Martek Power
500W PMR Series
Datasheet

DC/DC converter for railway applications

Description

The 500W PMR series is a range of cost-effective, medium power converters that comply fully with the latest rail specifications and norms for protection and EMC. They can be used individually or paralleled to create dual redundant or N+1 redundant systems, or simply to provide higher power capability. Although simple in construction, the mounting arrangement ensures compliance with the shock and vibration requirements of EN50155.

Special features include:

- High efficiency
- Wide choice of input and output voltages
- Output series device
- Active current share fitted as standard
- Conduction cooled or convection only cooled models available
- Fully compliant with rail standards, EN50155, EN50121.3.2

Input specifications

The following input voltages versions are available as standard:

110V	(66.0	-	137.5V)	dc	(Suffix A)
72V	(43.2	-	90.0V)	dc	(Suffix D)
52V	(31.2	-	65.0V)	dc	(Suffix C)
36V	(21.0	-	50.4V)	dc	(Suffix F)
24V	(16.8	-	33.6V)	dc	(Suffix B)

Parameter	Detail
Input Ripple	To EN50155
Input Protection	Reverse polarity protection (series device) Surges and transients EN50155 (direct and indirect)
Inrush Current	Active protection limits inrush to 6 x nominal current (after 0.1ms). (Except 24V input version)
Efficiency	88% typical
Hold-up time	10ms to EN50155 Class S2. For Suffix B & F units (24V & 36V input versions): hold-up is at a reduced load of 90% and covers input removal only.

Output specifications

Parameter	Detail
Maximum Output Power	500W (24V input - 400W maximum)
Output Versions	Single output only
Output Voltage	Can be specified from 24V to 110V
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C
Minimum Load	Zero
Line Regulation	±0.5%
Load Regulation	±0.5%

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Output specifications (Continued)

Parameter	Detail		
Remote sensing	Compensates for up to 250mV drop in each load line (for outputs between 12V & 24V).		
Temperature Coefficient	<0.02% / °C		
Output Ripple	<1% Pk-Pk of Output Voltage		
Output Noise	<75mV Pk-Pk superimposed (up to 20MHz)		
Response Time	0.5ms to within 2% (for a 10% - 100% load change)		
Current limit	Operates at approximately 110% - 130% of rated output current, stop & retry		
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.		
Over-voltage Protection	Operates if output exceeds 115% (±5%) of nominal. Reset by power-down, power-up sequence		
Output Good Indication	Green LED confirms output present		
Output Good Signal	Volt-free relay contacts (changeover)		
Parallel Operation	Two or more converters may be connected in parallel for dual redundant or N+1 operation, or higher system power capability.		
Output Series Device	Prevents failure of one converter from affecting operation of others connected in parallel. Implemented using low loss device for maximum efficiency.		
Current Sharing	Active current sharing ensures that two or more supplies connected in parallel share the load current to better than 60% / 40%. One interconnection between supplies required.		
Isolation	Input to Output	1.0kV ac	(tested at 1.4kV dc)
	Input to Case	1.0kV ac	(tested at 1.4kV dc)
	Output to Case	1.0kV ac	(tested at 1.4kV dc)

Environmental details

Parameter	Detail
Operating Temperature	-40°C to +55°C (70°C for 10 min.)
Storage Temperature	-40°C to +80°C
Cooling	Alternative models for convection only cooling or conduction & convection cooling. For cold wall (conduction) cooling, base plate temperature should not exceed 85°C.
Relative Humidity	95% max.
Shock & Vibration	EN51055 (EN61373)
Environmental Protection	IP20

Applicable norms

Parameter	Detail
EMC	EN50155 (2017), EN50121-3-2 (2016)
Other	EN50155 (2017)

Mechanical characteristics

Parameter	Detail		
Construction	Simple aluminium chassis		
Dimensions		Conduction / convection cooled	Convection cooled (option H)
	L	250mm	250mm
	W	158mm	158mm
	H	70mm	112mm
	(Note: width includes mounting flanges)		
Weight		1.6kg	3.2kg
Connections	Wago 236-501 terminal blocks as standard. M5 earth stud.		
Fixings	6x12mm slot on base, four positions. M5 earth stud.		

Option	Detail	Code
Connections	Power D type connectors	Q1
Cooling	Heatsink fitted	H

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