



Powerbox's rugged power modules are perfect for harsh environments in extreme industrial automotive applications

Press Release
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Powerbox, one of Europe's largest power supply companies and a leading force for four decades in optimizing power solutions for demanding applications, has introduced a 400W DC/DC converter for use in industrial automotive applications in extreme environments. Designed for free air convection cooling, the ENA400-M is packaged in an aluminum enclosure with built in heatsink and potted with heat conductive polyurethane to improving thermal dissipation. Ratified for IP67 operation and with a power efficiency of 95%, the DC/DC converter can be operated in ambient temperatures from -40 to +50 degrees C using free air convection. Suitable for 24V and 48V industrial bus voltages, the converter meets ISO7637-2 and EN12895. The ENA400-M's high efficiency and highly optimized thermal design contribute to an increased lifetime in harsh environments.

Industrial automotive applications such as vehicles in the mining, timber and construction industries, agricultural machinery, trucks, and general outdoor infrastructures require extremely robust DC/DC power supplies that are able to operate flawlessly in humid and dusty conditions with high levels of vibration and often with little or no ventilation. Such conditions require power supplies to include state of the art power switching technology to reduce power dissipation, and thorough mechanical and thermal designs to ensure long life times in such demanding conditions and applications.

The ENA400-M series covers two industrial bus voltages, 24V (18 to 32V) and 48V (35 to 65V). The products include under-voltage, over-voltage and reverse-voltage protection. Saving battery power, in standby mode the input current is below 1 mA, and the no load current is less than 30 mA.

Two standardized output voltage are available, 12.5V(32A) and 24.5V(16A) both with an output power of 400W. The output is protected against short circuit by constant-current limitation circuitry that makes the product always ready to go after a high output load has been returned back to normal. This unique feature guarantees users that the DC/DC converter never shuts down while simultaneously protecting the application against faulty behavior or inrush current at start-up, with the added benefit of a quick return to normal operation as soon as the fault is removed or subsided.

"Industrial automotive manufacturers require energy efficient power supplies that are able to guarantee full operation in harsh environments yet are easy to use" says Martin Fredmark, Powerbox's VP Product Management. "The ENA400-M series is part of PRBX's 'one package to fit all' program developed with our customers that simplifies inventory management and reducing Time-to-Market."

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Built on planar technology with thermal-drains and low ESR MOSFET technology, the ENA400-M has a typical power efficiency of 95%. By the use of a manufacturing practice known as 'back-flip assembling', the dissipated power is directly conducted from the components to the top of the case, thus increasing cooling capacity.

Powerbox's ENA400-M DC/DC converter series has a galvanic isolation level of 500VDC input to output, and input/output to case. All products meet the immunity standard EN61000 (relevant chapters), the EN55022B (conducted and radiated) and a surge test level of 2kV.

Industrial automotive applications are often exposed to water, diesel fumes or dirt, and it is very important that the DC/DC converter cannot be adversely affected by such an aggressive environment. To prevent against any risk of corrosion or water penetration, the aluminum case is protected by a coating layer and encapsulated with a polyurethane resin guaranteeing the product complies with the Ingress Protection rating of 67 (IP67 – Protected from dust and against the effects of immersion in water to depth between 15 cm and 1 meter). The product can sustain 100% relative humidity – non-condensing.

To combat high levels of vibration that it may encounter in harsh environment conditions, the ENA400-M is tested to meet the profile of 5–50 HZ with an acceleration of +/-7.35m/s² per axis.

The ENA400-M's dimensions are 150 x 93 x 31 mm (5.12 x 3.78 x 1.22 inches) and it weighs 850 grams. For mounting purposes the product is delivered with pre-drilled holes in each corner, and input and output connections are achieved via fixed leads of 0.5 m and an ON/OFF loop cable is provided for remote control (by default the DC/DC converter is ON, opening the loop will turn-it OFF). The product is RoHS II and REACH compliant.

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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 recognized for technical innovations that reduce energy consumption and its ability to manage full product lifecycles while minimizing environmental impact.

For more information

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ENA400-M 400W Rugged DC/DC converter

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