

# DMR.730 TRAILING EDGE DIMMER

Designed & Manufactured  
by ELECTRON SA



*SMRD* Technology

## DMR.730 FLICKER FREE TRAILING EDGE DIMMER *Unaffected from mains fluctuations*

Specially designed for  
dimvable 230VAC LED lamps.

The only dimmer which  
achieves stable output voltage,  
unaffected from mains fluctuations.

Output remains stable  
even at 230VAC, in power supply  
voltage range from 173VAC to 265VAC.

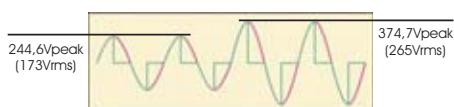
### Mains fluctuation immunity

The light intensity adjustment in a common flicker free dimmer is usually based on IGBTs (Insulated Gate Bipolar Transistor). These dimmers have the ability to vary the conduction angle of the power supply sinusoidal voltage so that regulation of brightness variation of the lamp(s) is achieved. When IGBT is in conduction state it acts as a switch, and consequently the supply voltage is conducted at the dimmer's output. This means that any fluctuation in the mains voltage is conducted to the lamps and the result is the variation of the lamps' luminosity. Thus, these dimmers are flicker-free concerning their electronic circuit, but the lamps are flickering because of the dimmer's weakness to control the fluctuations of the mains system.

The new SMRD (Switch Mode Regulated Dimmer) technology monitors the mains voltage and stabilizes the output voltage so that this remains stable and unaffected from the network's fluctuations, thus results in the stability of the lamp(s) brightness.

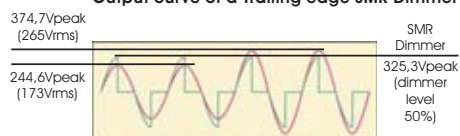


Output curve of a common Trailing edge flicker free dimmer



When the IGBT is in conduction, the dimmer's peak voltage (green curve) is about the same with the mains peak voltage (red curve). Consequently, the voltage that is conducted to the lamp(s) is proportional to the mains' fluctuations.

Output curve of a Trailing edge SMR Dimmer



The peak voltage of the SMR Dimmer (green curve), is stable irrespectively of the mains peak voltage (red curve). The amplitude of the mains' fluctuation could be from 173V to 265V.



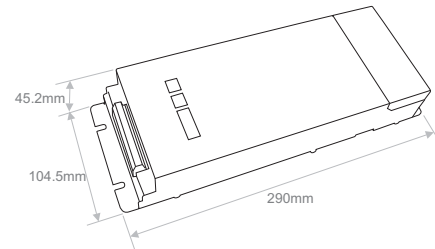
### True output regulation

Some dimmers available in the market achieve voltage stabilization by regulating the conduction angle. With this method the RMS voltage can remain stable, however there are three disadvantages:

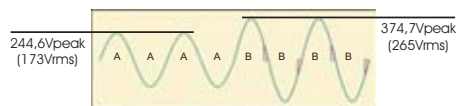
- 1) Mains voltage must be always higher than the output voltage.
- 2) By changing the conduction angle, brightness is affected because the LED Lamp(s) luminosity regulation is depended on the conduction angle of the dimmer.
- 3) When the dimmer is on at full (conduction angle 100%), there is no possibility to further increase the conduction angle in case of a voltage drop from the network.

**SMR technology maintains the output voltage stable with no need of higher mains voltage and without changing the conduction angle. This means that even if the dimmer is at 100%, the output remains at full (230V) in power supply voltage range from 173V to 265V.**

SMR Technology

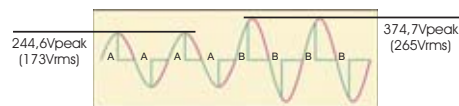


**Failure of RMS output voltage stabilization, by changing the conduction angle, when the dimmer is at full (100%).**



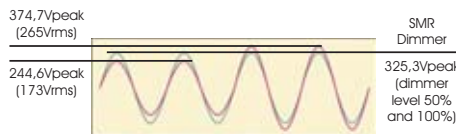
A: Conduction angle 100%. RMS voltage is less than 173Vrms, not 230Vrms.  
B: Smaller conduction angle for output 230Vrms. The supply voltage must be higher than 230Vrms.

**Stabilization of RMS output voltage by changing the conduction angle.**



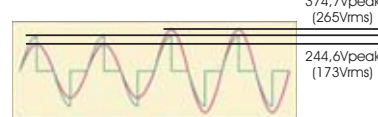
Changing angle A to angle B to maintain the same RMS output voltage, results in changing the brightness of the lamp.

**Stabilization of output voltage at 100% of the SMR dimmer**



The lamp is supplied with stable voltage even if the mains voltage drops at 173V.

**Stabilization of output voltage at 50% of the SMR dimmer without changing the conduction angle**



The lamp is supplied with stable voltage and stable conduction angle.

### More features of the SMR Dimmer:

#### Power Factor

LED lamps but also CFLs (Compact Fluorescent Lamps) are usually loads with low power factor ( $\cos\theta=0.55-0.75$ ). Independently from the lamps' power factor, the new SMR dimmer consumes energy with power factor  $>0.98$  (for output level 100%), without affecting the network.

#### Lamp protection

Due to the special electronic circuits and stabilization the output voltage is always steady and free from spikes and over-voltages protecting the lamps even from complete failure.

#### Dimming law correction

With the use of two trimmers the dead fields, that usually LED and fluorescent lamps have, are eliminated. The first trimmer is used for the minimum and the other one for the maximum brightness of the lamp. In this way the controller works correctly when adjusting the lamps' brightness.

#### Master Slave operation

The new SMR dimmer can work as master, controlling multiple SMR dimmers connected at its DMX output. With this feature, as many SMR dimmers as the user likes can be controlled from one controller.

#### CFL ignition

CFLs (Compact Fluorescent Lamps) in order to ignite need operating voltage of more than approximately 50%. Thus, in order to turn on a CFL at 30% for example, the user should first adjust the dimmer over 50% and afterwards dim it at 30%.

The new SMR dimmer is capable of providing a pulse of 100% of the output voltage, for 1sec automatically, in case we need to turn on the lamps at percentages less than 50%.

#### Control inputs

The new SMR dimmer incorporates both DMX-512 and analogue inputs. At the analogue input the user can connect 0/10V, or 1/10V, or rheostat 100Klog, or button for ON - OFF and dimming, or UP/DOWN button for ON - OFF and dimming.

#### PWM signal output

The new SMR dimmer incorporates PWM signal output, providing the capability of driving constant voltage and constant current converters of ELECTRON SA. Thus, with one controller the user can control multiple types of lighting fixtures.

# DMR.731

## TRAILING EDGE DIMMER

Lighting Management, Power Supplies & Controllers 

  
Designed & Manufactured  
by ELECTRON SA



## DMR.731

### FLICKER FREE TRAILING EDGE DIMMER

#### Economic solution for controlling:

- Dimmable LEDs 230V.
  - Dimmable CFLs .
  - Trailing edge dimmable Electronic Transformers.
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- Handles great inrush currents.
  - Lamps connected up to 350W.
  - Dimming Law Correction eliminating dead fields of the lamps.
  - Master - Slave operation for controlling multiple Dimmers with one controller.
  - CFL ignition.
  - DMX-512 input.
  - Analogue input (0/10V, 1/10V, rheostat 100Klog, button, UP/DOWN button).
  - PWM signal output can drive ELECTRON SA constant voltage and constant current converters.

**Output power 350W**  
**Controlled by IGBT**

