



Positronic Industries  
**white  
paper**

# Positronic's Blue Connectors are Green



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**E**nergy is essential to everyone. Often we do not give thought to where energy comes from or how much we consume until energy is not readily available.

Energy has become an area of focus for governments, private industry, and citizens. Enhanced methods of producing energy from traditional sources, development of new energy sources and conservation of energy from all sources have become more crucial than ever before.

Across the world, a vast amount of energy is consumed by the electronic equipment which we all rely upon in our daily lives. An unavoidable waste of energy occurs when power is distributed throughout electronic equipment. As electrical current flows through conductors and connectors, unwanted heat is generated in proportion to the amount of electrical resistance encountered.

Lowering resistance in connector contacts and conductors will reduce the amount of heat generated, and result in less lost or wasted energy. Additional energy will be saved as cooling systems will have less heat to draw out of the equipment.

In the past, the primary metric for power connectors has been contact current ratings. In the future, contact resistance may become equally important. While it is true that contact resistance and contact current ratings are closely associated, contact current ratings cannot be used to quantify the energy consumed by contacts.

Current ratings are based on the temperature rise of a connector or contact at a specific current level. A connector design or test method allowing relatively rapid heat dissipation may yield a reasonable temperature rise, while a relatively high amount of energy is still being wasted.

Within the connector industry, there are a variety of test methods used to quantify a particular performance metric. Different test methods can yield different values for the same metric. This lack of uniformity can be confusing to connector users who are trying to compare connectors offered by various manufacturers. Third party assessment can give connector users a common point of reference when making connector choices.

Contact resistance is used by **UL Environment** as the metric to determine the relative efficiency of connector contacts. **UL Environment** offers independent third party assessment and verification of claims made by manufacturers.

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Once assessments are made, **UL Environment** issues an Environmental Claims Validated (ECV) Mark, in this case contact resistance. The ECV will aid power connector users in evaluating contact efficiency as it relates to energy consumption. Visit [www.ulenvironment.com](http://www.ulenvironment.com) for more information.

As an example, recently an ECV was presented to **Positronic** by **UL Environment**. The ECV lists the average contact resistance for **Positronic's** VPB series size 16 power contacts at less than one milliohm each. This low contact resistance is achieved by use of high conductivity contact materials. In addition, **Positronic's** Large Surface Area (LSA) contact system is utilized as the interface between male and female power contacts in VPB series connectors.

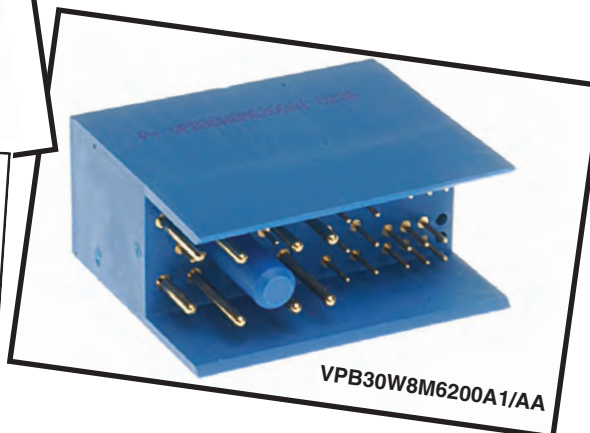
The VPB series was designed for use as the Zone 1 power connector in AdvancedTCA (ATCA) telecommunication computing systems. Zone 1 connectors provide power from backplanes to front boards in ATCA chassis. The low contact resistance of **Positronic's** VPB series provides energy savings opportunities in any application using this connector.

The following formula verifies the energy savings of a lower resistance contact at a given current: **Power Consumption (Watts) = Current Flow<sup>2</sup> (Amperes<sup>2</sup>) X Contact Resistance (Ohms)** Contact resistance has a one-to-one effect on power consumption. If, the contact resistance is reduced by half, the power consumption is reduced by half.

Low resistance power contacts also provide benefits in systems sensitive to voltage drop. This is demonstrated in the following formula: **Voltage drop across contact pairs = Current Flow (Amperes) X Contact Resistance (Ohms)**. Once again, contact resistance has a one-to-one effect. Reducing the contact resistance by half reduces voltage drop by half.

Higher energy costs and government legislation will cause energy conservation efforts to continue to intensify. If we consider the vast numbers of power contacts in electronic equipment around the world, it is clear how lower contact resistance can play a role in meeting

energy conservation goals. **Positronic** utilizes high conductivity contact materials and unique contact interfaces to provide low contact resistance in our power connector products. To learn more about these products, visit [connectpositronic.com](http://connectpositronic.com).



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