

DC/DC converter for railway applications



Description

The 150W ER series is a well-established product range designed specifically for use on railway rolling stock. Units are available in single and dual output versions with input ranges to cover all those typically found in rail applications. Housed in a rugged 3U Eurocassette, the ER series is suitable for both rack and bulkhead mounting and is available with either a heatsink or cold wall mounting plate. The range is compliant with national and international railway standards and norms.

Input specifications

The following input voltage 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)

Part number	Output 1		Output 2	
	V _{dc}	A	V _{dc}	A
ER 0500	5	25.0		
ER 1200	12	12.0		
ER 1500	15	10.0		
ER 1900	19	7.8		
ER 2400	24	6.0		
ER 3000	30	5.0		
ER 4800	48	3.1		
ER 0512	5	15.0	12	6.0
ER 1212	12	6.0	12	6.0
ER 1515	15	5.0	15	5.0
ER 2424	24	3.0	24	3.0
ER 1205	12	10.0	5	5.0
ER 2412	24	4.0	12	4.5
ER 5555	55	1.4	55	1.4

Parameter

Detail

Input Ripple	To RIA 13 and EN 50155
Input Protection	Reverse polarity protection; surges and transients to RIA 12, EN 50155
Inrush Current	Limited to typically 6x nominal current (after 0.1ms)
Efficiency	80% to 90% dependent on input / output voltage
Hold-up time	10ms to EN 50155 Class S2
Input fuse	20mm cartridge-style mounted on rear panel (except 24V dc input version)

Output specifications

Parameter

Detail

Maximum Output Power	150W (limited to 125W for 24V input or 5V output)
Output Versions	Single and dual output
Output Voltage	Can be specified from 5V to 48V
Setting Tolerance	±0.5% at 50% load, 15°C to 25°C
Minimum Load	Zero for all outputs
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Remote Sensing	Compensates for up to 250mV drop in each line (single output only)
Temperature Coefficient	<0.02% / °C

Output specifications (Continued)

Parameter	Detail	
Output Ripple	<1% Pk-Pk of Output Voltage	
Output Noise	<1% Pk-Pk superimposed (up to 20MHz)	
Response Time	1.0ms to within 2% (for a 20% - 90% load change)	
Indicators	Green LED for each output	
Output Protection	Output and signal lines protected against indirect transients to RIA 12, EN 50155	
Current limit	Operates at minimum 105% of nominal load Auto recovery	
Primary Protection	Operates at approximately 115% of rated output power for dual units	
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery	
Isolation (tested at dc equivalent voltage)	Input to Output	2.0kV ac
	Input to Earth	1.0kV ac
	Output to Earth	1.0kV ac
	Output to output	200V ac

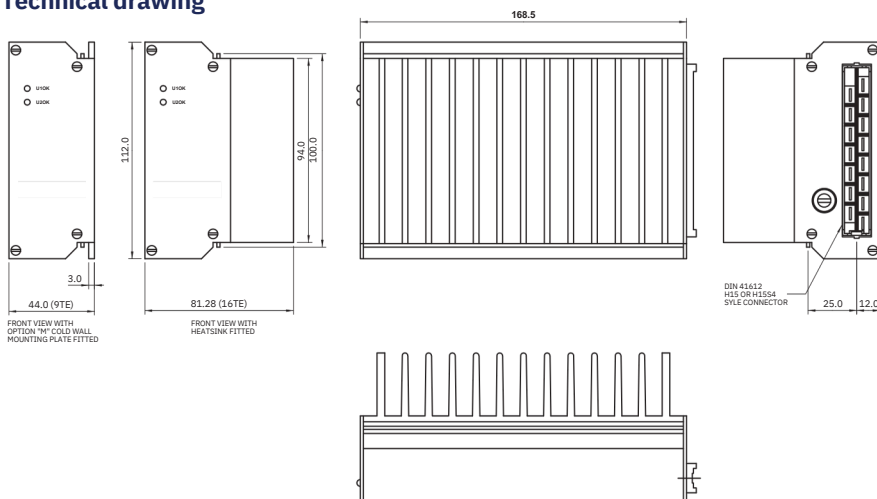
Electrical options

Option	Detail	Code
Input Fuse	Fitted on PCB	B
Input Fuse	Not fitted	Z
Current sharing	For parallel operation of two or more supplies using one interconnection. Sharing better than 60 / 40% on main output	S
Input Fail	Operates when input falls below minimum. (Active high or Active low)	I or J
Output Fail	Operates when U1 output falls below 96% of nominal value. (Active high or Active low)	K or L
Over-voltage	Limits voltages of U1 to safe level under fault conditions	P
Inhibit	TTL high to inhibit	V
Enable	Link to U1 return to enable	W

Environmental & mechanical options

Option	Detail	Code
Extended temperature range	-40°C to +71°C	T
Connector retaining clips	2 per fitted to secure mating DIN connector	H
Cold wall plate	Drawing 289-901	M1
Cold wall plate	Drawing 289-902	M2
Front panel	Front panel and rack mounting plate Drawing 289-908	Q4 + M3
Connections	Cables (halogen free cable)	Q6

Technical drawing



Environmental details

Parameter	Detail
Operating Temperature	-25°C to +71°C (no derating)
Storage Temperature	-40°C to +85°C
Cooling	Convection
Relative Humidity	95% max
Shock & Vibration	EN 50155 (EN 61373)
Environmental Protection	IP54

Applicable norms

Parameter	Detail
EMC	RIA 12, EN 50155 (2007), EN 50121-3-2 (2006)
Other	EN 50155 (2007), EN 45545-2 (2013)

Mechanical characteristics

Parameter	Detail
Construction	Euro cassette - suitable for either rack or bulkhead mounting
Dimensions	Length = 168.5mm
	Width = 16TE - heatsink version 9TE - cold wall mount
	Height = 3U
Weight	1.3kg heatsink version. 0.9kg cold wall mount version
Connections	DIN 41612 H15 Class 1 Retaining clips option Cable connection option
Fixings	Four slotted M6 holes in heatsink. Cold wall mount options



Note: M2 cold wall mount version

Pin no	Single O/P	Dual O/P
4	U1 +	U1 +
6	U1 +	U1 +
8	U1 -	U1 -
10	U1 -	U1 -
12	U1 sense +	U2 +
14	U1 sense -	U2 -
16	Not connected	Not connected
18	Inhibit	Inhibit
20	Power/Output fail	Power/Output fail
22	Current Share	Current Share
24	Earth	Earth
26	Vin +	Vin +
28	Vin +	Vin +
30	Vin -	Vin -
32	Vin -	Vin -



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