

# 200W, Rugged, Railway Quality DC/DC Converter

## BAP 200R-FT Series

- ◆ Field-proven rugged 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. The unit is a simpler version of the field proven BAP 236R series with the same electrical performance but with fewer options available. Cooling is via base plate to a heat-sinking surface and by natural convection. Ruggedizing and conformal coating provide immunity to shock, vibration and humidity. An optional redundancy diode allows parallel connection to achieve higher output power or N+1 redundancy. Full electronic protection, low component count, large design headroom and the use of components with established reliability result in a high MTBF. The series meets the requirements of EN50155 for electronic equipment used on rolling stock. The unit is manufactured at our plant under strict quality control.

## 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

Rectangular current limiting with  
short circuit protection  
Thermal shutdown with automatic  
reset in case of insufficient cooling

### Output Overvoltage Protection

Double regulator loop  
Second loop completely stable and  
independent of main regulator  
loop, and also with tranzorb

### Efficiency

80% - 87% at full load, depending  
on output voltage

### Operating Temperature

-25 oC to +55oC cold-plate  
temperature range without  
derating.  
Extended temperature range  
Available

### 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

130,000 hours @ 45 oC  
Demonstrated MTBF is  
significantly higher

### Indicators

Output ON green LED visible  
through the cooling slot

### Control Input

None

### Alarm Outputs

Not included  
Available as option

### 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.



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