

# 50W, Rugged DC/DC Converter for Railway and other Harsh Environments

## DCW 50R Series

- ◆ Field-proven rugged design
- ◆ For train and mobile applications
- ◆ Conduction/convection cooled
- ◆ Full electronic protection
- ◆ Wide selection of input/output combinations



The DCW 50R Series rugged, railway quality DC/DC converter uses field proven topology to generate the required output power. It is a mature design with a track record in numerous applications. Cooling is via base plate to a heat-sinking surface and by natural convection. Ruggedizing and conformal coating provide added immunity to shock, vibration and humidity. Full electronic protection, low component count, large design headrooms, and the use of components with established reliability result in a high MTBF. The unit meets the requirements of EN 50155 for electronic equipment used on railway rolling stock. It is manufactured at our plant under strict quality control.

## SPECIFICATIONS

### Input Voltage (nominal/range)

24Vdc (15 - 34V)  
48Vdc (29 - 67V)  
72Vdc (43 - 101V)  
96Vdc (58 - 135V)  
110Vdc (66 - 154V)  
Other inputs on 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

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

### Standards

Designed to meet EN60950 and EN 50155

### Immunity

Meets criteria of EN50155 and EN50121-3-2 including:  
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 Imm.)  
EN 50155 (Voltage Variations)

### EMI

EN55022 Class B and EN50121-3-2 conducted and radiated

### Switching Frequency

47kHz +/- 2kHz

### Output Voltage/Current

12V/4A, 24V/2A, 48V/1A or 110V/0.45A are standard.  
Other voltages and higher power rating available on request

### Redundancy diode

None  
For customized versions only

### Line/Load Regulation

+/-1% combined from no 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 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHz BW)

### Overload Protection

Rectangular current limiting with hiccup type short circuit protection

### Output Overvoltage Protection

Double regulator loop.  
Transzorb installed across the Output

### Efficiency

80 to 90% at full load depending on input/output configuration

### Operating Temperature

-25 to +70°C cold-plate temperature range for full specification

### Temperature Drift

0.03% per °C over operating temperature range

### Cooling

Conduction to customer heatsink or chassis and natural convection

### Environmental Protection

Ruggedizing  
Conformal coating

### Shock/Vibration

IEC 61373 Cat 1 A&B

### Humidity

5 - 95% non-condensing

### MTBF

Min. 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)

F0: 94 x 48 x 160 mm  
(3.7" x 1.9" x 6.3") including terminal block and flanges  
Mounting holes are clear.

### Weight

0.55kg (1.2 lbs)

### Connections

6-pole barrier-type terminal block, 3/8" spacing

### RoHS

Fully compliant

### Warranty

Two years subject to application within good engineering practice

### Standard Terminal Block Pin-Out

OUTPUT			INPUT		
-	+	Not used	GND	+	-
1	2	3	4	5	6

Note: A few existing designs of this extensive series have a slightly different Pin-out

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



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