Martek Power
300W PMEH series
Datasheet

DC/DC converter for railway applications

Description

The PMEH series is the highest power model in a new range of highly cost effective, single output converters for chassis mounting. The range is fully compliant with the latest European standards for railway equipment, including EMC and fire and smoke.

Special features include:

- Very compact, lightweight and cost effective
- Very high efficiency
- Each model covers two nominal vehicle battery voltages
- Output current sharing as standard
- Fully compliant with rail standards, including EN 50155 (2021) & EN 50121.3.2 (2016)

Input specifications

The following input voltages versions are available as standard:

72 / 110V (50.4 - 137.5V) dc (Suffix AD)
24 / 36V (16.8 - 45.0V) dc (Suffix BF)

Part number	Output V_o [Vdc]	Output I_o [A]
PMEH 1500	15	20.0*
PMEH 2400	24	12.5

** - 15V output only: de-rate to 200W at 24V input and 70°C ambient*

Options

Code	Detail
B	Board mounted input fuse

Parameter	Detail
Short term supply under / over voltages (< 2 s)	43.2 - 154V (Suffix AD) 14.4 - 50.4V (Suffix BF)
Input Ripple	To EN 50155
Input Protection	Reverse polarity protection by active low loss series device Surges and transients to EN50155 (direct and indirect)
Inrush Current	To EN50155
Efficiency	93% typical
Supply interruptions	EN 50155 Class S2 (10ms interruptions) with low impedance source (input short) *except @ 24V input which achieves 5ms at 300W and 10ms at 200W*
Input fuse	Not fitted as standard; external fuse or circuit breaker required. Option for board mounted fuse (fitted for safe unit protection in the case of catastrophic failure. Factory replacement only).

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Output specifications

Parameter	Detail
Maximum output power	300W (200W for 15V output at 24V input and maximum ambient. See de-rating curve for further details)
Output versions	Single output only
Output voltage	See table
Setting tolerance	±1.0% at 50% load, 15°C to 25°C
Minimum load	Zero
Start-up delay (typical)	at 24V input: <1.5s at 72V input: <1.5s at 36V input: <1.0s at 110V input: <1.0s
Remote sensing	Not fitted
Maximum output variation	±3.0% combined line & load regulation
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 1% (for a 10% - 100% load change)
Current limit	Operates at 105 - 130% of rated output current
Thermal protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.
Current sharing	Passive current sharing with output droop.
Redundant operation	Low loss output series device included as standard
Indicators	Green 'Output OK' LED
Output monitoring	Volt free relay contacts
Maximum capacitive load (output model dependant)	Output model: 15V 24V Capacitance: 10,000µF 4,000µF
Isolation	Input to Output 2.0kV ac (tested at 3.0kV dc) Input to Case 1.0kV ac (tested at 1.5kV dc) Output to Case 1.0kV ac (tested at 1.5kV dc)

Environmental details

Parameter	Detail
Operating Temperature	EN 50155 class OT4: -40°C to +70°C (no de-rating). (85°C for 10 minutes.) Base plate is intended for cold wall mounting and must not exceed 85°C for full power operation (90°C during 10 minute over temperature).
Output power de-rating	Above 70°C: 3.0% / °C; 100°C absolute maximum
Storage Temperature	-40°C to +85°C
Cooling	Convection / Conduction. Mounting surface should be thermally rated at ≤1.0°C/W. A thermal mass equivalent to 300g of aluminium is required for 10 minutes operation at 85°C.
Relative Humidity	95% max.
Shock & Vibration	EN 50155 (EN 61373) for mounting in any orientation
Environmental Protection	IP20. PCB is conformal coated

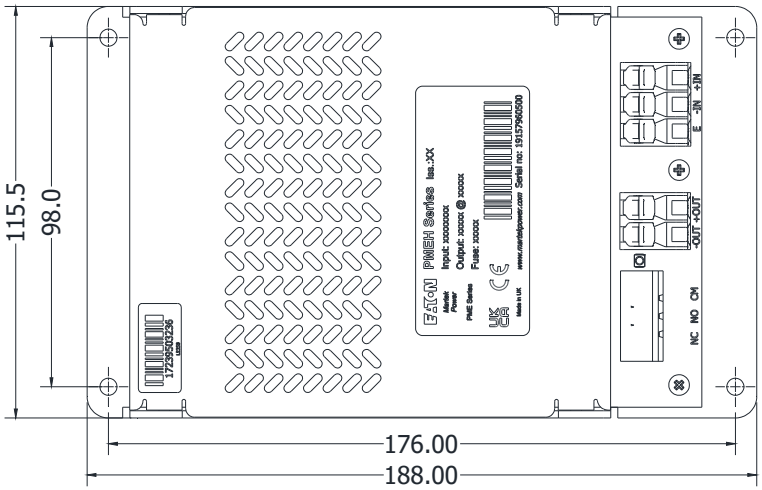
Mechanical characteristics

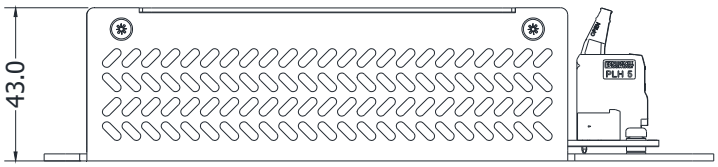
Parameter	Detail
Construction	Ventilated aluminium enclosure, black anodized
Dimensions (L x W x H) (including mounting flanges)	188.00 x 115.50 x 43.00mm
Weight	800g
Connections	Input: Phoenix PLH 5/ 3-7.5-ZF Output: Phoenix PLH 5/ 2-7.5-ZF Output monitor: Phoenix MSTB 2,5/ 3-GF-5,08
Fixings	4 x ∅4.8mm clear holes

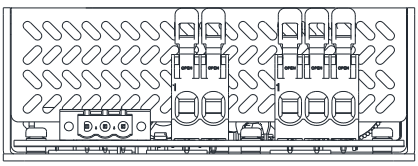
Applicable norms

Parameter	Detail
EMC	EN 50155 (2021), EN 50121-3-2 (2016)
Fire & Smoke	EN 45545-2 (2020)
Other	EN 50155 (2021)

Outline drawing







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