

LED Contactless System

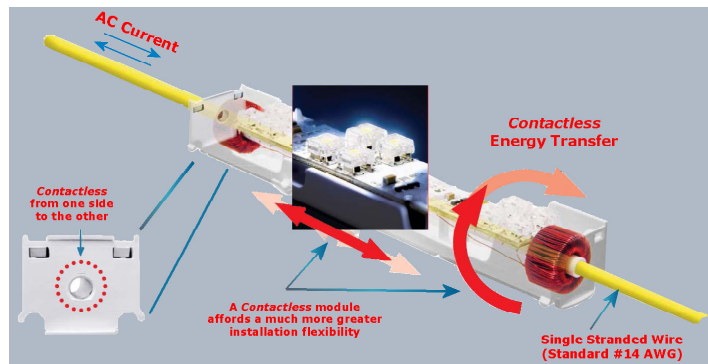
In the Neon signage application, the core & coil transformer is the most utilized form of power supply, reputedly known for its poor energetic efficiency. For example, a white neon tube driven at 30 mA and giving an intensity of 1600 lux requires a consumption of 3.84 W/foot, with a power factor of 0.5. To obtain the same lighting level, the EMD's LED *Contactless* system would consume only 3.07 W/foot, resulting in an energy saving of 20% and a power factor increased to 0.9. For red lighting applications, the energy economy is even more remarkable, reaching approximately 45%.

With thousands and thousands signs installed in North America, the replacement of the old-fashioned electromagnetic lighting power technology would represent an astounding energy saving for years to come. The electric sign consumption per year is estimated at 11.6 TWh/yr, the neon installed base is 42% for a total consumption of 4.87TWh/yr. If we can apply our technology to only 5% of that consumption, this would represent a saving of 243 MWh/yr.

Yet, we see today more than 100 different LED systems on the signage market, unfortunately all noted for their very low energetic efficiency. This poor achievement stands on the fact that the current supplying LEDs is controlled by a simple resistor or regulator, a technology that engulfs up to 50% of the input power in the production of heat instead of light.

The unique EMD LED Contactless System (patent pending)

Based on the concept of electromagnetic coupling (see figure), the LED *Contactless* system distributes the lighting energy (AC current) directly to the LED modules, without any physical contact. A unique AC current loops through all LEDs on a single stranded wire, regardless of their intensity, color, number and voltage. The adaptation transformer in each LED module drives the LEDs in DC current (after rectification). The power supply (not shown in opposite figure), a Class-2 type, achieves more than 90% energetic efficiency.



Two views of the EMD LED *Contactless* System concept: (Above) illustration; (Below): Block diagram

LED modules can be freely positioned on the sign circuit. No ballast resistor or regulator is used, so that most of the energy is directly converted in the radiant luminosity of the LEDs!

A testimonial evidence of the system

A telling evidence of the outstanding energetic efficiency of the LED

Contactless system was seen last summer at the Montréal Botanical Garden (Qc, Canada), where the award-winning event *The Magic of Lanterns* (edition 2008) was held. EMD Technologies dramatically improved this annual realization by lighting the Chinese lantern sculptures using its new system and consequently saving about 85% of the energy costs as compared to the incandescent bulbs.

For the overall installation, the figure goes like this: 61kW for the light bulbs; 9.1 kW for the *Contactless* LED system. Testimony of this realization can be seen at: <http://www2.ville.montreal.qc.ca/jardin/en/propos/lanternes.htm>