

1500W Rugged DC/DC Converter for Railway and other Heavy-duty Applications

BAP 1K5R-3U2

- Field-proven rugged design
- For train and mobile applications
- Fan cooling
- Full electronic protection
- Redundant, modular



This railway quality DC-DC converter uses a field technology to deliver the required output power. It is a mature design with a track record in numerous applications. The unit is built with two internal modules, which also provide inherent redundancy; the failure of one module would only cause a minor loss in output power. Several shelves can be paralleled for higher output power. The unit has input and output filtering in compliance with EN55022 and EN50121-3-2 conducted and radiated EMI standards. Built-in fans provide sufficient airflow for operation without de-rating to the specified temperature. Full electronic protection eliminates failure due to abnormal operational conditions, including application errors. The internal models are fully ruggedized and conformal coated for immunity to shock, vibration and moisture. Low component count, large design headroom, and the use of components with established reliability result in a high MTBF. It meets the requirements of EN50155 for electronic equipment used on railway rolling stock. The unit is manufactured at our plant under strict quality control.

SPECIFICATIONS

Input Voltage (nominal/range) 110Vdc (66-154V) Other inputs upon request	EMI EN50121-3-2	Output Overvoltage Protection Second regulator loop. Second loop completely stable and independent of main regulator loop	Indicators None Available as option
Input Protection Inrush current limiting. Reverse polarity protection Varistor Internal safety fuse Lower voltage than specified minimum input will not damage unit	Switching Frequency 55kHz \pm 3kHz	Efficiency Typically 90% depending on input/Output configuration	Control Input None Available as option
Input Isolation Depends on the required input/output combination. At minimum: 1500VDC input to chassis 3000VDC input to output 1500VDC output to chassis	Output Voltage 28V \pm 0.2V /53A Consult factory for other outputs	Operating Temperature -25 °C to +55 °C for full specification	Alarm Outputs Form C contacts for module fail alarm available on request
Standards Designed to meet EN60950-1 and EN50155	Redundancy diodes Installed on each internal module for separation and redundancy	Temperature Drift 0.03% per °C over operating temperature range	Package/Dimensions (H x W x D) 3U2: 132 x 132 x 407 mm (5.2" x 5.2" x 16") including terminal blocks and flanges. Mounting holes are clear.
Immunity Meets criteria as requested in EN50155 and EN50121-3-2 according to the following standards: EN61000-4-2 (ESD) EN61000-4-3 (RF Immunity) EN61000-4-4 (Fast Transients) EN 50155 (Surge) EN 61000-4-6 (Conduction Immunity) EN50155 (Voltage Variations)	Line/Load Regulation \pm 1.5% combined from zero load to full load including redundancy diode	Cooling Forced air by high-quality built-in fans	Weight Approx 4.5kg (10 lb)
	Dynamic Response Max 5% voltage deviation for 10% to 50% load step, with better than 1msec recovery time	Environmental Protection Ruggedizing Conformal coating	Connections Input: Terminal block Output: Threaded studs
	Output Ripple/Noise Better than 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHz BW)	Shock/Vibration IEC61371 Cat 1 A&B	RoHS Compliance Compliant
	Overload Protection Rectangular current limiting with short-circuit protection Thermal shutdown with automatic reset in case of insufficient cooling (self-resetting)	Humidity 5 - 95% non-condensing	Warranty Two years subject to application within good engineering practice
		MTBF 150,000 hours @ 45 °C per internal module. Demonstrated MTBF is significantly higher.	



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