

High efficiency power modules deliver more available power in slim packaging for railway demanding applications

Press Release
February 11, 2016

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, announces the launch of two new products in its Railway DC/DC power converters ENAR150D series. The products perform at 93% high efficiency, saving energy, reducing power dissipation and allowing more power available in confined environment. The new series includes an extensive set of accessories, simplifying power integration into trains and related vehicles.

Railway modernisation and introduction of new technologies such as; On board WI-FI, GSM and LTE; Video systems and Telemetry require very efficient and flexible power solutions, which the ENAR150D series has been specifically designed for. Combining high efficiency power switching and optimized topology to reduce component count by 25% compared to conventional topologies, contribute to improve the MTBF (Mean Time Between Failure) and to the long-term reliability. Developed for low profile applications and efficient conductive-cooling, the ENAR150D series employs the latest planar-on-board technology, improving power dissipation and robustness towards shocks and vibration. The two new products, ENAR150D24 and ENAR150D110 deliver 150W output power, with a typical efficiency of 93% and are housed in slim packaging of 18.5mm (0.73") width, making possible to integrate the power modules in tight and confined environments.

"With the increased demand for safety as well as communication and passenger comfort, new generations of trains and related vehicles are requiring very efficient power supplies, able to operate in varying environments that could be as cold as Siberia or hot as Sahara! Energy performance, contributing to increased available power, in confined environments, becomes a must; but reliability, flexibility and simplicity in the supply chain, are strong requirements from railway equipment manufacturers" says Patrick Le Fèvre, Marketing Director. "One product fitting many applications is a challenge, to which the Powerbox ENAR150D series is the solution."

Designed to operate from 24VDC (16.8 – 30VDC) or 110VDC (77 – 137.5VDC), the ENAR150D24/2x12 and ENAR150D110/2x12 feature dual isolated 12V outputs that can be combined in four different modes, independent, parallel, serial and symmetrical, to accommodate the final application requirements. In Independent mode, the two 75W isolated outputs deliver 12V / 6.25A each. When connected in Parallel mode the output provides 150W, 12V / 12.5A. If a higher output voltage is required to power intermediate bus voltage to

embedded system, the Serial mode offers 24V / 6.25A. The fourth alternative, Symmetrical mode, provides a +/- 12V output, +/- 6.25A with a common zero.

In cases where additional power is required, the ENAR150D series can be connected in parallel, without adding any external component, using passive current sharing technology.

According to the EN50155 the ENAR150D operates in a wide range of temperature, -40°C to +70°C. Under Class T2, the full power, 150W, is delivered up to +55°C though with limited additional cooling the full power can be maintained up to +70°C. For low cooling environment such as in Class TX, the output power can be maintained at 140W from -40°C to +70°C.

Because "Train-On-Time" is very important, the railway industry requires extremely high reliability. Low component count topology and thorough selection of reliable components contribute to an MTBF of 500,000 hours at +45°C ambient. The minimum technical lifetime is of 15 years at +45°C and 80% load level.

Railway and related vehicles manufacturers are requiring simplicity and supply chain efficiency. With the increase number of power modules installed in many different mechanical configurations, equipment manufacturers are pursuing the concept: "One Power Modules to fit Many Applications." Designed with that concept in mind, along with the H15/DIN41612 connector, when combined with the dedicated set of accessories, the ENAR150D series becomes the 'Swiss Knife' to railway power architects.

The ENAR150D24 and ENAR150D110 have a width of only 18.5mm (0.728"), a height of 111mm (4.370") and a depth of merely 162mm (6.377") which makes it to fit into a large number of applications requiring low profile. The product is designed to fit into a 19" rack as specified in the IEC 60297-3. To facilitate insertion into rack systems (3U high / 4TE width), a front plate with complementary accessories can be added.

Operating within confined environments, without forced air cooling, embedded electronics in trains and related vehicles require very efficient cooling through conduction. The ENAR150D series is optimized for conduction cooling, if however additional cooling surface is required to interface the module to the infrastructure, the wall mounting kit allows the product to be fixed on the armature, improving conduction cooling.

Meeting shock and vibration IEC61373 category 1, class B, the ENAR150D operates safely in rugged environments, in addition to standard H15 insertion force, when extra security is required to prevent connector's disconnection, a set of connector retention brackets can be added.

Combining the standard module ENAR150D with defined accessories simplifies inventory, reducing time to market, making maintenance easier and matching the "One Power Modules to fit Many Applications" concept pursued by railway power architects.

The unit has an isolation input to output of 2100VAC, output to case of 1000VAC and output one to output two of 500VDC.

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The ENAR150D24 and ENAR150D110 have reverse polarity protection; a current limitation at 115% of the load, with automatic recovery; Over Voltage protection operating at 120-130% of nominal voltage and Individual output short circuit and over-temperature protection. The units also include input power limitation, reducing risk of inrush current when a large number of modules are powered at start-up.

The units are EMC approved in accordance to the EN50155, EN50121-3-2; Conducted and Radiated emissions according to EN55011 and EN50121-3-2; Radiated electromagnetic field to EN61000-4-3 20V/m. As well to: Fast transients EN61000-4-4, Surge EN61000-4-5, Conducted RF EN61000-4-6 and ESD tested to EN61000-4-2 (6kV contact discharge and 8kV air discharge).

The ENAR150D24 and ENAR150D110 comply with Fire Protection regulations and are approved to EN45545.

The ENAR150D24 and ENAR150D110 comply with RoHS and REACH

Approved to meet demanding railway applications, the ENAR150D24 and ENAR150D110 are ideal to power a large range of applications in trains and related vehicles though the 24V input can also be used in industrial applications when the 110VDC version suitable to power back-up bus voltage.

About Powerbox

Founded in 1974, with headquarters in Sweden and local operations in 15 countries on four continents, Powerbox serves customers around the globe. We focus on four major markets - industrial, medical, railway and transportation, and defense - for which the company designs and markets premium quality power conversion systems for demanding applications. Our mission is to use our expertise to increase our customers' competitiveness by meeting their entire power needs. Every aspect of our business is focused on that goal, from the design of the advanced components that go into our products to our customer service. Powerbox is recognized for technical innovations that reduce energy consumption and the company's ability to manage the full product lifecycle, minimizing environmental impacts.

For more information

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ENAR150D Series

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