

## 200W, High Reliability, High Temperature, Conduction/Convection Cooled, Railway Quality DC-DC Converters BHT 65R-F3 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 65-F3, is also available.

### SPECIFICATIONS

#### Input Voltage

24Vdc (14.4 – 34V)  
36Vdc (22 – 51V)  
48Vdc (29 – 67V)  
72Vdc (43 – 101V)  
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  
200W 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

250,000 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)

F3: 132 x 64 x 300 mm  
5.2" x 2.5" x 11.8" including terminal block and mounting flanges  
Mounting holes are clear

#### Weight

2 kg (4.4 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		
NOT USED	NOT USED	+	+	-	-	NOT USED	NOT USED	NOT USED	GND	-	+
1	2	3	4	5	6	7	8	9	10	11	12

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

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



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