

## 200W, Rugged, Railway Quality, Convection Cooled DC/DC Converter BAP 236R-F2TH Series



- Rugged, field-proven design
- For train and mobile applications
- Regulated and adjustable output
- Pure convection cooling by heat-sink fins
- Full electronic protection
- Wide input range (EN50155)
- N+1 redundancy available as option

This rugged, railway quality DC/DC converter uses field proven topology to generate up to 200W output power. It is a mature design with a track record in numerous applications. Cooling is via heat-sink fins on the top of the unit; installation on a heat-sinking surface is not required. The unit can also be installed on thermally non-conductive surfaces, such as plastic, or on curved, uneven surfaces. An optional built-in redundancy diode allows for paralleling and N+1 operation or back-up battery connected. Additional ruggedizing and conformal coating are available for applications that require higher immunity to shock, vibration and humidity. 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 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 on request

#### Input Protection

Inrush current limiting  
Varistor  
Reverse polarity protection  
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

Designed to meet EN60950-1 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

EN50121-3-2

#### Switching Frequency

55kHz  $\pm$ 3kHz

#### Output Voltage

Any voltage in the 12V to 125V range  
Output is floating; either terminal can be grounded  
Other outputs on request

#### Redundancy diode

Not included  
Available as option

#### Line/Load 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

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 (no hiccup)  
Thermal shutdown in case of insufficient cooling (self -resetting)

#### Output Overvoltage Protection

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

#### Efficiency

Typically 85% at full load depending on input/output combination

#### Operating Temperature

-25 °C to + 55°C for full specification  
Extended temperature ranges with derating

#### Temperature Drift

0.03% per °C over operating temperature range

#### Cooling

Convection by heat-sink fins on top of unit

#### 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 cooling slots

#### Control Input

None

#### Alarm Output

None on standard version  
Optional output fail, Form C contacts

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

F2TH: heat-sinks on top of F2 chassis: 114 x 114 x 261 mm (4.5" x 4.5" x 10.3") including terminal block and flanges.  
Mounting holes are clear

#### Weight

1.6 kg (3.5 lb)

#### Connections

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

#### RoHS Compliance

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.**

*Designer and manufacturer of quality ac-dc power supplies and battery chargers, converters, inverters, dc-output UPS systems, complete rack mount systems and DC-input fluorescent lamp inverters since 1982. Custom or standard. Absopulse is a BABT-approved Facility.*



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