TROPO OUTPUT VOLTAGE RANGE

INTRODUCTION

This application note has been written to assist with selection of ENEDO TROPO Series drivers. Since there are many configurations of LED designs, care must be taken to ensure that the operation window for the TROPO series is not violated. It is apparent that when the input of TROPO is dimmed with a line voltage dimmer, the output current is adjusted. As the output current reduces, so does the forward voltage of the LED(s) connect to the output. Care must be taken when selecting a TROPO driver to ensure the output voltage is always within the operating voltage range. This includes when being dimmed.
This application note will address the operation of TROPO drivers with respect to the output voltage operation range.
It is suggested to review ENEDO TROPO **Application Note # 1**, Line Voltage Dimming of TROPO Drivers, prior to this application note.

TROPO OUTPUT VOLTAGE RANGE

TROPO drivers include 3 standard models. The output of the driver is constant current regulated to a factory set point. The drivers also have a specified output voltage operating range that must be met under all conditions, including when being dimmed. **Figure 1** is a table that summarizes the models, the output current setpoint and the operating voltage range for each model.

Model Number	V_{OUT} Min* (Vdc)	V_{OUT} Max* (Vdc)	I_{OUT} Set (mA)
RLDD015H-350	24	48	350
RLDD015H-350H	12	21	350
RLDD015H-700	16	24	700

Figure 1

The V_{OUT} Min and V_{OUT} Max must be met under all conditions of the driver and LED assembly, including when being dimmed and when the fixture is at maximum operating temperature.

Failure to meet this requirement may result in poor performance of the end product. Typically, this will result in some flicker at the low end of the dimming range. The TROPO driver and LED will not be damaged under a low output voltage condition.

LED VOLTAGE RATING

Unfortunately, most LED manufacturers do not provide detailed information regarding the forward voltage at reduced currents and temperatures other than 25°C. Therefore, laboratory measurements and calculations should be made to ensure the minimum voltage is maintained under all anticipated operating conditions.

TYPICAL NUMBER OF LEDS SUPPORTED

Each standard TROPO model will perform with a certain number of LEDs in a string. The following table summarizes this data. This is based on a broad range of standard individual LEDs from various manufacturers. This list does not imply TROPO will operate properly with the indicated number of LEDs under all conceivable operating parameters and from every LED manufacturer, but should serve as a guide in determining the TROPO driver possible for a particular application.

Model Number	V_{OUT} Min* (Vdc)	V_{OUT} Max* (Vdc)	I_{OUT} Set (mA)	Suggested # of LEDs in a string
RLDD015H-350	24	48	350	10 to 13
RLDD015H-350H	12	21	350	4 to 6
RLDD015H-700	16	24	700	4 to 6

Figure 2

If an application does not meet the above requirements, contact ENEDO to discuss a modified standard product. It is possible to modify the TROPO driver to operate at lower currents to permit a wide variety of possible driver models.
In addition, if the application will utilize an LED chip assembly, consult the factory for possible drivers for the application. There are a number of drivers already designed to operate with Bridgelux and Citizen LED chip assemblies.

NOTE: SOME STANDARD MODELS ARE BUILT TO ORDER. PLEASE CONSULT THE FACTORY TO CHECK AVAILABILITY.