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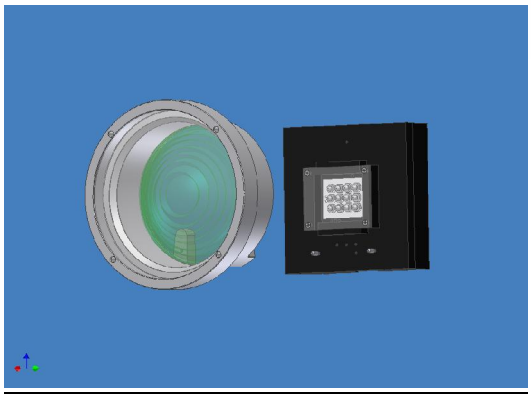
MA-IFF Railway and Road LED Lightsource for Signals



Replacement of the public road light signals of the railway level crossings with MA-IFF type bulb replacing LEDs.

There has been big demand from the national railways for the LED light sources with higher level services and longer lifetime than those of bulbs which are being used currently, taking into account the reduction of operational and fault-correction costs and in order to of increase the safety of the railway level crossings as most important points of view.

The basic purpose was to realize a light source whose installation and operation does not need changing the lamp-head, furthermore, it is not necessary to transform the currently used interlocking light electric circuit within the relay unit, and in some applications the modified light circuit solution of the already approved and implemented semiconductor-based light source should be suitable for the operation of the MA-IFF LED light source.

Description of the realized LED light source

MA-IFF type LED light source is applied in the public road light signals of the level crossings.

The development of the semiconductor based light-emitting diodes enabled to produce reliable high power light sources with the application of few individual LEDs, in this way the highest efficiency could be achieved.

MA-IFF type LED light source serves for the replacement of the bulbs and they are quite compatible with the light circuits of the road signals of the light barriers.

The light electric circuit need not to be modified, the coil of light checking relay should not be changed.

The optics of the public road signal shall not be changed because the new LED light source is inserted in the place of the bulb socket.

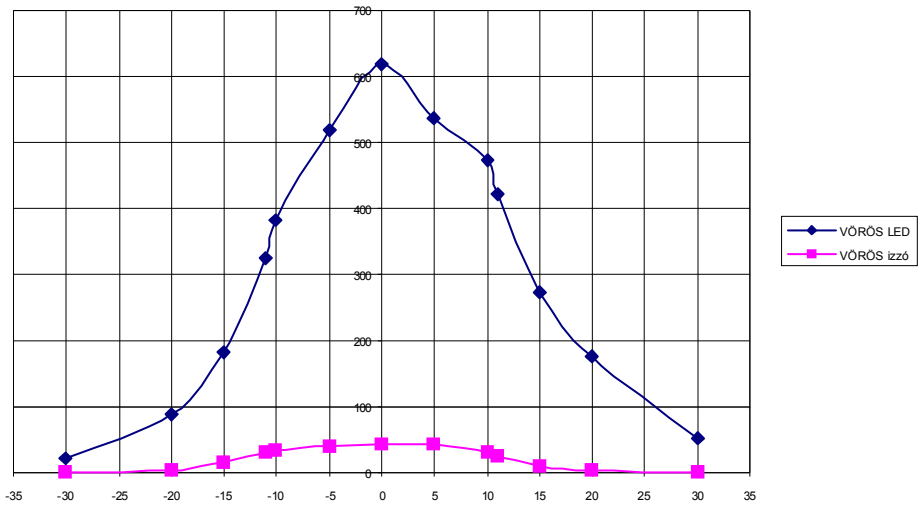
The new LED light source complies with the light-technical requirements in the whole operating voltage and temperature range.
The panel including the LEDs is mounted on the cooling block. It is equipped with an acrylic protection plate on the side of the optical lenses to prevent impairments. If the optical lenses are broken, the LED light source continues giving right signal aspect from behind the acrylic protection plate.

Special features of the MA-IFF LED light source:

1. The electric circuit is protected by means of a suppressor diode against transient interferences of the input voltage.
2. In case of permanent overvoltage the LED light source is switched off by itself by disconnecting the light electric circuit.
3. In case of short-circuit failure of one of two serially connected LED light sources the other LED light source switches itself off by disconnecting the light electric circuit (monitoring each other)
4. The MA-IFF LED light source switches itself off by disconnecting the light electric circuit, if the intensity of the emitted light is reduced below 100cd as minimum value in the standards.

Comparison of red colored light sources by light distribution:

Light intensity measured in cd in the function of horizontal angle of dispersion



The light intensity of red LED light source (617cd) is fourteen times higher (43cd) than that of bulb, measured in optical axis. The values of LED ±15° (183-273cd) surpass the values of the bulb by four times, measured in the maximum optical axis!

Advantages:

- **Lifetime of the LEDs is more than 15 times higher than that of bulbs (minimum 40,000 hours)**
- **LEDs are to be replaced at most once in 5 years, while the bulbs to be replaced approximately at least 20 times**
- **The costs of changing the LEDs are one-twentiest of the costs of bulbs during 5 years**
- **The LED unit can be inserted directly into the conventional lamp head without modification of the light electric circuit or interlocking equipment**
- **It has individual failure localization, therefore there is no need for regular supervision measurements**
- **The operational costs of the equipments are reduced promptly after the installation; therefore, the investment costs are covered within 1 year.**

The new MA-IFF type LED light source gives possibility for large reduction of the maintenance costs by its much longer lifetime and several error detection services.