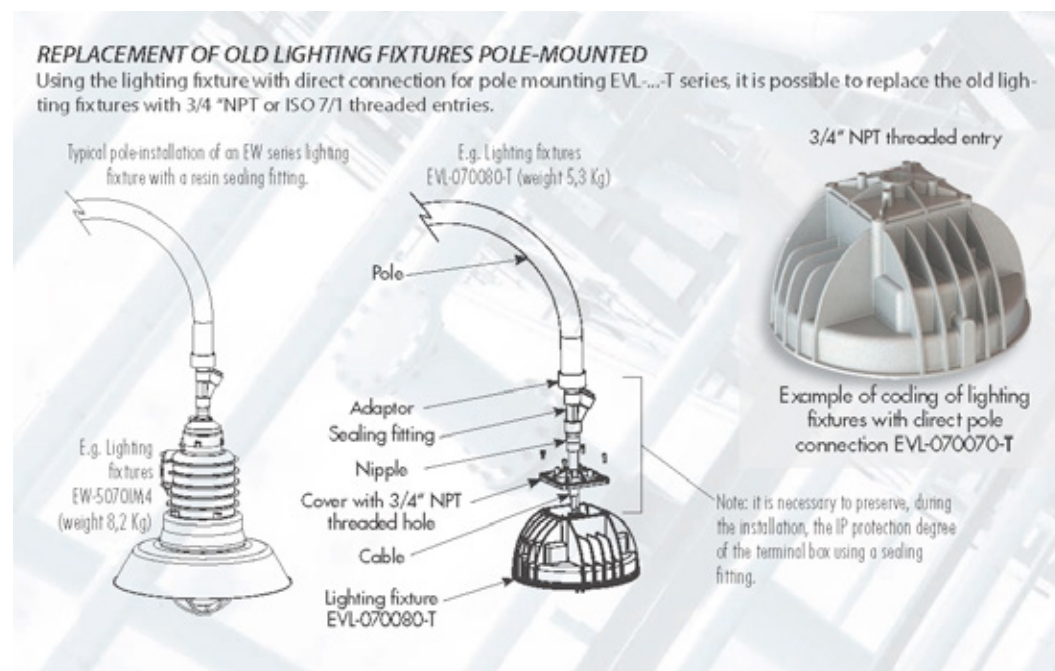
The EVL series innovation project also included the development of a transportable version with electronic driver

The geometric conformation of the cooling fins was also designed with the objective of minimizing the deposit of combustible dust, allowing the self-cleaning of the lighting fixture by air or water present in the environment. Furthermore, thanks to the absence of UV emission, there is no ionization of the air particles around the lighting fixture, an intrinsic characteristic of LED technology which limits the attraction of dust and insects.

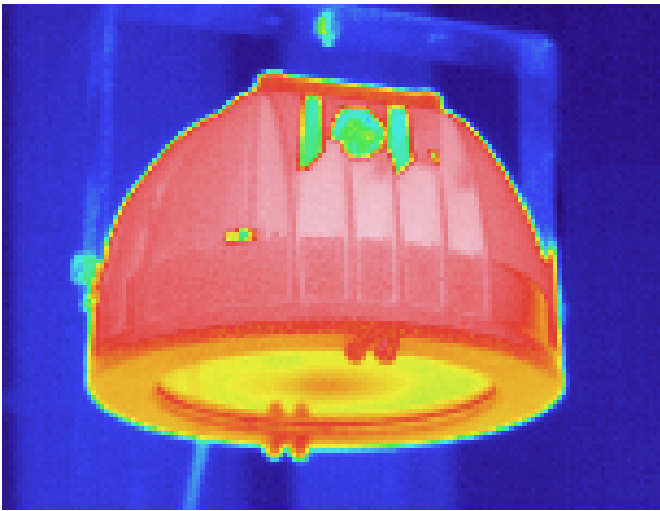
The design of the lamp body, in addition to being functional to the duration of the system, gives the equipment very high light efficiency in relation to the maximum surface temperature (T), a very important factor for the installation of lighting fixtures in places with explosion hazard, containing gas or dust at low ignition temperature.

A further saving is obtained thanks to the fact that, while discharge lamps require a preheating time for their complete ignition and, for this reason, often remain on 24 hours a day, the EVL series lighting fixtures, featuring an immediate ignition (Instant Restrike), can be effectively connected to automatic ignition systems in case of low light, allowing the use only in the periods of time really necessary and, consequently, further savings in energy costs.

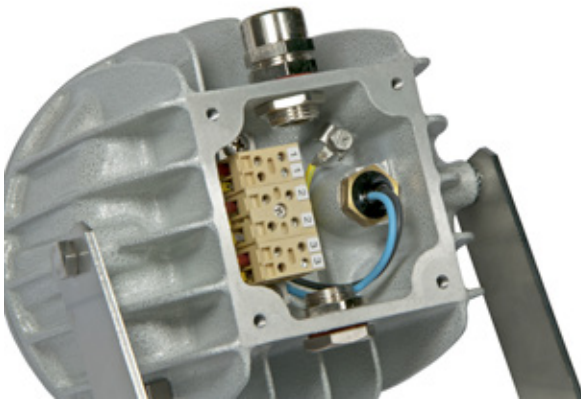
The electrical connection is easier thanks to a 'Ex e' terminal housing which allows the entry with a 'Ex e'



EVLT model



Thermal imaging



Terminal board enclosure



Cable Entry

cable gland (no barrier). In addition, an opposed plugged hole permits the through wiring connection. EVL series LED light source allows a better identification of colors of the objects than traditional sodium vapor lamps which have a low color rendering index (CRI = 25). The EVL CRI typical value is CRI = 80. The standard color temperature is cold white, other color temperatures can be supplied on request. The EVL series represents the LED alternative for all

those areas where low and medium power discharge and incandescent lighting fixtures up to 400W were used. For example, the EVL-70 series, which has a consumption of 55 W, is able to replace a 100 W metal and sodium halide lighting fixture, a 200 W mercury vapor lighting fixture and a 500 W incandescent one. Finally, the EVL series has a 115° light beam aperture, falling within the limits dictated by the most recent light pollution standards.



Francesca Merola

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Cortem products and, along with the R&D department, works to communicate their pluses in the best way.