



## DCCrail60 RAILWAY DC/DC CONVERTER

### SERIES DCCrail60

This fully encapsulated, railway quality power converter utilizes field-proven technology to generate the required output power.

It is a mature design with a track record in numerous applications.

The unit is entirely potted with a thermally conductive MIL-grade silicon rubber compound which provides protection from moisture and other contaminants, as well as immunity to shock and vibration.

Cooling is by conduction via a base plate to a heatsinking surface.

Full electronic protection, low component count, large design headroom and the exclusive use of components with established reliability contribute to a high MTBF.

The unit meets the requirements of EN50155 for electronic equipment used on railway rolling stock.

It is manufactured at our plant under strict quality control. Customized versions are also available.

### APPLICATIONS

- Railway Applications
- Transportation
- Mining
- Oil Rigs
- Military Applications
- Marine / Automotive / RV
- Electric Utilities and Substations
- Telecom Power Plants
- Manufacturing Locations
- Steel Mills
- Industrial Controls
- OEM Applications

### FEATURES

- Field-proven rugged design
- Full encapsulation
- Conduction cooled, no fan
- Wide temperature range
- Compact size
- Designed for rolling applications according to EN50155
- Full electronic protection
- Wide input range
- 60W output power



High frequency technology



Light weight, compact size



Full electronic protection



Extended temperature range



Conduction Cooling (no Fan)

# SPECIFICATIONS

|                               |  |
|-------------------------------|--|
| Input Voltage                 | 24Vdc (14.4-34V)<br>36Vdc (22-51V)<br>48Vdc (29-67V)<br>72Vdc (43-101V)<br>96Vdc (58-135V)<br>110Vdc (66-154V)<br>Consult factory for other inputs                 |
| Input Protection              | Inrush current limiting Varistor<br>Reverse polarity protection<br>Internal safety fuse<br>Lower voltage than the specified minimum input will not damage the unit |
| Isolation                     | 1500Vdc input to chassis<br>3000Vdc input to output<br>1500Vdc output to chassis   |
| Switching Frequency           | 135kHz $\pm$ 5kHz  |
| Output Voltage                | 5V, 12V, 24V, 36V, 48V or 110V<br>Outputs is floating; either terminal can be grounded<br>Consult factory for other voltages                                       |
| Redundancy Diode              | None   |
| Load/Line Regulation          | $\pm$ 1% combined from zero load to full load  |
| Dynamic Response              | Max 5% voltage deviation for 10% to 50% load step, with better than 1msec recovery time  |
| Output Ripple Noise           | Less than 1% peak-to-peak or 0.2% RMS of the output voltage (20MHz BW)   |
| Efficiency                    | 80 to 90% depending on input/output configuration  |
| Output Overload Protection    | Rectangular current limiting with short-circuit protection (hiccup type)<br>Thermal shutdown with automatic recovery in case of insufficient cooling               |
| Output Overvoltage Protection | Transorb installed across the output   |
| Standards                     | Designed to meet EN60950-1, EN 62368-1, CE and EN50155   |
| EMI                           | EN50121-3-2  |

|                          |   |
|--------------------------|---|
| Immunity                 | Meets criteria of EN50155 and EN50121-3-2 according to the following standards:<br>EN61000-4-2 (ESD)<br>EN61000-4-3 (RF Immunity)<br>EN61000-4-4 (Fast Transients)<br>EN50155 (Surge)<br>EN61000-4-6 (Conducted Imm.)<br>EN50155 (Voltage Variations) |
| Operating Temperature    | -40 to +70°C cold-plate temperature for full specification  |
| Humidity                 | 5 - 95% non-condensing  |
| Temperature Drift        | 0.03% per °C over operating temperature range   |
| Cooling                  | Conduction cooling via base plate to customer heat-sink or chassis  |
| Environmental Protection | Full encapsulation with thermally conductive silicon potting compound with UL94V-0 flammability rating<br>Meets environmental criteria as requested in MIL-810 C, D   |
| Shock/Vibration          | IEC 61373 Cat 1 A&B   |
| Dimensions               | P100: 58 x 54 x 181 mm<br>Includes terminal block and flanges<br>The case has clear alodine finish according to MIL-C-5541E Class 3<br>Mounting holes are clear   |
| Weight                   | 0.6 Kg  |
| Connections              | 5-pole barrier-type terminal block with 3/8" spacing<br>Cover can be provided upon request  |
| MTBF                     | 150,000 hours at 45°C<br>Demonstrated MTBF is significantly higher  |
| Indicators               | None<br>Optional ON LED adapter available   |
| Control Input            | None  |
| Alarm output             | None  |
| RoHS Compliance          | Fully compliant   |
| Warranty                 | 2 years   |

## Terminal Block Pin-out

| OUTPUT |   | GND                      | INPUT |   |
|--------|---|--------------------------|-------|---|
| +      | - | $\frac{\ominus}{\oplus}$ | +     | - |
| 1      | 2 | 3                        | 4     | 5 |

