

## 300W, High Temperature, High DC-input Voltage, Conduction Cooled Industrial Quality DC/DC Converters HHT 300-FX Series

- Operation up to 85° C
- High DC-input voltage
- Wide DC-input range
- No optocouplers, no electrolytics
- Rugged, industrial quality
- Cooling by conduction
- Rugged construction
- Conformal coating
- Full electronic protection
- Customized versions available



This rugged, industrial quality DC/DC converter is designed for applications that require high DC-input voltage 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 baseplate temperature range of -40° C to 85° C for full specification. All heat generating components are installed on aluminum heat-sink blocks which are thermally coupled to the heatsink fins and cooled by conduction. 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. It is manufactured at our plant under strict quality control.

### SPECIFICATIONS

#### Input Voltage

400Vdc (300-500V)  
500Vdc (400-600V)  
600Vdc (500-700V)  
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:  
2500Vdc input to chassis  
4300Vdc input to output  
500Vdc output to chassis

#### Standards

Designed to meet EN60950-1 and related standards

#### EMI

Min. EN55022 Class A with margins

#### Switching Frequency

55kHz ±5kHz

#### 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 (no cycling)  
Thermal shutdown in case of insufficient cooling (self -resetting)

#### Output Overvoltage Protection

Second regulator loop, completely stable and independent of main regulator loop

#### Efficiency

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

#### Operating Temperature Range

-40° C to 85° C base plate temperature for full specification

#### Temperature Drift

0.03% per ° C, over operating temperature range

#### Cooling

Conduction to customer heat-sink or chassis, assisted by 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

170,000 hours at 60 °C  
Demonstrated MTBF is significantly higher.

#### 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)

FX: 153 x 67 x 358 mm  
6" x 2.7" x 14.2" 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

			DC OUTPUT				DC INPUT				
NOT USED	NOT USED	NOT USED	+	+	-	-	GND	NOT USED	-	NOT USED	+
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.

## 500W, High Temperature, High DC-input Voltage, Conduction Cooled Industrial Quality DC/DC Converters HHT 500-FX Series

- Operation up to 85° C
- High DC-input voltage
- Wide DC-input range
- No optocouplers, no electrolytics
- Rugged, industrial quality
- Cooling by conduction
- Rugged construction
- Conformal coating
- Full electronic protection
- Customized versions available



This rugged, industrial quality DC/DC converter is designed for applications that require high DC-input voltage 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 baseplate temperature range of -40° C to 85° C for full specification. All heat generating components are installed on aluminum heat-sink blocks which are thermally coupled to the heatsink fins and cooled by conduction. 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. It is manufactured at our plant under strict quality control.

### SPECIFICATIONS

#### Input Voltage

400Vdc (300-500V)  
500Vdc (400-600V)  
600Vdc (500-700V)  
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:  
2500Vdc input to chassis  
4300Vdc input to output  
500Vdc output to chassis

#### Standards

Designed to meet EN60950-1 and related standards

#### EMI

Min. EN55022 Class A with margins

#### Switching Frequency

55kHz ±5kHz

#### Output Voltages

24V, 48V, 72V or 125Vdc  
500W 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 (no cycling)  
Thermal shutdown in case of insufficient cooling (self -resetting)

#### Output Overvoltage Protection

Second regulator loop, completely stable and independent of main regulator loop

#### Efficiency

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

#### Operating Temperature Range

-40° C to 85° C base plate temperature for full specification

#### Temperature Drift

0.03% per ° C, over operating temperature range

#### Cooling

Conduction to customer heat-sink or chassis, assisted by 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

170,000 hours at 70 °C  
Demonstrated MTBF is significantly higher.

#### 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)

FX: 153 x 67 x 358 mm  
6" x 2.7" x 14.2" including terminal block and mounting flanges  
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