

## 300W, IP66-Rated, Rugged, Railway Quality DC-DC Converter with built in RIA12 Protection BAR 65R-D3 Series (IP66)

- Packaged in waterproof IP66 enclosure
- RIA12 withstand capacity
- EN50155 input ranges
- For train and mobile applications
- Internal boards ruggedized and conformal coated
- Rugged, field-proven design
- Full electronic protection
- N+1 redundancy available



This series of rugged, railway quality DC-DC converters utilize field proven topology to generate the required output power. They meet the requirements of EN50155 for electronic equipment used on railway rolling stock. With input voltage surge withstand capability of  $3.5V_N$  for 20msec, it meets the requirements of RIA12. The converters are enclosed in robust, waterproof, die cast aluminum IP66 packages. The input and output are via sealed cable glands, circular connectors or custom connections. The internal boards are ruggedized and conformal coated for immunity to high levels of shock and vibration. Cooling is by internal conduction to the walls of the IP66 enclosure and by baseplate to an external chassis or cabinet wall, with additional convection via the outside surface. If installed on a heat-sinking surface, cooling is further enhanced and the converters achieve higher output power. An optional built-in redundancy diode allows for parallel and N+1 operation. Other options include a Form C output fail alarm and remote shutdown. Full electronic protection, low component count, large design headroom, and the use of components with established reliability contribute to high MTBF. The unit is manufactured at our plant under strict quality control.

### SPECIFICATIONS

<p><b>Input Voltage</b> 24Vdc (14.4 – 34V) 36Vdc (22 – 51V) 48Vdc (29 - 67V) 72Vdc (43 – 101V) 96Vdc (58 – 135V) 110Vdc (66 - 154V) For other input voltages, please consult factory</p> <p><b>Input Protection</b> Inrush current limiting Varistor Reverse polarity protection Internal safety fuse Limiter circuit for RIA 12 surges Low input voltages of less than the specified minimum will not damage the unit</p> <p><b>Isolation</b> 2200VDC input to chassis 3000VDC input to output 1500VDC output to chassis</p> <p><b>Standards</b> Designed to meet EN60950-1 and related standards</p> <p><b>Immunity</b> Meets EN50155, EN50121-3-2 and RIA12 according to: EN 61000-4-2 (ESD) EN 61000-4-3 (RF Immunity) EN 61000-4-4 (Fast Transients) EN 50155 (Surge) EN 61000-4-6 (Conducted Immunity) EN 50155 (Voltage Variations) Built-in surge protection: <math>3.5V_N</math> 20ms (meets RIA 12).</p>	<p><b>EMI</b> EN50121-3-2</p> <hr/> <p><b>Output Voltage</b> 12Vdc, 24Vdc, 48Vdc or 110Vdc 300W continuous output power Output is floating; either terminal can be grounded Other outputs on request</p> <p><b>Redundancy Diode</b> None Installed on request</p> <p><b>Line/Load Regulation</b> <math>\pm 1\%</math> combined from zero load to full load</p> <p><b>Dynamic Response</b> Max 5% voltage deviation for 10% to 50% load step, with better than 1msec recovery time</p> <p><b>Output Ripple / Noise</b> Less than 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHz BW)</p> <p><b>Output Overload Protection</b> Rectangular current limiting with short-circuit protection (no hiccup) Thermal shutdown in case of insufficient cooling (self resetting)</p> <p><b>Output Overvoltage Protection</b> Double regulator loop completely stable and independent of main loop</p>	<p><b>Efficiency</b> Input/output voltage dependent. Typically 85% at full load</p> <p><b>Operating Temperature Range</b> -25 °C to 55 °C for full specification Extended temperature ranges available on request</p> <p><b>Temperature Drift</b> 0.03% per °C over operating temperature range</p> <p><b>Cooling</b> Conduction to customer heat-sink or chassis and by additional natural convection via the surface of the IP66 enclosure</p> <p><b>Environmental Protection</b> IP66 enclosure Internal module: Ruggedized and conformal coated Potting of the internal module is also available</p> <p><b>Shock/Vibration</b> IEC 61373 Cat 1 A&amp;B</p> <p><b>Humidity</b> 5-100% condensing</p> <p><b>MTBF</b> 150,000 at 45°C Demonstrated MTBF is significantly higher</p>	<p><b>Indicators</b> None</p> <p><b>Control Input</b> None Optional</p> <p><b>Alarm Output</b> Not installed Optional output Fail Alarm</p> <p><b>Package/Dimensions (L x W x H)</b> D3: 360 x 160 x 90 mm 14.2" x 6.3" x 3.5" D3 with baseplate: 406 x 160 x 94 mm (16" x 6.3" x 3.7")</p> <p><b>Weight</b> Approx. 4.6 kg (10 lb)</p> <p><b>Connections</b> Internal barrier-type terminal block accessible via sealed cable glands. Optional connectors instead of cable glands</p> <p><b>RoHS Compliance</b> Fully compliant</p> <p><b>Warranty</b> Two years subject to application within good engineering practice</p>
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