

100W, Rugged, Triple-output, Railway Quality DC/DC Converter

DCW 153R Series

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



This rugged, triple output railway quality DC/DC converter uses field-proven technology to generate the required output power. It is a mature design, the extended version of the DCW 152R series, with three fully regulated, isolated outputs. 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 headroom, 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. An industrial version of this design is also available.

SPECIFICATIONS

Input Voltage

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

1500Vdc input to chassis
3000Vdc input to output
1500Vdc output to chassis
1000V between outputs

Standards

Designed to meet EN60950 and EN50155

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

47 kHz \pm 2 kHz main PWM
72 kHz \pm 7 kHz for 12V regulator
72 kHz \pm 7 kHz for 5V regulator

Output Voltage

V1: 24Vdc \pm 0.4V / 2A
V2: 12Vdc \pm 0.2V / 2A
V3: 5.10Vdc \pm 0.05V / 4A
All outputs are fully regulated, floating and isolated from each other.
Either side of each output can be grounded
Other output voltages available

Redundancy diode

None

Line/Load Regulation

\pm 1% combined on all outputs

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

Individual rectangular current limiting on all three outputs.
Short circuit protection by hiccup on the V1 output and non-hiccup on the V2 and V3
Thermal shutdown in case of insufficient airflow (self resetting)

Output Overvoltage Protection

For + V1 output: fully stable second regulator loop independent of main regulator loop.
Transzorb on V2 and V3 outputs

Efficiency

80 to 85% at full load depending on input/output configuration

Operating Temperature

-20oC to +55oC cold-plate temperature range for full specification

Temperature Drift

0.03% per oC 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. 140,000 hours @45°C
Demonstrated MTBF is significantly higher

Indicators

"Output On" LED visible through cooling slots

Control Input

None

Alarm Output

None

Package/Dimensions (W x H x L)

F2: 114 x 58 x 256 mm
(4.5" x 2.3" x 10.1") including terminal block and flanges.
Mounting holes are clear

Weight

1.2 kg (2.6 lb)

Connections

9-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

DC OUTPUT						DC INPUT			
V1		V2		V3		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 subject to change.



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