

300W, High Reliability, High Temperature, Conduction/Convection Cooled, Railway Quality DC/DC Converter BHT 319R-F4 Series

- Operation up to 85 °C
- No optocouplers, no electrolytics
- Rugged, railway quality
- Cooling by conduction/convection (no fans or forced air)
- Rugged construction
- Conformal coating
- High input/output isolation
- Full electronic protection
- Customized versions available



This rugged, railway quality DC/DC converter is designed for a long operating life at high operating temperatures. By eliminating optocouplers and electrolytic capacitors, the MTBF of the unit is greatly improved over conventional designs. The unit operates over a wide temperature range of -40 °C to 85 °C for full specification. In addition, all heat generating components are installed on aluminum heat-sink blocks which are thermally coupled to the heatsink fins and cooled by natural convection. The internal boards are conformal coated for immunity to humidity and contamination. The construction is robust and withstands high levels of shock and vibration. The input and output are filtered for low noise. Full electronic protection eliminates failure due to abnormal operating conditions, including application errors. Large design headroom and the use of components with established reliability also contribute to the long operating life of the unit. The converter meets the requirements of EN50155 for electronic equipment used on railway rolling stock. It is manufactured at our plant under strict quality control. An industrial quality version of this design, the BHT 319-F4, is also available.

SPECIFICATIONS

Input Voltage

72Vdc (43 – 101V)
96Vdc (58 – 135V)
110Vdc (66 - 154V)
Other inputs upon request

Input Protection

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

Isolation

Corresponding to input/output voltage, minimum:
1500Vdc input to chassis
3000Vdc input to output
1500Vdc output to chassis

Standards

Designed to meet EN 60950-1 and EN50155

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 (Conducted Imm.)
EN50155 (Voltage Variations)

EMI

EN50121-3-2

Switching Frequency

55kHz ±3kHz

Output Voltages

24V, 48V, 72V or 125Vdc
300W continuous
Output is floating; either terminal can be grounded
Consult factory for other voltages

Redundancy diode

Not installed
Available as option

Line/Load Regulation

±2% combined from 10% load to full load

Dynamic Response

Max 5% voltage deviation for 10% to 50% load step, with better than 2msec recovery time

Output Ripple / Noise

Better than 1% of output voltage peak to peak or 0.2% Vrms (20MHz BW)

Output Overload Protection

Rectangular current limiting with short-circuit protection
Thermal shutdown in case of insufficient cooling (self -resetting)

Output Overvoltage Protection

Double regulator loop.
Transzorb across the output

Efficiency

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

Operating Temperature Range

-40 °C to 85 °C for full specification

Temperature Drift

0.03% per °C, over operating temperature range

Cooling

Conduction to customer heat-sink or chassis and natural convection

Environmental Protection

Ruggedizing
Conformal coating
Heavy ruggedizing available on request

Shock/Vibration

IEC 61373 Cat 1 A&B

Humidity

5 - 95% non-condensing

MTBF

240,000 hours at 45 °C
Expected operating life is min. 30 years

Indicators

Green 'Output ON LED' visible through cooling slots

Control Input

Optional

Alarm Output

Not installed
Output fail alarm Form C contacts installed on request

Package/Dimensions (W x H x L)

F4: 130 x 64 x 353 mm
5.1" x 2.5" x 13.9 including terminal block and mounting flanges
Mounting holes are clear

Weight

2.2 kg (4.9 lb)

Connections

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

RoHS Compliance

Compliant

Warranty

Two years subject to application within good engineering practice

Terminal Block Pin-outs

NOT USED		DC OUTPUT				NOT USED			DC INPUT		
1	2	+	+	-	-	NOT USED	NOT USED	NOT USED	GND	-	+
1	2	3	4	5	6	7	8	9	10	11	12



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