

BI-POWER LEVEL CONTROL GEAR UNITS FOR DISCHARGE LAMPS

1. OVERVIEW

Fundamentally it consists of an electromagnetic reactance destined to obtain an energy saving, allowing that, at certain hours of the night, the level of illumination of a concrete installation can be reduced.

These reactances are constructively characterized for having two windings in series. One of them (the main one) provides the current and nominal power to the lamp. When it is desired to obtain an illumination reduction, the other winding is connected so that it increases the impedance, diminishing therefore the current and power in the lamp, which diminishes the luminous flux (see figure 1).

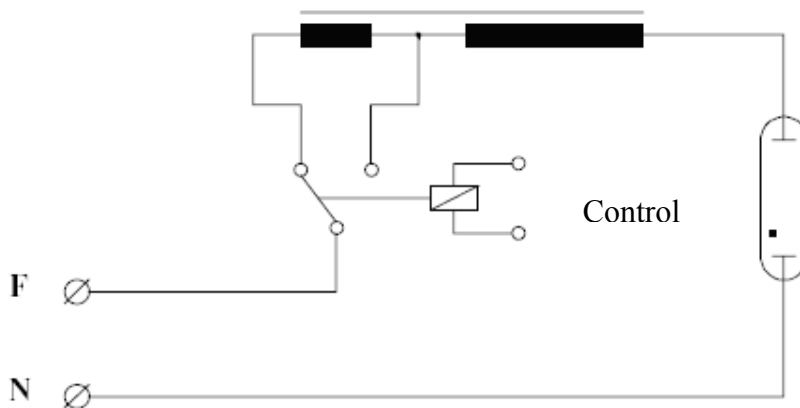


Fig. 1

LAYRTON products totally cover the possibilities of the bi-power level control gear. They are mounted in a single block of easy adaptation to illumination plates and with all the internal connections necessary to facilitate the installation in its corresponding application.

In bi-power level control gear units LAYRTON, a reduction of power is agreed according to the maximum admissible by the lamp manufacturers and it is as follows:

- Between 35% and 40% of the total power for high pressure mercury vapour units.
- Between 40% and 45% of the total power for high pressure sodium vapour units.

Units for metal halide lamps are not manufactured because these do not admit power reduction.

There is also some type of sodium lamps that don't allow current variations, such is the case of the lamps of high performance, reason why is always important to make sure that the lamp being used is compatible with the unit and with the utilization that we want to give to it.

The bi-power level control gear units have normally built-in in a single block:

Bi-power level reactance

This will be, as has been explain previously, a reactance of normal impact (shock) to which a winding in series has been added. The union between both windings is accessible by means of a plug connected to a connection card.

Capacitor (or capacitors) for the correction of the power factor.

This correction tends to be done normally by means of a single capacitor, although there are customers in particular that can request the double compensation (different for each level of power) for which will be necessary to connect one or two capacitors when connecting the maximum or minimum level of illumination.

Starters of ignition (for high pressure sodium lamps).

They have the mission to provide the impulse of voltage necessary to cause the ignition of the lamp. They could be of type superposition or reactance dependent.

Power level commutation relay.

It will be of one or two contacts according to whether it is a simple or double compensation unit.

2. POWER LEVEL EXCHANGE SYSTEMS

2.1 WITH EXTERNAL LINE OF CONTROL

By means of a clock located in the manoeuvre board we can make the commutation of nominal to reduced level and vice versa, programming the clock appropriately.

This device will normally give way to a voltage of 220V that will be applied to the relays throughout a line of control that will have to cross the installation point by point.

Advantages:

- With a single clock we can control the change of power level of the whole or part of the installation.
- We can pass from one level to the next as many times as we program it.
- The modification of the operating times is simple, is enough with modifying the clock programming.

Disadvantages:

- The utilization of a line of control implies installation difficulties when it is desired to incorporate it to an existing lighting system.

2.2 WITH TIME-LAG RELAY (LAYCONTROL).

This application consists of connecting a time-lag relay (timer) in every bi-power level unit. This relay is programmed from factory to 4hrs. 30 min. \pm 6% (other programmings can be established under request).

Once the programming time has passed, counting from the beginning of the connection of the installation, the relay acts on every unit exchanging the level of power from maximum to minimum. The installation stays permanently in this power until it is disconnected from the general network.

Advantages:

- It can be applied in already made installations, especially in those cases where the line of control presents accomplishment difficulties.

Disadvantages:

- Every bi-power level unit needs to take a time-lag relay (LAYCONTROL).

- In every level change we must admit a tolerance in the time of $\pm 6\%$ (not all the points of light change at once).
- In case of power cut, the programming of time returns to the beginning.
- The times of commutation of the operation levels stay fixed to the initially anticipated one, and no longer admit any other type of programming.