CASE STUDY

XP Power

Manufacturer of LED UV Curing Systems

OVERVIEW

XP Power helped a leading global manufacturer of industrial printing equipment. The manufacturer has around 500 employees, over $50m in revenue, and centers in both North America and Europe – and was experiencing issues in both locations.

The issues related to the power supplies within their equipment that their customers use for printing onto paper, textiles, chip board, fibre board and film. Although the problems were technically different, relating to the need for a neutral connection in Europe and supply stability & reliability in the US, they were both impacting the manufacturer's competitiveness and value proposition.

Accordingly, after a meeting in which XP Power introduced their new HPT Series 5kW DSP platform, the manufacturer approached XP Power for a single solution that would resolve both issues.

The HP Series

THE CHALLENGE

The manufacturer uses ultraviolet LED strings for the curing process in super wide or large format printing equipment. Depending on the specific configuration, these high voltage LED strings require DC power supplies delivering from 5kW to 20kW at nominal voltages of 100V, 200V and 400V, in constant current mode.

In the UK, the LED strings' requirements were met by a power supply with a 400V 3 phase AC input. Unfortunately, the power supply also needed a neutral line; this was typically not available in an end-user's facility, causing them unwelcome extra costs, delays, and inconvenience to install.

In the US center, different power supplies were being used. However, these had been designed for laboratory use, and were proving to be expensive and unreliable.

The system requires management through an "enable" rather than an "inhibit" control, meaning that, by default, the system would not be operational. This is because if the inhibit signal became disconnected or lost for any reason, there would be no way of powering the machine down.

Constant current output mode with accurate control was also extremely important, as LED light output varies with current rather than voltage – and the curing process is controlled by varying the LED brightness.

THE SOLUTION

Working with XP Power, the manufacturer established that the new HPT Series 5kW DSP controlled power supply provided a unified solution that they could use for both their UK and US curing solutions. These power supplies are scalable from 3kW to 30kW, with voltage output ratings to 200V, or 400V when operated in series.

Critically, they operate from a 3 wire + earth input, without needing a neutral connection.

The HPT series' DSP platform with digital interface offers many benefits for UV curing applications. Its user programmable constant output current, via digital bus or analog control, negates the need for additional costs associated with a constant current LED driver control stage in the customer electronics. The user can also define a current soft start, which satisfies the application's need for a controlled ramp-up of current on power up, to avoid an LED 'flash'.

Another standard user-defined option allows set-up of an 'enable' rather than an 'inhibit' control, as required by the application for safety reasons.

The customer controls the power supply directly using analog or digital programming depending on the system. They can choose analog voltage programming or RS485 communications as standard options.

A co-operative development effort

The manufacturer accomplished system development and tailoring of the power supply settings using the GUI, which is available to all customers to assist in the development stage. This was combined with XP Power's local technical support working with them while understanding the application and capabilities of the power supply.

The subsequent user defined options are factory-configured by XP Power, delivered "out of the box", and tailored to the customer requirement with no need for hardware changes due to the flexibility built into the DSP platform.

The customer developed the control software and algorithms for controlling the LED strings in real time using the comprehensive communication specification and user manual, with help from the XP Power technical support team.

RESULTS

The customer is deploying the HPT solution across a broad range of their products both in Europe and North America. They are using both analog and digital controls to set the lamp intensity directly from the power supply rather than requiring additional electronics. They no longer require the end users to re-wire their facility to add a neutral connection.

XP Power has reduced the cost to the customer and removed a barrier to sales for their system, making them more competitive. The XP Power solution is also proving more reliable than the previous power supply, saving further cost and inconvenience.