



the Power to Create Better Light™

BUYERS GUIDE FOR TYPE C DRIVERS

Programmable vs. Field Adjustable LED Drivers



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What are the different TLED system types?

There are three basic types of linear LED tube systems. UL standards have defined the three basic system types as Types A, B, and C:

TYPE A - Ballast Compatible

Type A LED tube systems consist of a tube lamp that operates directly off of the fluorescent ballast. These direct replacements for fluorescent lamps are often called 'ballast-compatible' or 'plug-and-play tubes.'

PROS:

- Lowest initial installation cost, plug & play, no rewiring
- Fixture safety certification preserved
- Available with dimmability, emergency back up and dimming is possible
- Upgradable to Type C with external driver

CONS:

- Ballast compatibility concerns: starting, noise, flicker.
- Arcing risks
- Ballast life / maintenance issues
- Arcing concerns due to ballast high OCV
- Tombstone condition and compatibility issues
- Lower system efficiency due to unnecessary ballast losses



TYPE B - Line Voltage / Ac-Direct

Type B LED tube systems consist of a tube lamp that operates directly off of line voltage, typically 120VAC. These LED tube lamps require that the fluorescent ballast be bypassed, and line voltage be wired to the tombstones / lamps. Type B are often called 'AC direct-input' or 'line voltage tubes.'

(Single ended input and double ended with mechanical switches)

PROS:

- Eliminates legacy ballast failure

CONS:

- Requires rewiring / ballast bypass
- Double ended input with mechanical switches can create loose lamp connections with sockets
- Double switched type are more difficult to install
- Sometimes must change sockets
- Difficult to incorporate dimming



What are the different TLED system types? *continued*

TYPE C - External Driver

Type C LED tube systems consist of tube lamps and a separate external LED driver. These systems are often called 'external driver' or 'separate lamp and driver.'

PROS:

- Highest efficiency
- Eliminates legacy ballast failure
- Easy dimming and other lighting control functions
- Programmable for various light levels

CONS:

- Highest costs
- More components to fail
- Most time to install



TLED system variations

A couple additional TLED system variations have become available in recent years. Hybrid A/B systems are tubes that initially are fluorescent ballast-compatible, and later when the fluorescent ballast fails, the ballast can be bypassed to run line voltage to the tombstones / lamps.

Another recent variation is Double-Ended Input Type B Tubes:

DE - DOUBLE ENDED INPUT

(A New Variation of Type B)

PROS:

- No need to change sockets
- No arcing issues
- Easy to bypass ballast wiring and no short circuit risk
- One component system for easy maintenance
- Backward compatible with single-ended Type B retrofit

CONS:

- Hard to incorporate 0-10V dimming
- Requires rewiring / ballast bypass
- Higher initial lamp cost

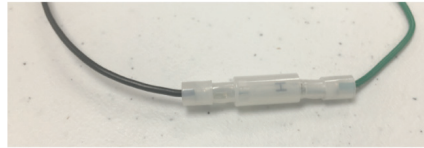


Programmable & Field Adjustable Type C Drivers

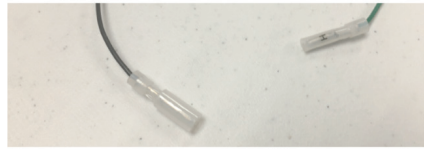
The Programmable & Field Adjustable Type C Drivers are designed to operate Espen's CoreTech Type C TLED lamps (T5 or T8), as well as its VersaLinear retrofit modules. They come in 1-2 lamp models and 3-4 lamp models. These new drivers are constant current, 2 or 4 channels, universal voltage (120-277V), and dimmable. These driver lines are damp location listed and come with a 60,000 hour rated life and 5 year warranty.

The non-programmable drivers are field adjustable for high and low current settings. These allow the installer to select for either maximum efficiency or maximum light output. The programmable Type C drivers can be programmed anywhere within a current range, allowing the facility manager to optimize their desired trade off for efficiency and light output.

The following pictures show how field adjustable drivers are set to either 300mA or 360mA drive current:



Low Drive Current (300mA)



High Drive Current (360mA)

Programmable and Field Adjustable Driver Features

MODEL	PROGRAMMABLE DRIVERS	FIELD ADJUSTABLE DRIVERS
VPL50	Order suffix is -XXX	Order suffix is -030/036
	300 – 600mA drive current range	300 <u>or</u> 360mA drive current settings
	Use with 1 or 2 Espen Type C LED T5 or T8 Lamps (CoreTech) or LED Modules (VersaLinear)	Use with 1 or 2 Espen Type C LED T5 or T8 Lamps (CoreTech) or LED Modules (VersaLinear)
	50W Max	33W Max
	Constant Current	Constant Current
	2 Channels	2 Channels
	Universal Voltage (120 – 277VAC)	Universal Voltage (120 – 277VAC)
	0-10V Dimmable	0-10V Dimmable
	Suitable for Damp Locations	Suitable for Damp Locations
	5 Year Warranty	5 Year Warranty
VPL100	Order suffix is -XXX	Order suffix is -030/036
	200 – 500mA drive current range	300 <u>or</u> 360mA drive current settings
	Use with 3 or 4 Espen Type C LED T5 or T8 Lamps (CoreTech) or LED Modules (VersaLinear)	Use with 3 or 4 Espen Type C LED T5 or T8 Lamps (CoreTech) or LED Modules (VersaLinear)
	80W Max	66W Max
	Constant Current	Constant Current
	4 Channels	4 Channels
	Universal Voltage (120 – 277VAC)	Universal Voltage (120 – 277VAC)
	0-10V Dimmable	0-10V Dimmable
	Suitable for Damp Locations	Suitable for Damp Locations
	5 Year Warranty	5 Year Warranty

Choosing between Programmable & Field Adjustable

Remember to only operate Type C TLEDs (or retrofit modules) on Type C drivers. Espen Type C lamps are the CoreTech™ family of TLEDs. When the installation will be with T8 TLEDs, either the programmable or field adjustable drivers could be selected. In the T8 scenario, most end users will be better off selecting the field adjustable driver because of its lower cost and the simplicity of the drive current wiring options (no programming required). The VPL50s operate 1 or 2 lamps, while the VPL100s operate 3 or 4 lamps. This is true for both programmable and field adjustable drivers. Both programmable and field adjustable drivers are 0-10V dimmable.

T8 lamps are run at 300mA for 1800 lumen Espen type C lamps and 360mA for 2200 lumen Espen type C lamps. Therefore, if the field adjustable driver is selected, both lumen option lamps can be accommodated. The wiring images above show the simple process for installing the drivers at 300 or 360mA drive currents. For the programmable drivers simply instruct your Espen sales representative which drive currents you would like the programmable drivers to be set at, and Espen can pre-program the drivers to the selected drive current, prior to shipping the order.

For T5 lamps, the best solution depends on:

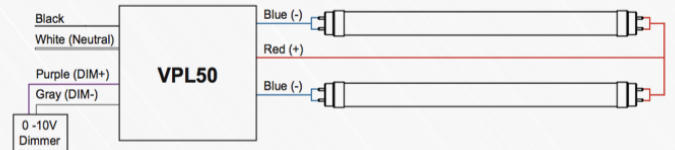
1. if you are replacing T5HO or T5HE fluorescent lamps, and
2. how many lamps will be run on each driver.

Based on these two factors, Espen sales representatives can determine how best to program the programmable driver. T5HE Espen Type C lamps are run at 360mA so the field adjustable drivers could be selected and used in the 360mA mode, and this would be the lower cost solution.

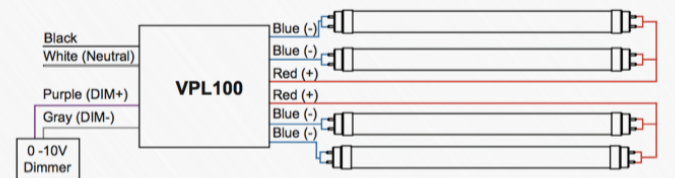
T5HO Espen Type C TLEDs should be run at 550mA and the field adjustable drivers don't go above 500mA. Therefore, the programmable drivers should be selected with T5HOs. If operating 2 T5HO lamps, the programmable driver can go up to 600mA and is a good solution programmed to 550mA. If 4 T5HO lamps are on a driver, the max drive current for the programmable VPL100 is 400mA, therefore, neither the programmable nor the field adjustable driver types will be appropriate for operating 4 T5HO lamps.

PROGRAMMABLE DRIVERS:

2 LAMP WIRING DIAGRAM

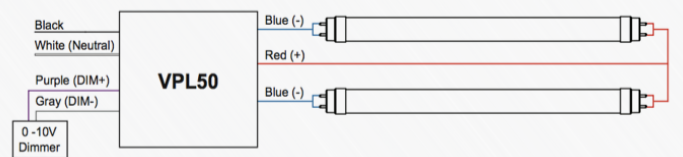


4 LAMP WIRING DIAGRAM

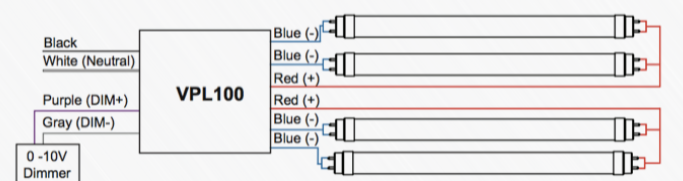


FIELD ADJUSTABLE DRIVERS:

2 LAMP WIRING DIAGRAM



4 LAMP WIRING DIAGRAM



1 See espentech.com for CoreTech™ and VersaLinear™ specifications.



Espen Technology is the leading manufacturer specializing in linear indoor retrofit solutions. Espen's product line includes Types A, B, C, and DE TLEDs, a broad selection of LED drivers, emergency drivers, and some of the most innovative LED retrofit kits in the market.

For additional support contact your Espen sales representative or email: Info@EspenTech.com

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