POWERBOX
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Powerbox announces high efficiency 750V DC/DC converter for light-rail and industrial applications

Press Release
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Powerbox, one of Europe's largest power supply companies, and for more than four decades a leading force in optimizing power solutions for demanding applications, has announced the release of its new high efficiency 750VDC input DC/DC converter for light-rail and industrial applications. The switching stage of the new PRBX ENR500D is based on an enhanced resonant topology providing a high efficiency of 95% typical across the low to high load range. Designed for railway applications, the ENR500D fulfills the stringent standard EN 50124-1 and delivers full performance across the temperature range of -40 to +70 degrees C. The ENR500D shortens time-to-market when a custom solution is required.

Dependent upon their location and the technology available at the time of installation, a wide variety of electrically powered traction systems are used in rapid transit systems around the world. Most metros operate from dc power either at 750VDC with a third rail, or 1.5kV with a third rail or from an overhead catenary. 750VDC is very common in light rail, powering both the rolling-stock equipment as well trackside signaling systems. The same voltage is also used in industrial equipment and in applications such as mining.

Taking into account the large range of applications and environmental conditions, PRBX designers have to consider where a power converter will be installed and as such, the environmental conditions it has to withstand. As specified in the European Standard EN 50124-1, Macro-environmental conditions (PD1 to PD4B), power converters can be part of a hermetically sealed equipment varying from no ventilation up to forced ventilation using clean filtered air from outdoors, and requiring a flexible, robust design able to meet such a large range of environmental conditions.

With more than 40 years of experience in designing power solutions for demanding applications in railway and industrial applications, PRBX designers have developed the 500W ENR500D platform that is built on a resonant topology combined with the latest MOSFET technology and the use of high performance magnetics. The ENR500D is designed to comply with the EN 50124-1 standard and for the so-called Pollution Degree 2 (PD2) such as control cabinets in the driver's cabin or passenger compartments. The ENR500D has ingress protection to IP20, and input to output double reinforced isolation. The unit complies with EMC emissions and immunity as specified in both EN 50124-1 and EN 50124-5.

The ENR500D has a nominal input voltage of 750VDC and operates within a range of 500 to 900VDC. The nominal output voltage is set to 48VDC, though it can be adjusted up to 60VDC. Nominal output power is 500W constant

Powerbox International AB
Industrigatan 8
PO Box 148
SE-646 22 Gnesta Sweden
www.prbx.com

across the temperature range of -40 to +70 degrees C in natural cooling conditions. The enhanced topology confers to the ENR500D a high efficiency of up to 95% from 20% to 100% load conditions. Designed to reduce systems energy consumption, at no load the ENR500D input power is less than 5W.

In accordance with EN50124-1, rated impulse voltage of 4.4kV, the input to output has a double reinforced insulation of 1000V, with a clearance 8.0mm, creepage ISO Class I and 10.0mm, ISO Class II 14.2mm.

In railway applications robustness is a must and the ENR500D is enclosed in an aluminum chassis with integral heatsink. It measures 163 x 230 x 80mm and has an ingress protection level of IP20. For reliability and availability all printed circuit boards have a protective coating.

As designed for a large range of light-rail and industrial applications, the ENR500D can be modified to offer other output voltages such as 12V, 24V or any other required by the system designer. Different output powers can also be provided in optimized mechanical formats.

The ENR500D platform's emission and immunity EMC figures are in accordance with EN50124-1 and EN50124-5.

Powerbox ENR500D high efficiency 750V DC/DC converter for light-rail and industrial applications

Related links:
ENR500D
https://www.prbx.com/product/enr500d/

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Industrigatan 8
PO Box 148
SE-646 22 Gnesta Sweden
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About Powerbox
Founded in 1974, with headquarters in Sweden and operations in 15 countries across four continents, Powerbox serves customers all around the globe. The company focuses on four major markets - industrial, medical, transportation/railway and defense - for which it designs and markets premium quality power conversion systems for demanding applications. Powerbox's mission is to use its expertise to increase customers' competitiveness by meeting all of their power needs. Every aspect of the company's business is focused on that goal, from the design of advanced components that go into products, through to high levels of customer service. Powerbox is rec3ognized for technical innovations that reduce energy consumption and its ability to manage full product lifecycles while minimizing environmental impact. Powerbox is a Cosel Group Company.

For more information
Visit www.prbx.com
Please contact Patrick Le Fèvre, Chief Marketing and Communications Officer
+46 (0) 158 703 00
marcom@prbx.com

Reference:
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