

## 1000W, Rugged, Industrial Quality, Fan Cooled AC/DC Power Supply HBH 65F and HBH 65TF Series

- Rugged industrial quality
- Field-proven design
- Cooling by built-in fans
- Low noise output
- Full electronic protection
- N+1 redundancy as option



FF3 chassis



F3TF chassis

This rugged, industrial quality AC/DC converter has a proven track-record in numerous heavy-duty projects. It employs field-proven technology to generate up to 1000W output power for 230V input and output of 24Vdc and higher. The units are available in two mechanical formats. The FF3 chassis is cooled by two long life fans on one side of the unit, with additional conduction via base plate to a heat-sinking surface. Alternatively, the F3TF version is cooled entirely by two long-life fans on the top of the unit; no additional cooling is required. This version is raised above the installation surface, which allows for mounting on uneven or thermally non-conductive 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 is manufactured at our plant under strict quality control. Customized versions are available.

### SPECIFICATIONS

#### Input Voltage

230Vac  $\pm 15\%$   
or 300Vdc  $\pm 15\%$   
47 - 63Hz  
(115Vac input versions available with derating to 500W)  
Other inputs are available on request

#### Input Protection

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

#### Isolation

2250Vdc input to chassis  
4300Vdc input to output;  
8mm spacing  
500Vdc output to chassis

#### Standards

Designed to meet EN60950-1 and related standards

#### EMI

EN 55022 Class A with margins

#### Switching Frequency

55kHz  $\pm 3$ kHz

#### Hold Up Time

Min. 5ms at any input for 5% drop in output voltage

#### Output Voltage

24Vdc, 48Vdc or 125Vdc  
Output is floating; either terminal can be grounded  
Other outputs on request

#### Redundancy diode

Available as an 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 0.2% rms or 1% of the output voltage peak-to-peak (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 completely stable and independent of main loop

#### Efficiency

Typically 80% at full load depending on input/output combination

#### Operating Temperature

0 °C to 50 °C full specification  
Extended temperature ranges available with de-rating

#### Temperature Drift

0.03% per °C over operating temperature range

#### Cooling

Forced air by two high quality built-in fans

#### Environmental Protection

Basic ruggedizing  
Optional heavy ruggedizing and conformal coating is available

#### Shock/Vibration

IEC 61373 Cat 1 A&B

#### Humidity

5 - 95% non-condensing

#### MTBF

130,000 hours @ 45 °C (fans excluded)  
Demonstrated MTBF is significantly higher.

#### Indicators

None on standard version  
Available as option

#### Control Input

None on standard version  
Available as option

#### Alarm Outputs

None on standard version  
Available as option

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

F3TF chassis - fans on top of unit  
132 x 100 x 300 mm  
(5.2" x 3.9" x 11.8") or  
FF3: 155 x 64 x 300 mm  
(6.1" x 2.5" x 11.8") including terminal block and flanges  
Mounting holes are clear.

#### Weight

2.3kg (5 lbs)

#### Connections

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

#### RoHS Compliance

Fully compliant

#### Warranty

Two years subject to application within good engineering practice  
Contamination related failures and shipping costs excluded.

#### Terminal Block Pin-out

OUTPUT						INPUT					
NOT USED	NOT USED	+	+	-	-	NOT USED	NOT USED	NOT USED	GND	N	PH
1	2	3	4	5	6	7	8	9	10	11	12
									⊥	~	~



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