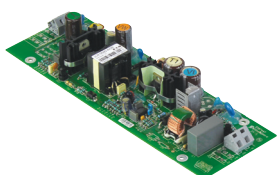




## DC/DC converter for railway applications

JL & JLH open frame version



### Description

Originally designed for on-board passenger information systems, the JL series is now available in a wide variety of input and output configurations. Capable of providing 35W, 50W or 60W\* of continuous power at ambient temperatures of up to 75°C, the low component count makes the JL series a highly reliable yet cost-effective solution. For applications where the converter will be housed within an enclosure, the open frame version offers a further cost saving. The JL and JLH series have recently expanded to include alternative size footprints, connectors and functional features.

### Special features include:

- Wide operating temperature range
- Low component count, high reliability
- Simple construction - open frame or enclosed versions available
- Low cost

\*New versions: JLR & JLHR series with functional options and to RIA12

\*New versions: JLM & JLHM M1 Conduction cooled versions

### JL series family-overview

	JL versions rectangular PCB with enclosure option
	JLR versions include RIA12 and other functional options
35Watts	JLM versions mini PCB footprint with enclosure option
	JLM M1 versions mini PCB footprint with conduction cooled package
50Watts	All versions as above; JLH, JLHR, JLHM
60Watts*	JLHM option '/2'

### Input specifications

The following input voltages versions are available as standard:

110V (66.0 - 137.5V) dc (Suffix A)
72V (50.0 - 90.0V) dc (Suffix D)
52V (36.0 - 65.0V) dc (Suffix C)
36V (25.0 - 50.4V) dc (Suffix F)
24V (16.8 - 33.6V) dc (Suffix B)

### Options for JLR and JLHR versions

Code	Detail
L	Output OK Relay (NO and NC)
R	RIA12 filtering
V	Enable. Connect to + input to enable

Parameter	Detail
Input Ripple	EN50155
Input Protection	Reverse polarity protection. Surges and transients to EN50155 (Direct and Indirect)
Inrush Current	Limited to typically 5 x nominal current (after 0.1ms)
Efficiency	85% typical
Hold up time	10ms to EN50155 S2 (including input short)
Supply change over (dips)	0 - 6Un 100mS to EN50155 Class C1



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## Output specifications

Parameter	Detail	
Maximum Output Power	35W 50W 60W*	JL, JLR, JLM, versions JLH, JLHR, JLHM versions JLHM option '/2'
Output Versions	Single	
Output Voltage	Fixed output can be specified from 5V to 110Vdc (5Vdc output versions limited to 35Watts)	
Setting Tolerance	±2%	
Line / Load Regulation	±2%	
Temperature Coefficient	<0.02% / °C	
Output Ripple	<1% Pk-Pk of Output Voltage	
Output Noise	<75mV Pk-Pk superimposed (up to 20MHz)	
Response Time	1.0ms to within 2% (for a 20% - 90% load change)	
Current Limit	Operates at approximately 115% of rated current	
Isolation (tested at dc equivalent voltage)	Input to Output	2.0kV ac
	Output/Input to Case	1.0kV ac (enclosed version)

\* - Limited availability - consult factory for further details

## Environmental details

Parameter	Detail	
Operating Temperature	-25°C to +75°C (no derating)	
Storage Temperature	-40°C to +80°C	
Cooling	By convection (M1 versions have conduction cooled package)	
Relative Humidity	95% max.	
Shock & Vibration	EN50155 (EN61373)	

## Applicable norms

Parameter	Detail	
EMC	EN50155 (2017), EN50121-3-2 (2016)	
Other	EN50155 (2017) RIA 12(version specific)	

JL & JLH enclosed version



JLM & JLHM open frame version



## Mechanical characteristics

Parameter	Detail		
Construction	Open frame PCB with Enclosure options		
Dimensions (Length x Width x Height)	<b>Version</b>	<b>PCB Footprint</b>	<b>Enclosed version</b>
	JL & JLH	220x73x30mm	250x78x35mm
	JLR & JLHR	220x73x30mm	250x78x35mm
	JLM & JLHM	115x85x23mm	145x91x35mm
	JLM M1 Conduction cooled	135x85x30mm with base plate	
Finish	PCB, Conformal coating. Enclosure, plated mild steel.		
Weight	<0.5kg		
Connections	<b>Version</b>	<b>Input Connector</b>	<b>Output Connector</b>
	JL & JLH	Wago 236-501	Wago 236-501
	JLR & JLHR	Wago 236-501 or Wago 721-434	Wago 236-501 or Wago 721-435
	JLM & JLHM	(standard) Wago 236-501 (Q4 option) Wago 721-433/001-000 (Q6 option) Wago 236-501 (Q1 option) 3W3 male power D-type	Wago 721-434/001-000 Wago 721-433/001-000 Wago 236-501 3W3C coded female power d-type

## Options for all series

Code	Detail	
T	Extended temperature range; -40°C operating	
S	Enclosure with DIN Rail mounting clips	
S2	Enclosure no clips	

## Options for JLM & JLHM series only

Code	Detail	
M1	Conduction cooled package	
Q1	Power d-type connectors	
Q4	Alternative Wago input connector (input & output both cage clamp)	
Q6	Alternative Wago output connector (input & output both pluggable)	

JLM & JLHM enclosed version



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