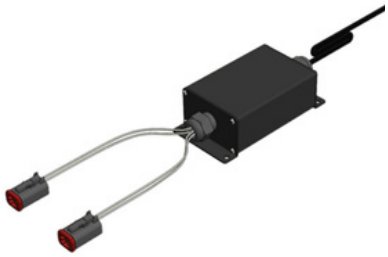
Martek Power
25W USBR Series
Datasheet



IP54 & IP65 (Option ‘S’) versions

IP40 version (Option ‘P’)

AC/DC & DC/DC USB Chargers for railway applications

Description

The USBR converter is a very cost-effective USB charger designed specifically for use on rail vehicles. Housed in a rugged chassis-mounting enclosure rated to IP40, IP56, or IP65, the converter’s small size makes it ideal for mounting almost anywhere in the passenger compartment, such as within passenger seat frames. Models are available for direct connection to the vehicle battery (dc input), or an auxiliary 110/230VAC supply, and provide two independent 5V outputs, each rated at 2A. The range is fully compliant with the latest international railway standards, including shock and vibration, EMC and fire protection.

Special features include:

- AC and DC input models available
- DC input model is ultra-wide range covering all nominal vehicle battery voltages
- Two independent, separately regulated and protected outputs
- EN 50155 (2017), EN 50121.3.2 (2016) and EN 45545 (2013) compliant
- IP54 rated (IP65 version and IP40 version with connectors as an option)

Available models

Part number	Nominal Input	Input Range
USBR 0500-Z/1	230V ac	207 –253V ac
USBR 0500-XZ/1	110 / 230V ac	90 –253V ac
USBR 0500-DC/1	24 / 36 / 72 / 110V dc	16.8 –137.5V dc

AC input specifications

Parameter	Detail	
Nominal input voltage	See table above	
Input voltage range	See table above	
Input frequency	47 – 63Hz	
Inrush current	To EN 50155	
Efficiency	83% typical	
Supply interruptions	EN 50155 Class S1 (no hold-up)	
Input fuse	Internal fuse protects against catastrophic converter failure (factory replacement only)	
Isolation (tested at dc equivalent voltage)	Input to output	3.0kV ac
	Input to case	1.5kV ac
	Output to case	1.5kV ac
	Output to output	None

DC input specifications

Parameter	Detail	
Supply fluctuation	Temporary supply over-voltages and dips in accordance with EN 50155	
Input ripple	To EN 50155	
Input protection	Reverse polarity protection by series device Surges and transients to EN 50155 (direct and indirect)	
Inrush current	To EN 50155	
Efficiency	80% typical (75% 24V input), 40-100% load	
Supply interruptions	EN 50155 class S1 (no hold-up)	
Input fuse	Internal fuse protects against catastrophic converter failure (factory replacement only)	
Isolation (tested at dc equivalent voltage)	Input to output Input to case Output to case Output to output	2.0kV ac 1.0kV ac 1.0kV ac None

Output specifications (per output)

Parameter	Detail
Number of outputs	Two. Independently regulated and protected
Nominal output voltage	5.15V *(set at 50% load, measured at the output connector)*
Output current	2A maximum
Minimum load	Zero
Output voltage range	4% total for setting tolerance, line and load regulation. N.B. output not to exceed 5.25V under any condition.
Temperature coefficient	<0.02% / °C
Output ripple	<50mV Pk-Pk of output voltage
Output noise	<50mV Pk-Pk superimposed (up to 20MHz)
Response time	0.5ms to within 2% (for a 20% -90% load change)
Output protection	Output protected against indirect transients to EN 50121.3.2
Current limit	Operates at <3.0A. Auto recovery
Short circuit protection	Stop & retry (hiccup mode)
Thermal protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery

Environmental details

Parameter	Detail	
Operating Temperature	EN 50155 class OT3: -25°C to +70°C (no de-rating) (85°C for 10 minutes)	
Storage Temperature	-40°C to +85°C	
Cooling	Convection	
Relative Humidity	95% max	
Shock & Vibration	EN 50155 (EN 61373) for mounting in any orientation	
Environmental Protection	Standard (flying leads): Option 'P' (pluggable connectors): Option 'S' (flying leads, sealed):	IP54 IP40 IP65

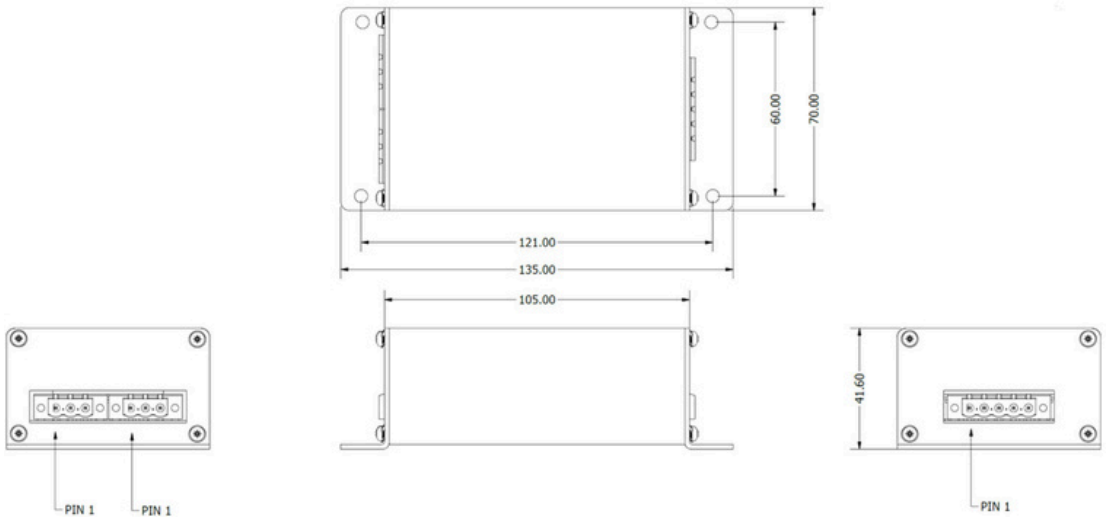
Mechanical characteristics

Parameter	Detail
Construction	Extruded aluminium enclosure with mounting flanges front and rear
Dimensions (LxWxH)	105x70x41.6mm (enclosure dimensions excluding mounting flanges and cable glands)
Finish	Black anodised
Weight	270g (option 'P' model)
Input connection	1m length 3 core rail approved cable, unterminated Option 'P' –5 way Phoenix Contact MSTB
Output connections	4 x 1.5mm^2 cables, length 500mm Each output terminated in a Deutsche 4 way connector, type DT06-4S (plus W4S wedgelock). Two unused pins connected together to identify converter to connected device as DCP (Dedicated Charging Port) Option 'P' –3 way Phoenix Contact MSTB (2 off)
Fixings	4 x Ø4.5mm clear holes in mounting flanges

Applicable norms

Parameter	Detail
General	EN 50155 (2017)
EMC	EN 50155 (2017), EN 50121-3-2 (2016)
Fire & Smoke	EN 45545-2 (2013) HL3
Safety	EN 50153 (2014), EN 50124-1 (2017)

Outline drawing (option 'P')



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