

250W, Encapsulated DC/DC Converter with RIA12 Input Range for Railway and other Heavy Duty Applications RWR 250-P400 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 coupled inductor 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. This 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 base plate 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. Customized versions are also available.

SPECIFICATIONS

Input Voltages

24Vdc (14.4 – 34V)
36Vdc (22 – 51V)
48Vdc (29 – 67V)
72Vdc (43 – 101V)
96Vdc (58 – 135V)
110Vdc (66 – 154V)
3.5V_N 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

80kHz ±5kHz

Output Voltages

12V, 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
Meets environmental criteria as requested in MIL-810 C, D

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)

P400: 131 x 76 x 232 mm
(5.2" x 2.6" x 9.2")
Mounting holes are clear

Weight

2.2kg (4.8 lbs.)

Connections

9-pole barrier-type terminal block, 3/8" spacing. Snap on cover

RoHS Compliance

Compliant

Warranty

Two years subject to application within good engineering practice.

Terminal Block Pin-out

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



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