

## 400W, Encapsulated DC-DC Converter with RIA12 Input Range for Railway and other Heavy Duty Applications RWR 400-P500 Series



- RIA12 withstand capacity
- EN50155 input ranges
- For train and mobile applications
- Full encapsulation
- Wide temperature range
- Rugged, field-proven design
- Full electronic protection

This fully encapsulated, railway quality DC-DC converter uses a field-proven PDC 500 technology to generate the required output power. It is a mature product with a track-record in numerous applications. The unit meets the requirements of EN50155 for electronic equipment used on rolling stock. It has an input voltage range to withstand RIA12 surges (3.5Vn for 20msec). It is entirely potted with a thermally conductive MIL-grade silicon rubber compound to ensure immunity to high levels of shock, vibration and humidity. Cooling is by conduction via a baseplate to a heat-sinking surface. Low component count, large design headroom, and the use of components with established reliability result in a high MTBF. The unit is also suitable for transportation, mining, oilrigs, military and other harsh environments. It is manufactured at our plant under strict quality control.

### SPECIFICATIONS

#### Input Voltages

24Vdc (14.4 – 34V)  
36Vdc (22 – 51V)  
48Vdc (29 - 67V)  
72Vdc (43 – 101V)  
96Vdc (58 – 135V)  
110Vdc (66 - 154V)  
3.5V<sub>N</sub> for min 20msec  
Consult factory for other voltages and ranges

#### Input Protection

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

#### Isolation

1500Vdc input to chassis  
3000Vdc input to output  
1500Vdc output to chassis

#### Standards

Designed to meet EN60950-1, EN50155, EN45545, RIA12

#### Immunity

Meets criteria of EN50155 and EN50121-3-2 according to the following standards:  
EN 61000-4-2 (ESD)  
EN61000-4-3 (RF Immunity)  
EN61000-4-4 (Fast Transients)  
EN50155 (Surge)  
EN61000-4-6 (Conducted Imm.)  
EN50155 (Voltage Variations)  
Built-in protection against the 3.5Vn, 20ms surge according to RIA 12.

#### EMI

EN50121-3-2

#### Switching Frequency

55kHz ±3kHz

#### Output Voltages

24V, 36V, 48V or 110Vdc  
Output is floating, either terminal can be grounded.  
Consult factory for other outputs

#### Redundancy Diode

None installed  
Available as option

#### Line/Load Regulation

±1% combined from zero load to full load on each output

#### Dynamic Response

Max 5% voltage deviation for 10% to 50% load step, with better than 1msec recovery time

#### Output Ripple/Noise

Less than 1% peak-to-peak or 0.2% RMS of the output voltage (20MHz BW)

#### Output Overload Protection

Rectangular current limiting with short-circuit protection  
Thermal shutdown with automatic recovery in case of insufficient cooling

#### Output Overvoltage Protection

Second regulator loop completely stable and independent of main regulator loop

#### Efficiency

80 to 90% depending on input/output configuration

#### Operating Temperature Range

-40 to +70°C cold-plate temperature for full specification

#### Temperature Drift

0.03% per °C over operating temperature range

#### Cooling

Conduction cooling via base plate to customer heat-sink or chassis

#### Environmental Protection

Full encapsulation with thermally conductive silicon potting compound with UL94V-0 flammability rating

#### Shock/Vibration

IEC 61373 Cat 1 A&B

#### Humidity

5 – 95% non-condensing  
Contact factory for higher rating

#### MTBF

150,000 hours @ 45 °C  
Demonstrated MTBF is significantly higher

#### Indicators

None.

#### Control Input

None

#### Alarm Output

None

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

P500: 138 x 69 x 257 mm (5.4" x 2.7" x 10") includes terminal block and flanges  
Mounting holes are clear

#### Weight

2.6 kg (5.7 lb)

#### Connections

10-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-out

OUTPUT				Spares for Options		GND		INPUT	
+	+	-	-	NOT USED	NOT USED	NOT USED	⊥	-	+
1	2	3	4	5	6	7	8	9	10

Enhancements to these general specifications and customizing can be accommodated upon request. Specifications are subject to change.

*Designer and manufacturer of quality ac-dc power supplies and battery chargers, converters, inverters, dc-output UPS systems, complete rack mount systems and DC-input fluorescent lamp inverters since 1982. Custom or standard. ABSOPULSE is a BABT-approved Facility.*



#### ABSOPULSE ELECTRONICS LTD

110 Walgreen Road, Ottawa, Ontario | K0A 1L0 | CANADA  
Tel: +1-613-836-3511 | Fax: +1-613-836-7488

<https://www.absopulse.com/contact> | <https://www.absopulse.com>