750Vdc Input, 3kW Rugged DC-DC Converter for Railway & other Heavy-duty Applications
HVI 3KR-3U4 Series

- Field-proven rugged design
- For train and mobile applications
- Cooling by high quality built-in fans
- Full electronic protection
- Wide input range (EN50155)
- Redundancy diode

This rugged, railway quality DC-DC converter utilizes field-proven technology to generate the required output power. It is a mature design with a track record in numerous applications. The converter is designed to meet EN50155 for electronic equipment used on railway rolling stock. It accepts an input voltage of 750Vdc (525V-975Vdc range), the traction voltage typically required for mass transit vehicles such as trams, metros and light rail, and mining locomotives. The converter is built with three internal power modules operating parallel via redundancy diodes. This modular construction provides inherent redundancy; the failure of one internal module would cause a 33% drop in output power while the unit remains functional at 2000W. The converter can therefore also be used as a 2000W redundant power supply. The redundancy diodes also allow the connection of several units parallel. High quality built-in fans provide sufficient airflow for operation within the specified temperature range without de-rating. The fan draws air into the unit, which exhausts at the terminal side of the unit. All heat generating components are installed on aluminum heatsink blocks which are thermally connected to the base plate. This also ensures exceptional mechanical ruggedness. Conformal coating provides protection against humidity and airborne contaminants. Full electronic protection, low component count, large design headroom and the exclusive use of components with established reliability contribute to a high MTBF. It is manufactured at our plant under strict quality control.

SPECIFICATIONS

Input Voltage
750Vdc nominal
525V-975Vdc operating range
Other inputs on request

Input Protection
Inrush current limiting
Varistors
Reverse polarity protection
Internal safety fuse
Lower voltage than the specified minimum input will not damage the unit

Isolation
300Vdc input to chassis
4300Vdc input to output
5600Vdc type test
1000V/1500Vdc output to chassis

Standards
Designed to meet EN61010-1 and EN50155

Immunity
Meets criteria of EN 50155 and EN 50121-3-2, including:
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 Imm.)
EN 50155 (Voltage Variations)

EMI
EN50121-3-2

Switching Frequency
55kHz ±5kHz

Output Voltage/Current
24V, 36V, 48V or 110Vdc
Output is floating; either terminal can be grounded
Other outputs on request

Redundancy Diode
Installed internally for separation of the internal modules

Line/Load Regulation
±1.5% 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 0.2% rms or 1% pp (@ 20MHz BW)

Output Overload Protection
Rectangular current limiting with short-circuit protection
Thermal shutdown in case of insufficient airflow (self-resetting)

Output Overvoltage Protection
Second regulator loop, completely stable and independent of main regulator loop

Efficiency
Typically better than 84% at full load

Operating Temperature Range
-25°C to 55°C for full specification without derating
Extended temperature ranges available

Temperature Drift
0.03% per °C over operating temperature range

Cooling
Forced air by two high quality built-in fans.
Fans draw air into the unit

Environmental Protection
Ruggedizing
Conformal coating

Shock/Vibration
IEC 61373 Cat 1 A&B

Humidity
5 – 95% non-condensing

MTBF
110,000 hours @45°C (fans excluded)
Demonstrated MTBF is significantly higher.

Indicators
Green "Output ON" LED on each internal power module, visible through the cooling slots

Control Input
None on standard version
Available as option

Alarm Outputs
Module fail alarm.
Form C contact

Package/Dimensions (H x W x D)
3U4: 132 x 244 x 407 mm
5.2" x 9.6" x 16" including connectors, excluding flanges
19" rack mounted version also available

Weight
8kg (18 lbs.) approximately

Connections
Input: HV terminal block assembly
Output: Terminal block or threaded studs according to output current

RoHS Compliance
Compliant

Warranty
Two years subject to application within good engineering practice

The specifications on this data sheet are generic and are subject to change. Enhancements to these specifications can be provided upon request.

OEM of professional quality AC/DC power supplies and battery chargers, DC/DC converters, DC-AC sine-wave inverters, phase and frequency converters, DC-output UPS systems and complete power systems in 19" and 23" racks since 1982. Custom or standard. ABSOPULSE is a BABT-approved facility.

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