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## **Why pay more for a power supply with a longer warranty?**

Since all power supplies contain similar electronic components such as capacitors, semiconductors, resistors, transformers, inductors, etc., why pay more for one with a longer warranty period? In today's cost sensitive world, questions like this come up all the time. It's easy to get caught up in the idea of buying a power supply with the lowest price rather than its warranty time-span.

It's interesting to note that over 50% of TDK-Lambda's standard power supplies that are sold each year carry a five-year or longer warranty. Is it that these customers have lots of money to fritter away on this luxury, or do they realize some hidden benefits?

One of the major cost drivers in power supplies is, not surprisingly, the component costs. For example, all power supplies use electrolytic capacitors, which are available with various capacitance, voltage and operating temperature ratings.

Electrolytic capacitors contain a paste-like electrolyte which will eventually dry out and cause the capacitor to fail. How quickly this process occurs depends heavily upon what materials are used to make these capacitors and how close to their maximum ratings these components are utilized.

Electrolytic capacitors used in industrial-rated power supplies are more costly than those used in light commercial applications, but they are made to last for many, many years without failing. It's like comparing a professional mechanic's tools to those sold in variety stores. You get what you pay for when it comes to high quality tools; the same holds true when buying power supplies.

Furthermore, the power supply designer can choose to operate the capacitors at or near their maximum ratings, which will result in a low-cost product, but with a shorter life. Or, if a longer field life is a consideration, the designer will "derate" the capacitors, which means he will make sure the capacitors are running at a lower voltage and operating at temperatures that are well below its maximum. In this way the designer can achieve a much more reliable and longer life design at a somewhat higher cost. The same trade-offs in design are made for the semiconductors, resistors and other components that comprise the power supply.

In addition to the above, the life span of a power supply depends a great deal on the operating environment. In an industrial environment where a manufacturing plant is running multiple shifts, the power supply may be operating 24 hours a day, 360 days a year, with an ambient temperature within the equipment of perhaps +50°C (+122°F) or higher. Compare this to an office or medical environment where the ambient temperature might be typically +30°C (+86°F) and the equipment is running 8 hours/day, 5 days a week. Obviously, in the industrial application a more robust and higher quality power supply would be required to handle the rigors of these applications.

Power supply manufacturers want to avoid paying the high costs associated with repairing a failed unit within its warranty period. Therefore, based on their predicted life calculations and field return data, they set the warranty period such that the power supply will, in the vast majority of cases, not fail within the warranty period. And, they usually ensure that their supplies have a buffer life-time of 6-months to a year or so beyond their warranty period. So, it turns out that the warranty period is a fairly good indicator of how long you can expect the power supply in your equipment to run without failing. If you purchase a low cost commercial power supply with perhaps a one year warranty and install it in your industrial equipment that may carry a 3 year warranty, that would be a big mistake. Your low-cost power supply would quickly lose its cost advantage when it fails prior to your OEM warranty expiring.

So, we now come to the answer of our headline question:

### **Why pay more for a power supply with a longer warranty?**

**Answer:** Because it's the most cost effective way for the OEM to avoid premature field failures, trouble calls, unhappy customers, and high field service/product repair costs.



**HWS Series power supplies from TDK-Lambda come with a Limited Lifetime Warranty -- an industry first**

Posted by [Power Guy](#)