

# 300W, Rugged DC/DC Converter with built-in RIA 12 Protection for Railway Applications

## BAR 65R-F3 Series

- Meets RIA 12 (surge withstanding)
- Field-proven rugged design
- For train and mobile applications
- Conduction/convection cooled
- Full electronic protection
- Wide input ranges



The BAR 65 Series rugged, railway quality DC/DC converter uses field proven topology to generate 300W output power. This design meets the requirements of EN50155 for electronic equipment used on railway rolling stock and has the input voltage surge withstand capability to meet RIA 12 (3.5V<sub>n</sub> for 20msec). Cooling is via baseplate to a heat-sinking surface and by natural convection. Ruggedizing and conformal coating provide additional immunity to shock, vibration and humidity. An optional redundancy diode allows parallel connection to achieve higher output power or N+1 redundancy. Other options include a Form C output fail alarm and remote shutdown. Low component count, large design headroom, and the use of components with established reliability result in a high MTBF. The unit meets the requirements of EN50155 for electronic equipment used on rolling stock. The BAR 65R is manufactured at our plant under strict quality control. Customized versions are also available.

### SPECIFICATIONS

#### Input Voltage

72Vdc (43 – 101V)  
96Vdc (58 – 135V)  
110Vdc (66 - 154V)  
Other inputs upon request

#### Input Protection

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

#### Isolation

1500VDC input to chassis  
3000VDC input to output  
1500VDC output to chassis

#### Standards

Designed to meet EN60950-1 and EN50155

#### Immunity

Meets criteria as requested in EN50155 and EN50121-3-2 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 protection against the 3.5V<sub>n</sub>, 20ms surge according to RIA 12.

#### EMI

EN50121-3-2

#### Switching Frequency

55kHz ±3kHz

#### Output Voltage/Current

Any voltage from 12V to 110Vdc  
Outputs is floating; either terminal can be grounded  
Consult factory for other voltages

#### Redundancy Diode

Optional

#### Line/Load Regulation

±1% combined from zero load to full load

#### Dynamic Response

Max 5% voltage deviation for 10% to 50% load step, with better than 2msec recovery time

#### Output Ripple / Noise

Better than 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHZ BW)

#### Output Overload Protection

Rectangular current limiting with short-circuit protection.  
Thermal shutdown with automatic Recovery in case of insufficient cooling

#### Output Overvoltage Protection

Double regulator loop. Second loop completely stable and independent of main regulator loop

#### Efficiency

Typically min. 80% at full load depending on input/output configuration

#### Operating Temperature Range

-25 °C to +70 °C cold plate temperature for full specification

#### Temperature Drift

0.03% per °C over operating temperature range

#### Cooling

Conduction to customer heatsink or chassis and natural convection

#### Environmental Protection

Ruggedizing  
Conformal coating

#### Shock/Vibration

IEC 61373 Cat 1 A&B

#### Humidity

5 – 95% non-condensing

#### MTBF

150,000 hours @ 45 °C  
Demonstrated MTBF is significantly higher

#### Indicators

Green "Output ON" LED visible through the cooling slots

#### Control Input

Optional

#### Alarm Outputs

Optional

#### Package / Dimensions (W x H x L)

F3: 132 x 64 x 300 mm (5.2" x 2.5" x 11.8") including terminal block and mounting flanges. Mounting holes are clear

#### Weight

2 kg (4.4 lbs)

#### Connections

12-pole barrier type terminal block with 3/8" spacing

#### RoHS Compliance

Compliant

#### Warranty

Two years subject to application within good engineering practice



European Stocking Distributor

Phone: +41 44 730 33 53

Email: sales@hvps-condatas.com / www.hvps-condatas.com  
Rietbachstrasse 7, 8952 Schlieren (ZH), Switzerland