

# 200W, Rugged DC/DC Converter for Railway and other Heavy-Duty Applications

## BAP 236R-FT Series

- ◆ Rugged, field-proven design
- ◆ For train and mobile applications
- ◆ Conduction/convection cooled
- ◆ Full electronic protection
- ◆ Wide selection of input/output combinations
- ◆ N+1 redundancy available



This rugged, railway quality DC/DC converter uses field proven topology to generate the required output power. It is a mature design with a track record in numerous applications. Cooling is via baseplate to a heatsinking 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. Full electronic protection, 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. It is manufactured at our plant under strict quality control. Customized versions are also available.

### SPECIFICATIONS

#### Input Voltage

24Vdc (14.4 – 34V)  
 36Vdc (22 – 51V)  
 48Vdc (29 – 67V)  
 72Vdc (43 – 101V)  
 96Vdc (58 – 135V)  
 110Vdc (66 – 154V)  
 Other inputs upon request

#### Input Protection

Inrush current limiting.  
 Reverse polarity protection  
 Varistor  
 Internal safety fuse  
 Lower voltage than specified minimum input will not damage unit

#### Isolation

1500Vdc input to chassis  
 3000Vdc input to output  
 1500Vdc output to chassis

#### Standards

Meets EN60950 and EN50155

#### Immunity

Meets criteria as requested in EN50155 and EN50121-3-2 according to:  
 EN61000-4-2 (ESD)  
 EN61000-4-3 (RF Immunity)  
 EN61000-4-4 (Fast Transient)  
 EN50155 (Surge)  
 EN61000-4-6 (Conducted immunity)  
 EN50155 (Voltage variation)

#### EMI

EN55022 Class B and  
 EN50121-3-2 conducted and radiated

#### Switching Frequency

55kHz +/- 3kHz

#### Output Voltage

Any DC output up to 130Vdc

#### Redundancy diode

Not included  
 Available as option

#### Line/Load Regulation

+/- 1% from no 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

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

#### Overload Protection

Current limiting with short circuit protection. Self-resetting thermostat for thermal protection

#### Output Overvoltage Protection

Double regulator loop

#### Efficiency

80 - 90% depending on input/output configuration

#### Operating Temperature

-25 to +70oC cold-plate temperature range without derating. Extended temperature range available on request.

#### Temperature Drift

0.03% per oC 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 oC  
 Demonstrated MTBF is significantly higher

#### Indicators

Output ON green LED visible through the cooling slot

#### Control Input

Optional

#### Alarm Outputs

Optional

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

F2: 114 x 58 x 256 mm  
 (4.5" x 2.3" x 10.1") including terminal block and mounting flanges  
 Mounting holes are clear

#### Weight

1.2 kg (2.6 lb)

#### Connections

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

#### RoHS Compliance

Fully compliant

#### Warranty

Two years subject to application within good engineering practice

#### Terminal Block Pin-out.

			DC OUTPUT			DC INPUT		
Not used	Not used	Not used	-	+	Not used	GND	-	+
1	2	3	4	5	6	7	8	9

Enhancements to these general specifications and customizing can be accommodated upon request. Specifications are subject to change.



**ANALYTIC SYSTEMS**  
 Power Conversion Solutions

8128 River Way, Delta B.C. V4G 1K5 Canada T. 604.946.9981 F. 604.946.9983 TF. 1.800.668.3884 (US/CANADA)

www.analyticssystem.com