

# MULTI-VOLT LOCKING-TYPE PHOTOCONTROLS

**M**ulti-volt controls were created in response to the market requirements many years ago. There are a wide range of voltages that can be encountered when performing lighting maintenance (120, 208, 240 & 277 volts). It is the norm, not the exception, to have a wide variety of voltages to contend with. Inventory on the truck and in the warehouse is tough to track and requirements even harder to predict. These inventory problems could be greatly reduced by having one locking-type control that covers line voltages from 105 to 305. Linemen can carry one control and be prepared for whatever voltage they encounter.

The electrical distributors also like the “one control”, to suit all voltages, keep

inventories tight, simple, reduce call backs and avoid general application mistakes.

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## **OLDER TRADITIONAL THERMAL AND ELECTRO-MAGNETIC DESIGNS**

With older controls of thermal and electromagnetic

design, the task of covering a wide voltage range didn't come without performance compromises. Compromises were made in the form of light level accuracy and excessive power dissipation. For these older designs, on and off operating light levels are a function of line voltage. The result being higher turn on light levels and longer burning hours at the 120 volt level, and early on levels or cycling potential at high voltage end. Because these designs have inherently higher power consumption, the problem of power dissipation is also compounded.

Because Power is a function of the voltage squared ( $P=V^2/R$ ), when the voltage doubles, the power increases 4 times. A control rated from 105 to 305 VAC would have

8.44 times the power to dissipate at the 305 volt level as compared to the 105 volt level.

Energy is expensive, the less efficient the control's ability to switch the real power consumer (the light fixture) the higher the cost to the consumer. One can easily calculate the excess energy cost by taking the increased lamp burning time over a more efficient electronic control x the wattage x the number of lighting fixtures on system x the cost per kW and you will be amazed at how the dollars can add up.

## **ELECTRONIC CONTROLS**

The development of the electronic photocontrol greatly enhances the multi-volt control performance. A solid-state electronic design circuitry allows the multi-volt control to cover the wide range of line voltages without having to compromise the light level accuracy. This means a control that switches on at 1.0 and off at 1.5 foot-candles will do so at 120, 240 or 277 volts. Because the electronic design consumes less power,

the effect of increased power at the higher voltages is minimized. In addition the sensor sees a maximum of less than 2 milliwatts of power for the brief period transition from light to dark, and a third of a milliwatt during night time, both levels are independent of line voltage and 100's of times below its power rating.

The Precision Model ECDV is designed to give long term maintenance free multi-volt performance.

When specifying an electronic multiple voltage control, one should require the following:

1. The control must meet all the ANSI C136.10-'96 requirements.
2. The voltage operational range should cover from 105-305 volts, 60 Hz.
3. Contact chatter should not exceed 5 milliseconds (chatter is defined as a make & break of the load circuit).
4. Surge protection should be of the MOV type (metal oxide varistor) of not less than 320 Joules and 6500 amps.
5. Control should have an instant turn on and a minimum of 2.0 seconds delay on the turn off function.
6. Light sensitive element should be either the sealed silicon or CdS type.
7. Turn on light level should be a minimum of 1.5 FC @ 120 VAC and not turn off more than one and a half times the turn on light level. These levels should be the same across the full voltage range.
8. Recommended Precision Model #ECDV-AP-TD.

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