

## 100W, Encapsulated DC/DC Converter with RIA12 Input Range for Railway and other Heavy Duty Applications PDR 100R-P99 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 utilizes field proven topology to generate the required output power. The unit meets the requirements of EN50155 for electronic equipment used on railway rolling stock. The input voltage range ensures that the unit can withstand RIA12 surges (3.5Vn for 20msec). The converter 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 Voltage

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  
Other inputs upon request

#### Input Protection

Inrush current limiting  
Varistor  
Reverse polarity protection  
Internal safety fuse  
Low input voltages of less than the specified minimum will not damage the 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 EN50155, EN50121-3-2 and RIA12 according to:  
EN 61000-4-2 (ESD)  
EN 61000-4-3 (RF Immunity)  
EN 61000-4-4 (Fast Transients)  
EN 50155 (Surge)  
EN 61000-4-6 (Conducted Immunity)  
EN 50155 (Voltage Variations)  
Built-in surge protection: 3.5V<sub>N</sub> 20ms (meets RIA 12).

#### EMI

EN50121-3-2

#### Output Voltage

12Vdc, 24Vdc, 48Vdc or 110Vdc  
150W continuous output power  
Output is floating; either terminal can be grounded  
Other outputs on request

#### Redundancy Diode

None  
Available as option

#### Line/Load Regulation

± 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

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

#### Output Overload Protection

Rectangular current limiting with Hiccup-type short-circuit protection  
Thermal shutdown in case of insufficient cooling (self-resetting) as option

#### Output Overvoltage Protection

Second regulator loop completely stable and independent of main regulator loop  
Transzorb clamp installed across the output

#### Efficiency

Input/output voltage dependent.  
Typically 85% at full load

#### Operating Temperature Range

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

#### Temperature Drift

0.03% per °C over operating temperature range

#### Cooling

Conduction via base plate to customer heatsink or chassis

#### Environmental Protection

Full encapsulation with thermally conductive silicon potting compound with UL94V-0 flammability rating.  
Meets environmental criteria as requested in MIL-810C, D.

#### Shock/Vibration

IEC 61373 Cat 1 A&B

#### Humidity

5-100% non-condensing

#### MTBF

160,000 at 45°C  
Demonstrated MTBF is significantly higher

#### Indicators

None  
Optional

#### Control Input

None  
Optional

#### Alarm Output

Not installed  
Optional output Fail Alarm

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

P99: 81 x 66 x 156 mm  
(3.2" x 2.6" x 6.2")  
Mounting holes are clear

#### Weight

1 kg (2.1 lbs)

#### Connections

6-pole barrier type terminal block with 3/8" spacing  
Snap-on covers included

#### RoHS Compliance

Compliant

#### Warranty

Two years subject to application within good engineering practice

#### Terminal Block Pin Out

≤71Vdc input

OUTPUT			INPUT		
-	+	NOT USED	GND	-	+
1	2	3	4	5	6

≥72Vdc input

OUTPUT			INPUT		
-	+	NOT USED	GND	+	-
1	2	3	4	5	6



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