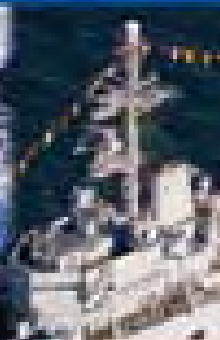
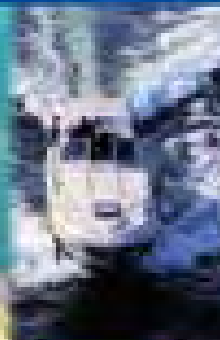
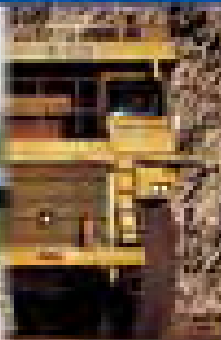


TRANSPORTATION POWER CONVERSION

AERONAUTICS

RAILWAY

MARINE



OFF ROAD

AUTOMOTIVE





MARTEK POWER

MARTEK POWER

Specialized in transportation power supplies, Martek Power offers a broad range of standard AC/DC power supplies, DC/DC converters and DC/AC inverters in a range of 10W to 10kW. To fully satisfy its customer's special needs, Martek Power also designs adapted standard and full custom solutions derived from these standard products.

OUR EXPERIENCE

Our know-how is based on a 40 years experience in the Railway, Automotive, Marine, and Aeronautics industries. Martek Power provides quality power supplies for the most challenging OEM requirements. Moreover, our customers benefit from a strong technical support during all phases of their projects.

OUR PRODUCTS

Martek Power's products are compliant with transportation industry standards. Their reliability in rugged environments is recognized worldwide. They are especially suited to resist shocks and vibrations, and operate under wide temperature ranges.

OUR PRESENCE

With 5 manufacturing facilities and 4 design centers around the world, Martek Power offers its customers a true added value partnership:

- Production flexibility: Martek Power can provide low and high volume production
- Delivery flexibility with transmission of data via EDI and Web
- All sites are ISO 9000 v 2000 certified
- Local engineering support
- Low cost manufacturing





Los Angeles
Engineering and Production •

Mexico
• Production

Great Britain
Sales office •

France
• Engineering
• Engineering and Production

Tunisia
Production •

China
Production •

Hong-Kong
Purchasing office •

International presence
.....

OUR RANGE OF ACTIVITIES

RAILWAY

- Urban transport
- Main line transport
- Freight transport
- Infrastructure

AERONAUTICS

- Civil aircraft
- Military aircraft



OUR RANGE OF ACTIVITIES

AUTOMOTIVE

- Heavy duty trucks
- Off road construction vehicles
- Coaches / buses

MARINE

- Military
- Professional
- Recreational



POWER FOR THE NEW TECHNOLOGY



TGV A

MP 89

TGV POS

TGV DUPLEX

KVB

TGV R

MF 2000

Headlight

TVM and speed control

Passengers lighting

ERTMS

Positioning and radio transmission

Cooling

200 W DC/DC converter

200 W DC/DC converter

220 W DC/DC converter

1600 W DC/DC regulator

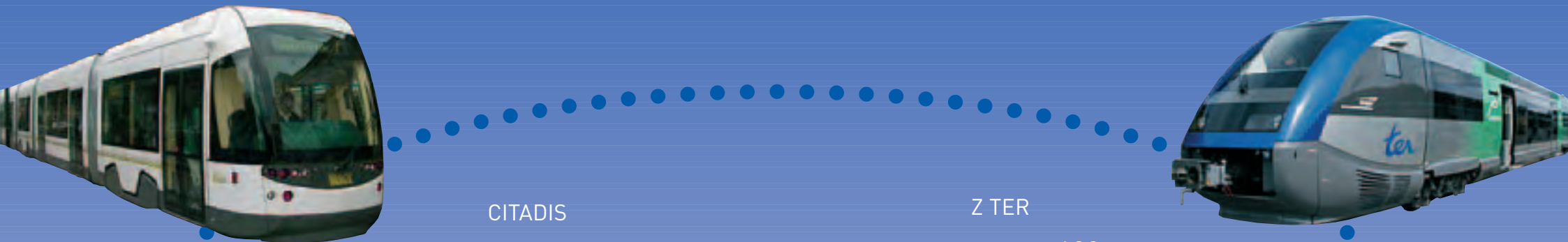
5 to 35 W DC/AC inverters

ERTMS converters

450 VA DC/AC inverter



POWER FOR THE NEW TECHNOLOGY



CITADIS

Z TER

TROLLEY BUS

HILLSIDE

LOCO FRET

AGC

TER 2NNG

CIRCLE LINE

X 40

A TER

Passenger AC plugs

Door safety control

Lighting and radio

Driver devices lighting

Ceiling lighting

Headlight and windshield wiper

100 W DC/DC converter

1200 W DC/DC converter

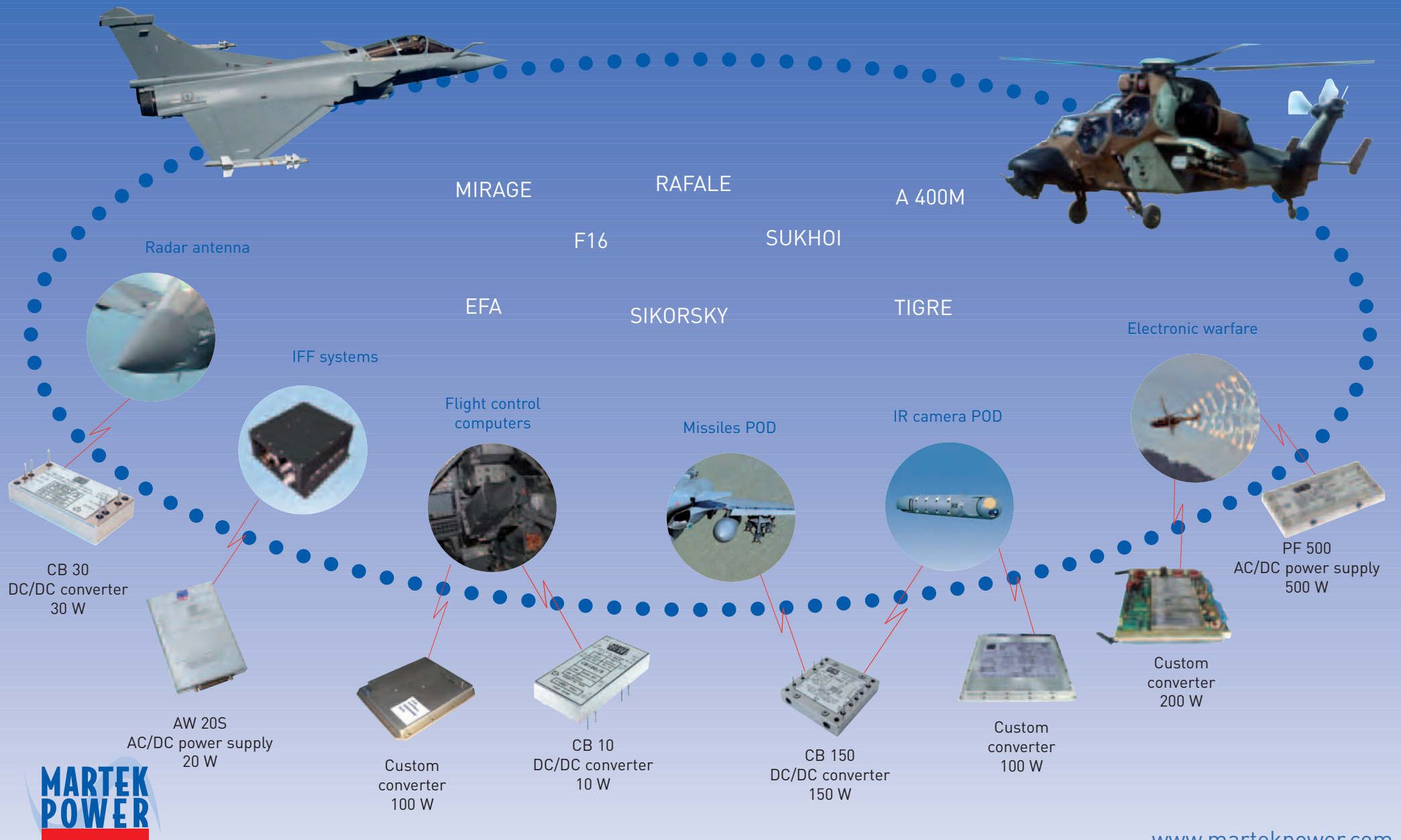
40 W DC/DC converter

80 W DC/DC regulator

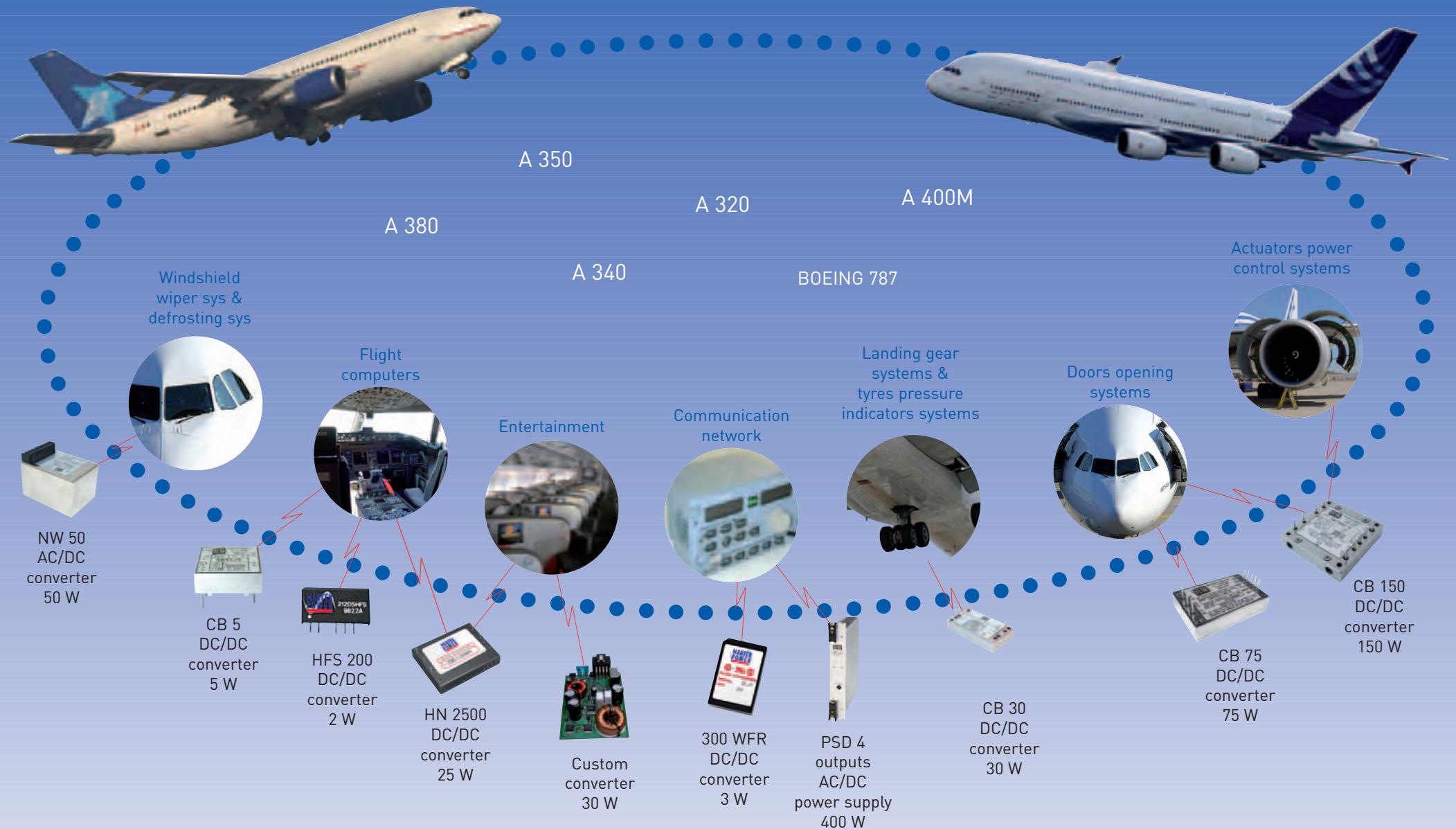
300 to 450 W DC/DC regulator

3 KVA DC/AC inverter

POWER FOR THE NEW TECHNOLOGY



POWER FOR THE NEW TECHNOLOGY



POWER FOR THE NEW TECHNOLOGY



HEAVY DUTY TRUCKS

COACHES



MATERIAL HANDLERS

BUSES

OFF ROAD VEHICLES

UTILITY VEHICLES

AERIAL PLATFORMS

Cabin electrical equipments



Radio communication & entertainment



Displays



Access control & ticketing



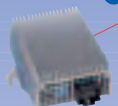
Power management



Video surveillance systems



Interior lights



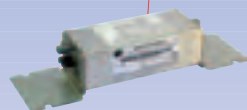
DC/DC converter
150 W



DC/AC inverter
500 W



DC/DC converter
200 W



DC/AC inverter
15 W



Custom converter
70 W



Batteries equalizer
560 W



DC/DC converter
50 W



DC/AC inverter
35 W



www.martekpower.com

PRODUCTS SUMMARY



Sheet number	Series name	Product Ref	Main characteristics						
			Input voltage	Input range	Output voltage	Output current	Power	Size	Main Standards
>> 1	FLUO 24	MPF 007 1D01	24 VDC	16,8 to 30 VDC	Fluorescent tubes supply		7 W	115 x 50 x 42	EN 50155
		MPF 016 2D01	24 VDC	16,8 to 30 VDC			16 W	236 x 50 x 39	EN 50121-3-2
		MPF 035 2D01	24 VDC	16,8 to 30 VDC			35 W	210 x 64 x 39	NF F62-011
>> 2	FLUO 72	MPF 007 1K01	72 VDC	50 to 90 VDC	Fluorescent tubes supply		7 W	115 x 50 x 42	EN 50155
		MPF 016 2K01	72 VDC	50 to 90 VDC			16 W	236 x 50 x 39	EN 50121-3-2
		MPF 035 2K01	72 VDC	50 to 90 VDC			35 W	210 x 64 x 39	NF F62-011
>> 3	FLUO 110	MPF 007 1I01	110 VDC	77 to 137,5 VDC	Fluorescent tubes supply		7 W	115 x 50 x 42	EN 50155
		MPF 016 2I01	110 VDC	77 to 137,5 VDC			16 W	236 x 50 x 39	EN 50121-3-2
		MPF 035 2I01	110 VDC	77 to 137,5 VDC			35 W	210 x 64 x 39	NF F62-011
>> 4		MPF 048 1K01	72 VDC	50 to 90 VDC	5 to 24 VDC adjustable	2 A	48 W	120 x 130 x 40 mm	EN 55011 EN 50155
>> 5	MPF 050	MPF 050 1E01	24-36-48-52 VDC	15 to 65 VDC	12 to 12,4 VDC adjustable	4 A	50 W	89,3 x 63,7 x 22,2 mm	RIA 12
		MPF 050 1K01	72-96-110 VDC	50 to 137,5 VDC	12 to 12,4 VDC adjustable	4 A	50 W	89,3 x 63,7 x 22,2 mm	EN 55011
>> 6	MPF 080	MPF 080 1I01	110 VDC	77 to 137,5 VDC	12 VDC	7 A	84 W	130 x 130 x 40 mm	EN 50155
		MPF 080 1K01	72 VDC	50 to 90 VDC	12 VDC	7 A	84 W	130 x 130 x 40 mm	EN 50121-3-2
>> 7		MPF 105 1D02	24 VDC	16,8 to 30 VDC	28.5 VDC	3.4 A	96,9 W	151 x 88 x 38 mm	EN 55011 EN 50155
>> 8	24/12	MPF 140 1D01	24 VDC	16 to 34 VDC	14 VDC	10 A	140 W	130 x 129 x 40 mm	ISO/DIS 16570-X(1-6)
		MPF 154 2D01	24 VDC	16 to 34 VDC	14 VDC	11 A	154 W	130 x 129 x 40 mm	
		MPF 210 2D01	24 VDC	16 to 34 VDC	14 VDC	15 A	210 W	130 x 129 x 40 mm	
		MPF 280 2D01	24 VDC	16 to 34 VDC	14 VDC	20 A	280 W	130 x 129 x 52 mm	
>> 9	MPF 330 MPF 420	MPF 420 1I03	110 VDC	77 to 137,5 VDC	24 VDC	13 A	312 W	238 x 130 x 70 mm	EN 50155 EN 50121-3
		MPF 420 1I02	110 VDC	77 to 137,5 VDC	72 VDC	4,6 A	331 W	238 x 130 x 70 mm	
		MPF 330 1K02	72 VDC	50 to 90 VDC	27 VDC	12,5 A	338 W	238 x 130 x 70 mm	
>> 10		MPF 500 1D01	24 VDC	18 to 32 VDC	230 VAC	2,17 A	500 W	280 x 220 x 85 mm	GAM EG13 NF C 15-100
>> 11		MPF 560 1D01	24 VDC	16 to 32 VDC	$V_{out}=V_{in}/2$ VDC	40 A	560 W	220 x 112 x 60 mm	GAM EG13 ISO/DIS 16570-X(1-4)
>> 12		MPF 1K0 1I01	110 VDC	77 to 137,5 VDC	72 VDC	13,9 A	1kW	360 x 70 x 120 mm	EN 50155 STME 001 NF F16-101/102 NF F 01-510
>> 13		MPF 3K0 1I01	110 VDC	77 to 137,5 VDC	230 VAC	8,5 A	3 kVA	4U x 84TE x 350 mm	EN 50155
>> 14	AERONAUTICS PRODUCTS								

PRODUCTS SUMMARY



Sheet number	Series name	Main characteristics						
		Input voltage	Input range	Output voltage	Number of outputs	Power	Size	Main Standards
>> 15	MBR	24, 36, 52, 72, 110VDC	See datasheet	Fixed outputs can be specified from 5 to 30VDC	1, 2 or 3	15W	80,5 x 72 x 31 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 16	JL JLH	Can be specified between 24 and 110VDC	From 60% to 125% of nominal	Fixed outputs can be specified from 5 to 110VDC	1 or 2	35W JL 50W JLH	220 x 73 x 30 mm	EN 50155 EN 50121-3-2
>> 17	SQ	110VDC	66V - 137VDC	Fixed outputs can be specified from 3,3V to 24VDC	1	50W	256 x 80 x 25 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 18	DR	24, 36, 52, 72, 83, 110VDC	See datasheet	Fixed outputs can be specified from 5V to 30VDC	1, 2 or 3	55W	3U x 8TE x 168,5 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 19	JLSP	24, 36, 52, 72, 110VDC	See datasheet	Fixed outputs can be specified from 5V to 30VDC	1 or 2	60W	160 x 110,5 x 20 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 20	SRE	24, 36, 52, 72, 110VDC	See datasheet	Fixed outputs can be specified from 5V to 48VDC	1	100W		EN 50155 EN 50121-3-2
>> 21	SR	24, 36, 52, 72, 83, 110VDC	See datasheet	Fixed outputs can be specified from 5V to 30VDC	1 or 2	120W	160 x 111 x 20 mm	EN 50155 EN 50121-3-2 IEC 60571
>> 22	ER	24, 36, 52, 72, 110VDC	See datasheet	Fixed outputs can be specified from 5V to 30VDC	1 or 2	150W	3U x 9TE x 168,5 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2 IEC 60571
>> 23	NS	24, 52, 72, 110VDC	From 60% to 125% of nominal	Fixed outputs can be specified from 5 to 110VDC	1	200W NSL 400W NSH	260 x 160 x 75 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 24	ACR 250	24, 52, 72, 110VDC	From 60% to 125% of nominal	240VAC 50Hz	1	250W	280 x 180 x 100 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2 LUL G6621
>> 25	ATG	24, 36, 52, 72, 110VDC	From 70% to 125% of nominal	Fixed outputs can be specified from 12 to 110VDC	1	300W	238 x 130 x 60 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 26	ACR 750	24, 52, 72, 110VDC	From 60% to 125% of nominal	230VAC 50Hz	1	750W	330 x 250 x 145 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 27	ASP	24, 52, 72, 110VDC	From 60% to 125% of nominal	230VAC 50Hz	1	750W	490 x 250 x 130 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2
>> 28	AT	24, 52, 72, 110VDC	From 60% to 125% of nominal	Fixed outputs can be specified from 5 to 110VDC	1 or 2	800W	335 x 340 x 80 mm	RIA 12,13,18,20 EN 50155 EN 50121-3-2



FLUO 24 DC/AC INVERTERS

Description

This series of inverters is designed to supply interior fluorescent tubes in rolling stocks applications. Depending on its different versions, it is possible to supply 1 or 2 tubes from 5 W to 35 W.

MPF 007 1D01



MPF 016 2D01



MPF 035 2D01



Input Specifications

Product reference	All references
Nominal input voltage	24 VDC
Input voltage range	16,8 to 30 VDC
Input transients voltage	14,4 V-33,6 V / 100 ms
Reverse input voltage protection	Yes, by serial diode
Inrush current limitation	< 20 In

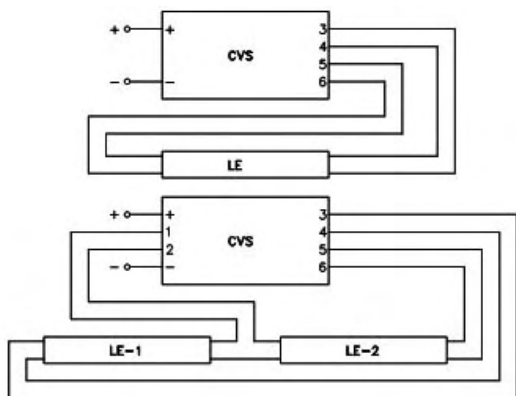
Output Specifications

Product reference	MPF 007 1D01	MPF 016 2D01	MPF 035 2D01
Output signal	Sinus		
Output frequency	30 to 85 kHz		
Dimming	No	No	Yes
Nominal output power (depending on applications)	5 to 7 W	5 to 16 W	14 to 35 W
Efficiency	> 74%		
Thermal protection	No		
Overvoltage protection	Yes		
Permanent short circuit protection	Yes		

Product reference	MPF 007 1D01	MPF 016 2D01	MPF 035 2D01
Fluorescent tubes configuration	PL-S PRO 5W or similar PL-S PRO 6W or similar PL-S PRO 7W or similar	PL-S PRO 5W or similar (1 or 2 tubes) TL Mini PRO 8W or similar (1 or 2 tubes)	TL5 35W or similar (1 tube) TL5 28W or similar (1 tube) TL5 21W or similar (1 tube) TL5 14W or similar (1 or 2 tubes)

Environmental Details

Product reference	All references
Operating temperature range	-25°C to +55°C
Ambient temperature around the product	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +75°
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	> 10 MΩ / 500 VDC
Dielectric strength	1 500 Vrms between input+output and ground
MTBF (according to UTE C 80 801)	GM 40°C: 300 000 h
Burn in (ON-OFF test)	100 000 cycles
Coating	PCB coated with varnish
Protection index	IP40





Applicable Norms

Item	Reference	Level	Compliance
EMC	EN 50121-3-2		X
Radiated emissions	EN 55011	Class A radiated	X
Conducted emissions	EN 55011	Class A + 20 dB conducted	X
Vibrations	EN 61373	category 1, mounted in cabin (class B)	X
Shocks	NFF 62011	1/2 sinus pulse (18 ms, 30 m/s)	X
Electrostatic discharges	EN 61000-4-2	D.E.S 6 kV contact, 8 kV in the air	X
Radiated immunity	EN 61000-4-3	20 V/m	X
Fast transients	EN 61000-4-4	2 kV	X
Conducted perturbations	EN 61000-4-6	3 Vrms	X
Surge	EN 50155	5/50µs 1800 V	X
Electronic equipments used into rolling-stocks	STM-E-001		X

Mechanical Characteristics

Product reference	MPF 007 1D01	MPF 016 2D01	MPF 035 2D01
Box material	Aluminium		
Potting	No		
Dimension	115 x 50 x 42	236 x 50 x 39	210 x 64 x 39
Weight	< 200 g	< 290 g	< 310 g
Fixing	4 x Ø5,5 mm	2 x Ø5,5 mm	4 x Ø5,5 mm
Input connector	6,35 faston clamps		
Output connector	LMI compatible connector		

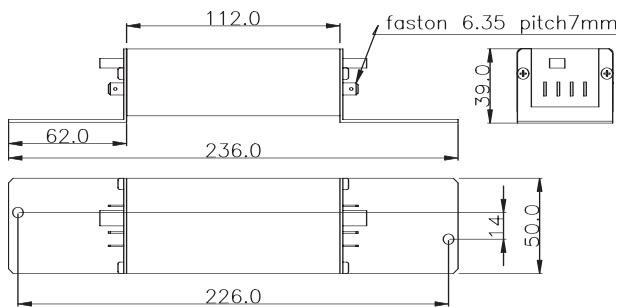
Pinout: According to norm (XPF 61-031: connectors for transistor ballasts)

Technical Drawing

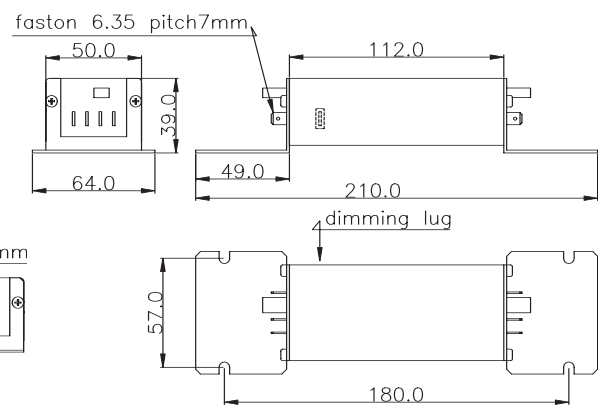
NOTES

- All dimensions in mm
- Specifications subject to change without notification
-
- Different sizes available for braces

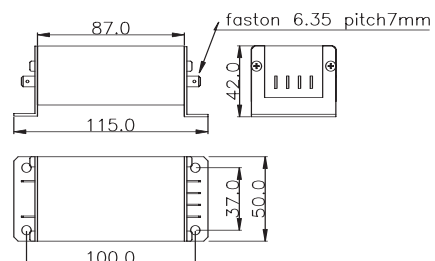
MPF 016 2D01



MPF 035 2D01



MPF 007 1D01





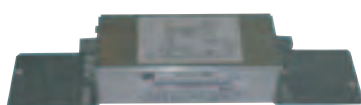
FLUO 72

DC/AC INVERTERS

MPF 007 1K01



MPF 016 2K01



MPF 035 2K01



Description

This series of inverters is designed to supply interior fluorescent tubes in rolling stocks applications. Depending on its different versions, it is possible to supply 1 or 2 tubes from 5 W to 35 W.

Input Specifications

Product reference	All references
Nominal input voltage	72 VDC
Input voltage range	50,4 to 90 VDC
Input transients voltage	43 VDC, 101 VDC during 100 ms
Reverse input voltage protection	Yes, by serial diode
Inrush current limitation	< 20 In

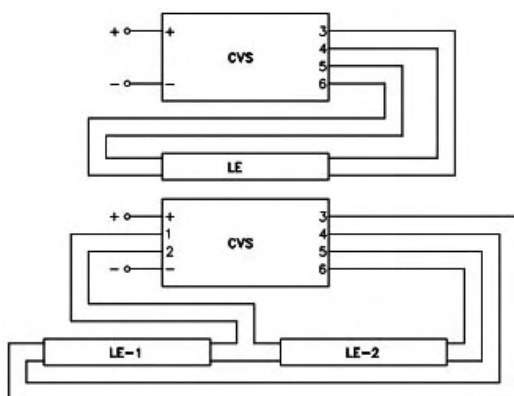
Output Specifications

Product reference	MPF 007 1K01	MPF 016 2K01	MPF 035 2K01
Output signal	Sinus		
Output frequency	30 to 85 kHz		
Dimming	No	No	Yes
Nominal output power (depending on applications)	5 to 7 W	5 to 16 W	14 to 35 W
Efficiency	> 74%		
Thermal protection	No		
Overvoltage protection	Yes		
Permanent short circuit protection	Yes		

Product reference	MPF 007 1K01	MPF 016 2K01	MPF 035 2K01
Fluorescent tubes configuration	PL-S PRO 5W or similar PL-S PRO 6W or similar PL-S PRO 7W or similar	PL-S PRO 5W or similar (1 or 2 tubes) TL Mini PRO 8W or similar (1 or 2 tubes)	TL5 35W or similar (1 tube) TL5 28W or similar (1 tube) TL5 21W or similar (1 tube) TL5 14W or similar (1 or 2 tubes)

Environmental Details

Product reference	All references
Operating temperature range	-25°C to +55°C
Ambient temperature around the product	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +75°
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	> 10 MΩ / 500 VDC
Dielectric strength	1 500 Vrms between input+output and ground
MTBF (according to UTE C 80 801)	GM 40°C: 300 000 h
Burn in (ON-OFF test)	100 000 cycles
Coating	PCB coated with varnish
Protection index	IP40





Applicable Norms

Item	Reference	Level	Compliance
EMC	EN 50121-3-2		X
Radiated emissions	EN 55011	Class A radiated	X
Conducted emissions	EN 55011	Class A + 20 dB conducted	X
Vibrations	EN 61373	category 1, mounted in cabin (class B)	X
Shocks	NFF 62011	1/2 sinus pulse (18 ms, 30 m/s)	X
Electrostatic discharges	EN 61000-4-2	D.E.S 6 kV contact, 8 kV in the air	X
Radiated immunity	EN 61000-4-3	20 V/m	X
Fast transients	EN 61000-4-4	2 kV	X
Conducted perturbations	EN 61000-4-6	3 Vrms	X
Surge	EN 50155	5/50µs 1800V	X
Electronic equipments used into rolling-stocks	STM-E-001		X

Mechanical Characteristics

Product reference	MPF 007 1K01	MPF 016 2K01	MPF 035 2K01
Box material	Aluminium		
Potting	No		
Dimension	115 x 50 x 42	236 x 50 x 39	210 x 64 x 39
Weight	< 200 g	< 290 g	< 310 g
Fixing	4 x Ø5,5 mm	2 x Ø5,5 mm	4 x Ø5,5 mm
Input connector	6,35 faston clamps		
Output connector	LMI compatible connector		

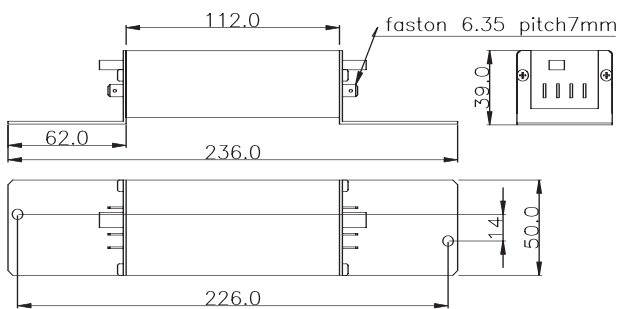
Pinout: According to norm (XPF 61-031: connectors for transistor ballasts)

Technical Drawing

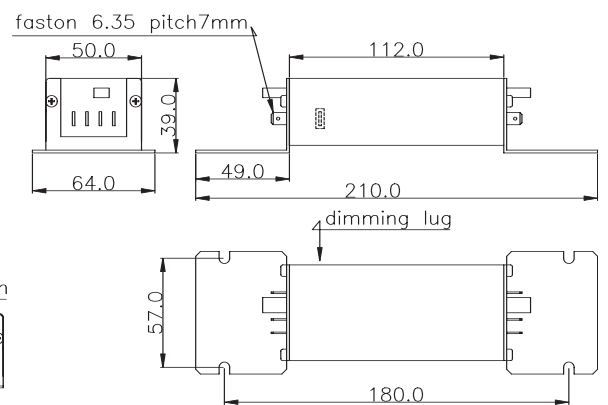
NOTES

- All dimensions in mm
- Specifications subject to change without notification
-
- Different sizes available for braces

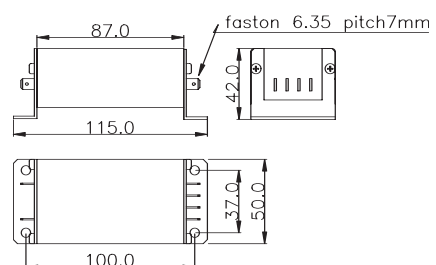
MPF 016 2K01



MPF 035 2K01



MPF 007 1K01





FLUO 110

DC/AC INVERTERS

Description

This series of inverters is designed to supply interior fluorescent tubes in rolling stocks applications. Depending on its different versions, it is possible to supply 1 or 2 tubes from 5 W to 35 W.

MPF 007 1101



MPF 016 2101



MPF 035 2101



Input Specifications

Product reference	All references
Nominal input voltage	110 VDC
Input voltage range	77 to 137,5 VDC
Input transients voltage	66 V - 154 V during 100 ms
Reverse input voltage protection	Yes, by serial diode
Inrush current limitation	< 20 In

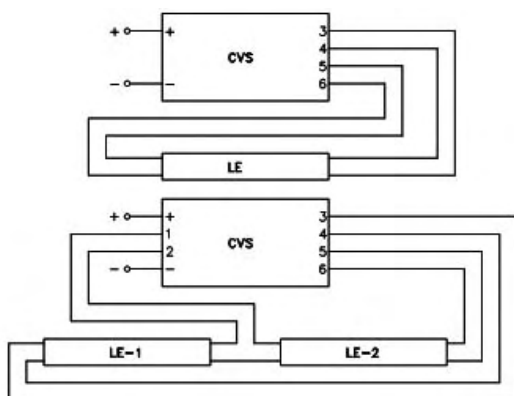
Output Specifications

Product reference	MPF 007 1101	MPF 016 2101	MPF 035 2101
Output signal	Sinus		
Output frequency	30 to 85 kHz		
Dimming	No	No	Yes
Nominal output power (depending on applications)	5 to 7 W	5 to 16 W	14 to 35 W
Efficiency	> 74%		
Thermal protection	No		
Overvoltage protection	Yes		
Permanent short circuit protection	Yes		

Product reference	MPF 007 1101	MPF 016 2101	MPF 035 2101
Fluorescent tubes configuration	PL-S PRO 5W or similar PL-S PRO 6W or similar PL-S PRO 7W or similar	PL-S PRO 5W or similar (1 or 2 tubes) TL Mini PRO 8W or similar (1 or 2 tubes)	TL5 35W or similar (1 tube) TL5 28W or similar (1 tube) TL5 21W or similar (1 tube) TL5 14W or similar (1 or 2 tubes)

Environmental Details

Product reference	All references
Operating temperature range	-25°C to +55°C
Ambient temperature around the product	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +75°
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	> 10 MΩ / 500 VDC
Dielectric strength	1 500 Vrms between input+output and ground
MTBF (according to UTE C 80 801)	GM 40°C: 300 000 h
Burn in (ON-OFF test)	100 000 cycles
Coating	PCB coated with varnish
Protection index	IP40





Applicable Norms

Item	Reference	Level	Compliance
EMC	EN 50121-3-2		X
Radiated emissions	EN 55011	Class A radiated	X
Conducted emissions	EN 55011	Class A + 20 dB conducted	X
Vibrations	EN 61373	category 1, mounted in cabin (class B)	X
Shocks	NFF 62011	1/2 sinus pulse (18 ms, 30 m/s)	X
Electrostatic discharges	EN 61000-4-2	D.E.S 6 kV contact, 8 kV in the air	X
Radiated immunity	EN 61000-4-3	20 V/m	X
Fast transients	EN 61000-4-4	2 kV	X
Conducted perturbations	EN 61000-4-6	3 Vrms	X
Surge	EN 50155	5/50µs 1800 V	X
Electronic equipments used into rolling-stocks	STM-E-001		X

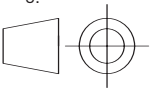
Mechanical Characteristics

Product reference	MPF 007 1101	MPF 016 2101	MPF 035 2101
Box material	Aluminium		
Potting	No		
Dimension	115 x 50 x 42	236 x 50 x 39	210 x 64 x 39
Weight	< 200 g	< 290 g	< 310 g
Fixing	4 x Ø5,5 mm	2 x Ø5,5 mm	4 x Ø5,5 mm
Input connector	6,35 faston clamps		
Output connector	LMI compatible connector		

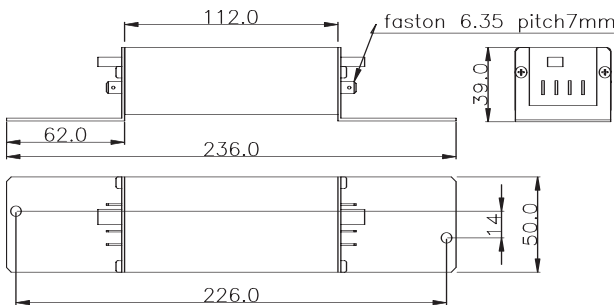
Pinout: According to norm (XPF 61-031: connectors for transistor ballasts)

Technical Drawing

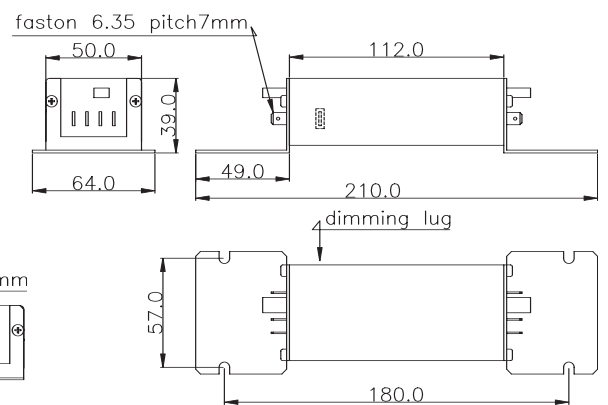
NOTES

- All dimensions in mm
- Specifications subject to change without notification
- 
- Different sizes available for braces

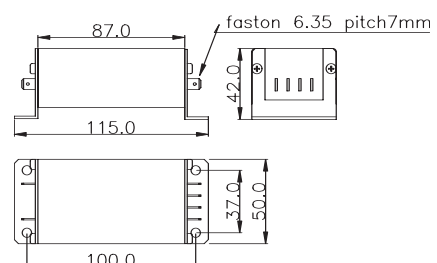
MPF 016 2101



MPF 035 2101



MPF 007 1101





MPF 048 1K01

DC/DC CONVERTER



Description

This converter is designed to supply control equipments in locomotives. It is possible to adjust output voltage from 5 VDC to 24 VDC with an external potentiometer.

Input Specifications

Product reference	MPF 048 1K01
Nominal input voltage	72 VDC
Input voltage range	50 to 90 VDC
Input transients voltage	43 VDC during 100 ms 101 VDC during 1 s
Reverse input voltage protection	Yes, by reverse diode + external micro circuit breaker
Inrush current limitation	Yes, by NTC

Output Specifications

Product reference	MPF 048 1K01
Nominal output voltage	From 5 to 24 VDC
Output voltage ripple p-p (WB 0 to 30 MHz)	< 100 m V
Nominal output current	2 A
Crossed regulation (load + line)	< 5%
Nominal output power	48 W
Efficiency	70% under 5 VDC 80% under 24 VDC
Thermal protection	No
Switching frequency	> 50 kHz, fixed
Output current limitation	< 1,2 I nominal
Overvoltage protection	No
Permanent short circuit protection	Yes

Environmental Details

Product reference	MPF 048 1K01
Operating temperature range	-25°C to +70°C
Derating	No
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	>100MΩ, 500 VDC (Input / Output)
Dielectric strength	2 100 VDC (Input / Ground)
MTBF (UTE C 80-810)	> 1 000 000 h at 40°C
Coating	PCB coated with varnish
Protection index	IP 20



Applicable Norms

Item	Reference	Level	Compliance
Conducted emissions	EN 55011	A	X
Electrostatic discharges	EN 61000-4-2	6 kV contact	X
Radiated immunity. Magnetic field	EN 61000-4-3	20 V/m	X
Fast transients	EN 61000-4-4	2 kV	X
Burst common mode and differential mode	EN 61000-4-5	2 kV	X
Radiated immunity. Inductive magnetic field	EN 61000-4-6	3 Vrms	X
Railway	EN 50155		X
Salt spray test	EN 68000-2-11		X
Damp heat test	EN 68000-2-30		X
Cold test	EN 68000-2-1		X
Dry heat test	EN 68000-2-1		X

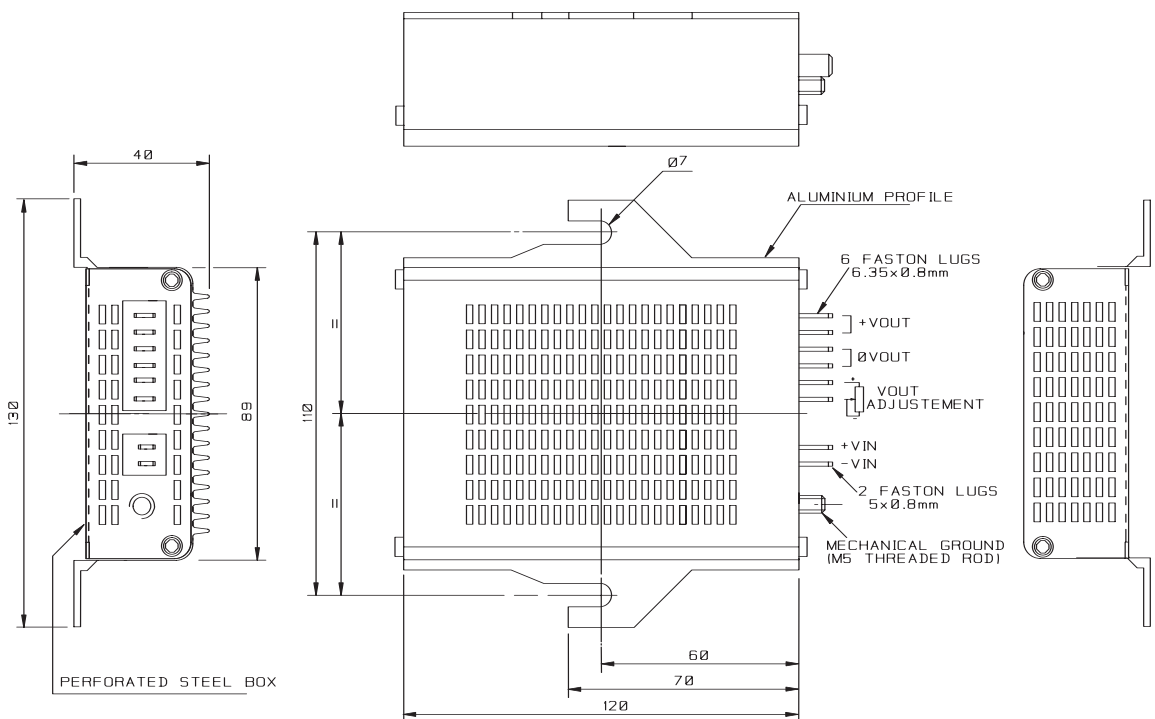
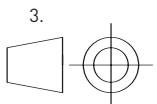
Mechanical Characteristics

Product reference	MPF 048 1K01
Box material	Extruded in aluminium
Potting	No
Dimension	120 x 130 x 40 mm
Weight	450 g
Fixing	2 x Ø7 mm
Input connector	Faston
Output connector	Faston

Technical Drawing

NOTES

- All dimensions in mm
- Specifications subject to change without notification





MPF 050 SERIES

DC/DC CONVERTER



Description

This wide input voltage range DC/DC converter series allows to supply 12 VDC products with 24 VDC to 110VDC electrical installations. These converters are compliant to railway standard RIA 12.

Input Specifications

Product reference	MPF 050 1 E 01	MPF 050 1 K 01
Nominal input voltage	24/36/48/52 VDC	72/96/110
Input voltage range	15 to 65 VDC	50 to 137.5 VDC
Input transients voltage	14,4 VDC, 73 VDC during 100 ms	43 VDC, 154 VDC during 100 ms
Reverse input voltage protection	Yes, by reverse diode	Yes, by reverse diode
Inrush current limitation	Yes, by resistor+ MOSFET	Yes, by resistor+ MOSFET

Output Specifications

Product reference	MPF 050 1E01 & MPF 050 1K01
Nominal output voltage	12.4 VDC Adjustable to 12 VDC with soldered connection
Output voltage ripple p-p (WB 0 to 20 MHz)	120 mV, (fundamental 40 mV)
Nominal output current	4 A, minimum 0.4A
Crossed regulation (load + line)	± 1%
Nominal output power	50 W
Efficiency	> 85%
Long term stability during 8 hours (after 1/2 hour operating)	< 0.3%
Switching frequency	> 50 kHz, fixed
Output current limitation	> 4,8 A
Overvoltage protection	Yes, by Transil
Permanent short circuit protection	Yes

Environmental Details

Product reference	MPF 050 1E01 & MPF 050 1K01
Operating temperature range	-25°C to +80°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ / °C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	> 10 MΩ (500 VDC)
Dielectric strength	1 500 VAC (input/output)
MTBF (according to "MIL HDBK.217F")	> 228 000 hours
Coating	PCB coated with varnish



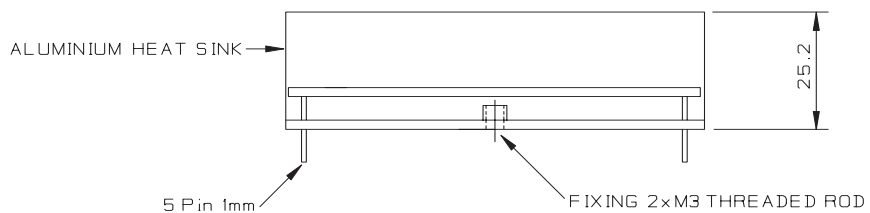
Applicable Norms

Item	Reference	Level	Compliance
Conducted + radiated emissions	EN 55011	A	X
Radiated immunity.	EN 61 000-4-3	20 V/m	X
Fast transients immunity	EN 61 000-4-4	± 2 kV	X
Surge immunity	EN 61 000-4-5	± 1,8 kV	X
Conducted disturbance immunity	EN 61 000-4-6	10 Vrms	X
Railway	RIA 12		X

Mechanical Characteristics

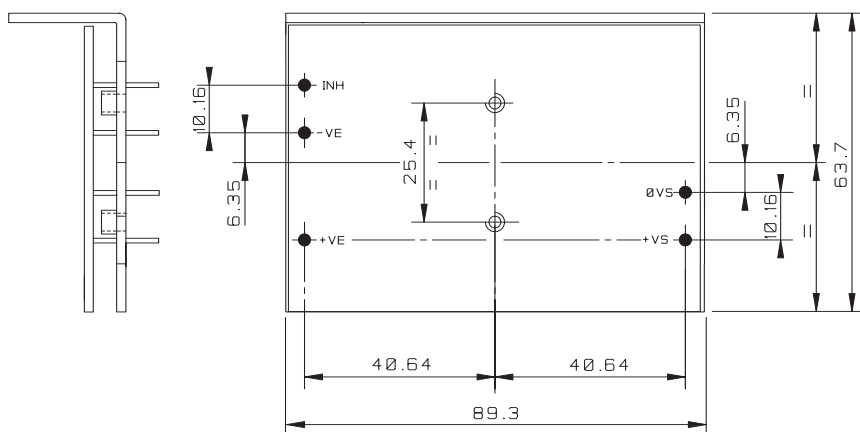
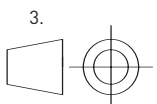
Product reference	MPF 050 1E01 & MPF 050 1K01
Box	PCB on aluminium plate
Potting	No
Dimension	89,3 x 63,7 x 22,2 mm
Fixing	2 x M3 threaded rods
Input connector	Soldered pin
Output connector	Soldered pin

Technical Drawing



NOTES

1. All dimensions in mm
2. Specifications subject to change without notification





MPF 080 SERIES

NON-ISOLATED DC/DC CONVERTER



Description

This railway standards compliant halogen lamp lighting converter (non-isolated DC/DC converter) is for use inside train vans and locomotive cabins. The input voltage is available in either 72 V or 110 VDC and the output voltage is available in 12 VDC 80 W. It has natural convection and is railway standards compliant EN 50155 and EN 50121-3-2.

Input Specifications

Product reference	MPF 080 1K01	MPF 080 1I01
Nominal input voltage	72 VDC	110 VDC
Input voltage range	50 to 90 VDC	77 to 137,5 VDC
Input transients voltage	43 VDC, 101 VDC during 100 ms	66 VDC, 154 VDC during 100 ms
Reverse input voltage protection	Yes, by reverse diode	
Inrush current limitation	< 10 In	

Output Specifications

Product reference	MPF 080 1K01 & MPF 080 1I01
Nominal output voltage	12 VDC
Output voltage ripple p-p (WB 0 to 30 MHz)	250 mV
Nominal output current	7A
Crossed regulation (load + line)	± 2%
Nominal output power	84 W
Efficiency	85%
Long term stability during 8 hours (after 1/2 hour operating)	< 0.3%
Switching frequency	> 40 kHz, fixed
Output current limitation	> 8.2 A
Overvoltage protection	Yes, by Transil 1.5 KE
Permanent short circuit protection	Yes

Environmental Details

Product reference	MPF 080 1K01 & MPF 080 1I01
Operating temperature range	-25°C to +85°C
Derating	Without derating
Storage temperature range	-40°C to +70°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	Up to 95% non-condensing
Cooling	Natural convection
Insulation resistance	> 100MΩ under 500V between Input + output and ground
Dielectric strength	1500 VAC between primary + secondary and ground
MTBF (according to "MIL HDBK.217F")	GM 40°C: 100 000 h
Coating	PCB coated with varnish
Protection index	IP 20



Applicable Norms

Item	Reference	Level	Compliance
Railway rolling stocks applications	EN 50 155		X
EMC	EN 50121-3-2		X
Electrostatic discharges	EN 61000-4-2		X
Radiated immunity. Magnetic field	EN 61000-4-3	10 V/m	X
Fast transients	EN 61000-4-4	2 kVCM	X
Burst common mode and differential mode	EN 61000-4-5		X
Radiated immunity, inductive magnetic field	EN 61000-4-6		X

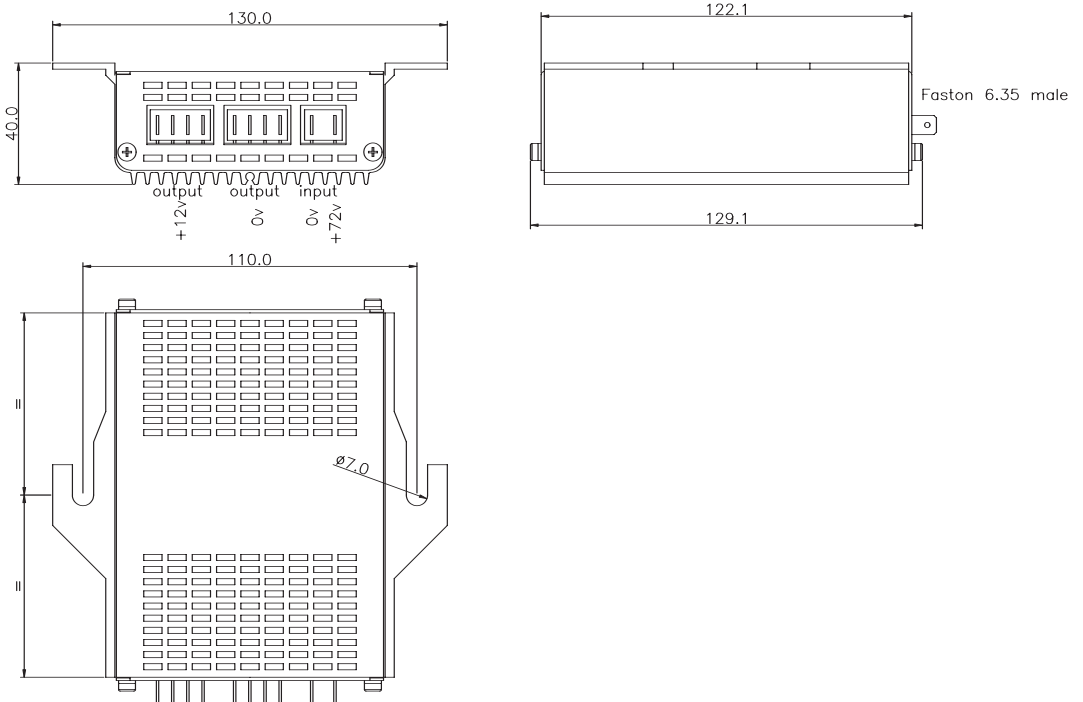
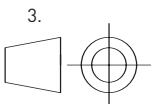
Mechanical Characteristics

Product reference	MPF 080 1K01 & MPF 080 1I01
Box material	Aluminium and inox steel
Potting	No
Dimension	130 x 40 x 130 mm
Weight	465 g
Fixing	Using the box profil
Input connector	6,35 Faston
Output connector	6,35 Faston

Technical Drawing

NOTES

- All dimensions in mm
- Specifications subject to change without notification





MPF 105 1D02

DC/DC CONVERTER



Description

Designed to supply doors security systems, this isolated-DC/DC converter adapts 24 V voltage into 28 V. This converter is compliant with railway standards.

Input Specifications

Product reference	MPF 105 1D02
Nominal input voltage	24 VDC
Input voltage range	16,8 to 30 VDC
Input transients voltage	14,4 VDC, 33,6 VDC during 100 ms
Reverse input voltage protection	Yes, by reverse diode
Inrush current limitation	< 10 In

Output Specifications

Product reference	MPF 105 1D02
Nominal output voltage	28.5 VDC
Output voltage ripple p-p (WB 0 to 30 MHz)	285 mV
Nominal output current	3.4 A
Crossed regulation (load + line)	1%
Nominal output power	96,9 W
Efficiency	> 85%
Long term stability during 8 hours (after 1/2 hour operating)	< 0.3%
Thermal protection	No
Switching frequency	> 25 kHz, fixed
Output current limitation	> 4.4 A
Oversvoltage protection	Yes, by Transil
Permanent short circuit protection	Yes
Power Good	Dry contact closed
	Green LED on

Environmental Details

Product reference	MPF 105 1D02
Operating temperature range	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 45°C	95%
Cooling	Natural convection
Insulation resistance	> 100 MΩ (500 VDC)
Dielectric strength	500 VAC between primary / secondary + signal
	500 VAC between primary + secondary + signal / ground
MTBF (according to UTE C 80810)	> 620 000 h at 40°C
Coating	PCB coated with varnish
Protection index	IP 20



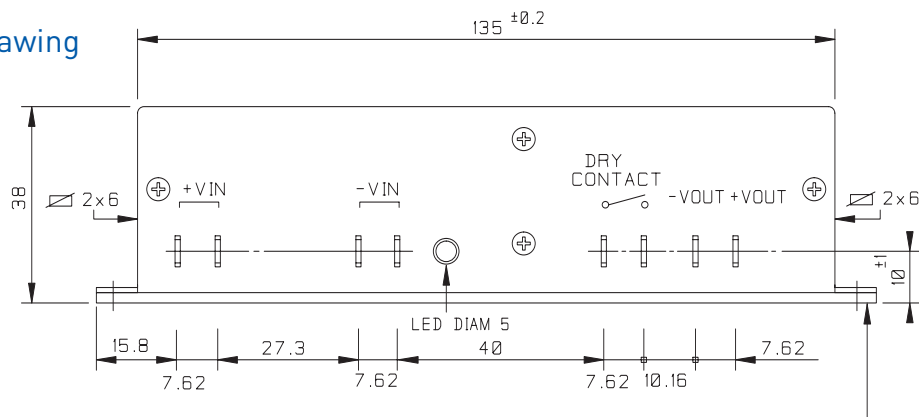
Applicable Norms

Item	Reference	Level	Compliance
Conducted + radiated emissions	EN 55011		X
Railway rolling stocks applications	EN 50155		X
Electrostatic discharges	EN 50121-3-2		X
Vibrations	EN 61373		X

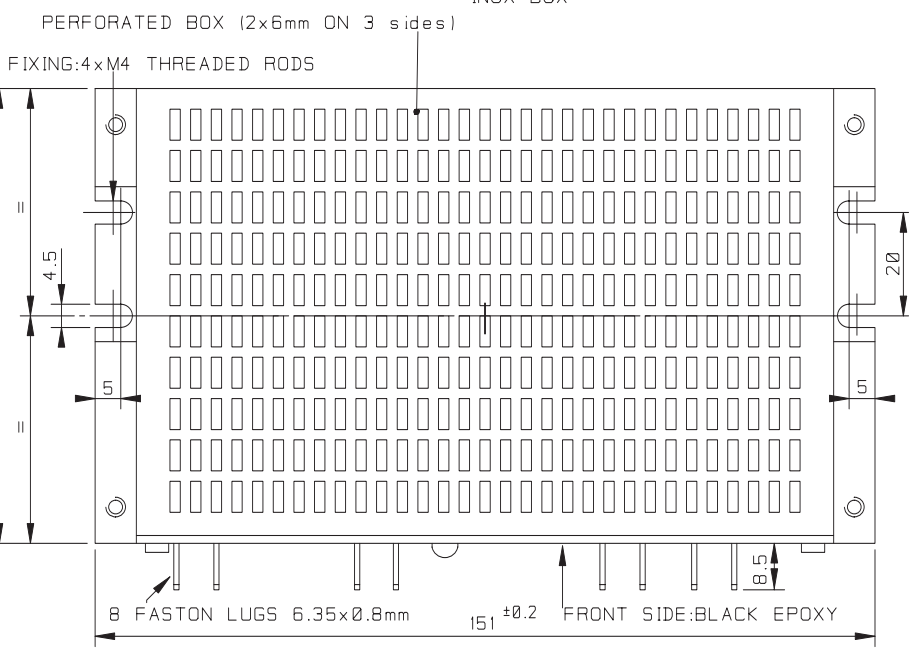
Mechanical Characteristics

Product reference	MPF 105 1D02
Box material	PCB on aluminium plate (2 mm), inox box
Potting	No
Dimension	151 x 88 x 38 mm
Weight	410 g
Fixing	4 x M3 threaded rods
Input connector	4 Faston 6,35 x 0,8
Output connector	2 Faston 6,35 x 0,8
Power Good connector	2 Faston 6,35 x 0,8

Technical Drawing



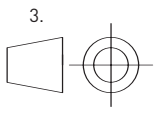
INOX BOX



FIXING REQUIREMENT:
THE PLATE MUST BE FIX ON A METALLIC SURFACE.
USE OF THERMIC GREASE IS NOT NECESSARY.

NOTES

1. All dimensions in mm
2. Specifications subject to change without notification

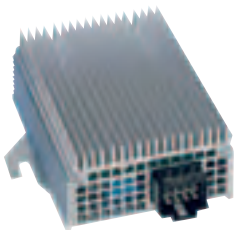




24/12 SERIES

NON-ISOLATED DC/DC CONVERTERS

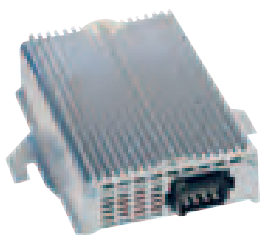
MPF 280 2D01



MPF 210 2D01



MPF 154 2D01



MPF 140 1D01



Description

Specially designed for truck, bus or off-road construction vehicles markets, this DC/DC converter allows customers to use 12 VDC electric equipments with a 24 VDC original installation. This series offers several output powers, depending on customer applications.

Input Specifications

Product reference	All references
Nominal input voltage	24 VDC
Input voltage range	16 to 34 VDC
Input transients voltage	36 V during 2 h 48 V during 2 min
Reverse input voltage protection	Yes (30 V continuous)

Output Specifications

Product reference	MPF 140 1D01	MPF 154 2D01	MPF 210 2D01	MPF 280 2D01
Nominal output voltage	14 VDC			
Output voltage ripple p-p (WB 0 to 30 MHz)	150 mV			
Maximal output current	10 A	11 A	15 A	20 A
Crossed regulation (load + line)	± 0.7 V	± 0.7 V	± 0.7 V	± 0.7 V
Nominal output power	140 Watt	154 Watt	210 Watt	280 Watt
Efficiency	> 92%			
Long term stability during 8 hours (after 1/2 hour operating)	< 0.3%			
Thermal protection	No			
Switching frequency	> 25 kHz, fixed			
Output current limitation	1,2 In			
Overvoltage protection	Yes, by fuse			
Permanent short circuit protection	Yes			

NB: When the supply voltage is 8V the converter must deliver at least 1A under 5V

Environmental Details

Product reference	All references
Operating temperature range	-40 to +70°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	93%
Cooling	Natural convection
Insulation resistance	No
Dielectric strength	No
MTBF (according to "MIL HDBK.217F")	GM 40°C: > 90 000 h
Coating	PCB coated with varnish
Protection index	IP 20



Applicable Norms

Item	Reference	Level	Compliance
	ISO/DIS 16750-X (1, 2, 5, 6)		X
Vibrations and shocks	ISO/DIS 16750-3 (F)		X
Climatic load	ISO/DIS 16750-4	-40°C to +70°C	X
EMC	CISPR 25		X

Mechanical Characteristics

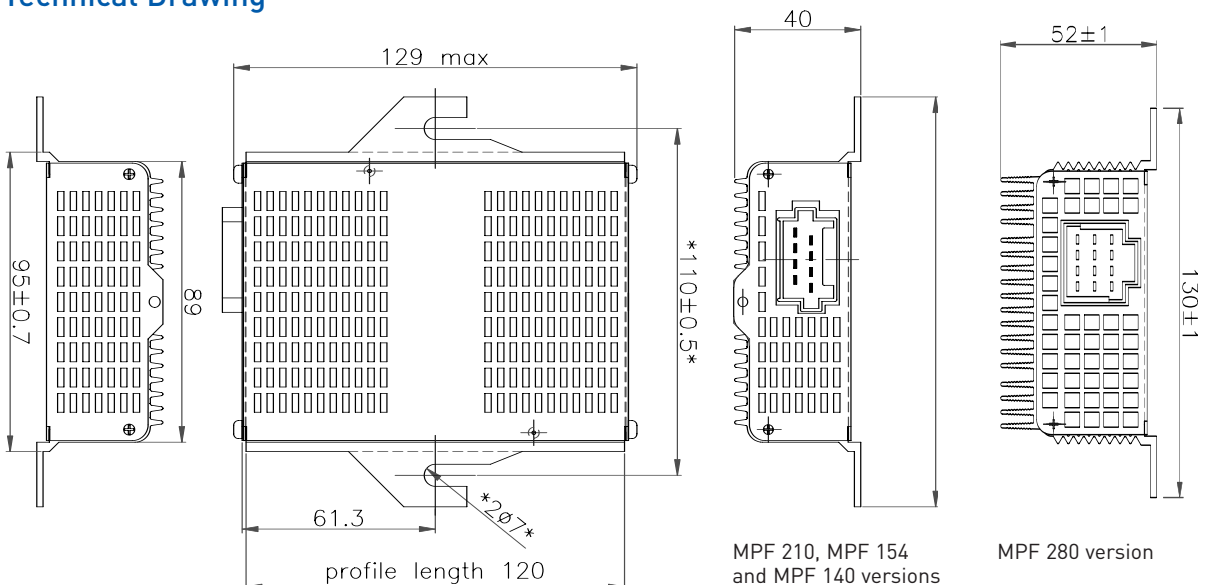
Product reference	MPF 140 1D01	MPF 154 2D01	MPF 210 2D01	MPF 280 2D01
Box material	Aluminium			
Potting	No			
Dimension	130 x 129 x 40 mm			130 x 129 x 52 mm
Weight	< 500 g		< 550 g	
Fixing	2 x Ø7 mm			
Input connector	FCI RT 94BR08WH*T	AMP 82 88 01-3	AMP 82 88 01-4	AMP 96 61 40-3

Pinout:

Product reference	MPF 140 1D01	MPF 154 2D01	MPF 210 2D01	MPF 280 2D01
1	+Vin	+Vin accessory	-Vin	+VOut2 accessory
2	GND (Vin)	+VOut2 accessory	+Vin power	+VOut2 accessory
3	+VOut	+VOut1 power	+Vin accessory	+V accessory
4	GND (VOut)	+VOut1 power	+VOut1 power	+VOut1 power
5	+VOut	+VOut1 power	GND	+VOut1 power
6	GND (VOut)	GND (VOut)	+VOut1 power	GND
7	NC	GND (Vin)	GND	+Vin power
8	NC	Vin power	+VOut2 accessory	GND
9			+VOut2 accessory	GND
10			+VOut2 accessory	+Vin power
11				GND
12				GND

Technical Drawing

- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification
 -





MPF 330 & MPF 420 SERIES

NON-ISOLATED DC/DC CONVERTERS



Description

The MPF 330 W and MPF 420 W are non isolated DC/DC converters designed to power the headlights, windshield wipers or other equipments on board trains. They allow the adaptation of railway approved 72 V input products into a 110 V input. Inputs are available in 72 V and 110 VDC and outputs in 24 V, 27 V and 72 VDC.

Model 110 V/72 V is the ideal railway application adaptor to feed 72 VDC devices from a 110 VDC input. Both converters are compliant to railway standards EN 50155 and EN 50121-3-2.

Input Specifications

Product reference	MPF330 1K02	MPF 420 1102	MPF 420 1103
Nominal input voltage	72 VDC	110 VDC	
Input voltage range	50 to 90 VDC	77 to 137,5 VDC	
Input transients voltage	43 VDC, 101 VDC during 100 ms	66 VDC, 154 VDC during 100 ms	
Reverse input voltage protection	Yes, by reverse diode		
Inrush current limitation	Yes		

Output Specifications

Product reference	MPF330 1K02	MPF 420 1102	MPF 420 1103
Nominal output voltage	27 V	72 V	24 V
Output voltage ripple p-p (WB 0 to 30 MHz)	500 mV		
Nominal output current	12.5 A	4.6 A	13 A
Crossed regulation (load + line)	± 5%		
Nominal output power	338 W	331 W	312 W
Efficiency	> 85%		
Long term stability during 8 hours (after 1/2 hour operating)	< 0.3%		
Switching frequency	> 25 kHz, fixed		
Output current limitation	< 1,2 I _n		
Overload protection	Yes, over current = red LED on		
Overvoltage protection	Yes		
Permanent short circuit protection	Yes		
Power Good	By dry contact when Output voltage is ok		Green LED on

Environmental Details

Product reference	All references
Operating temperature range	-20°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	Up to 95% non condensing
Cooling	Natural convection
Insulation resistance	No insulation
Dielectric strength	1500 VAC between Input + output and ground
MTBF (according to "MIL HDBK.217F")	GM 40°C: 200 000 h
Coating	PCB coated with varnish
Protection index	IP 20



Applicable Norms

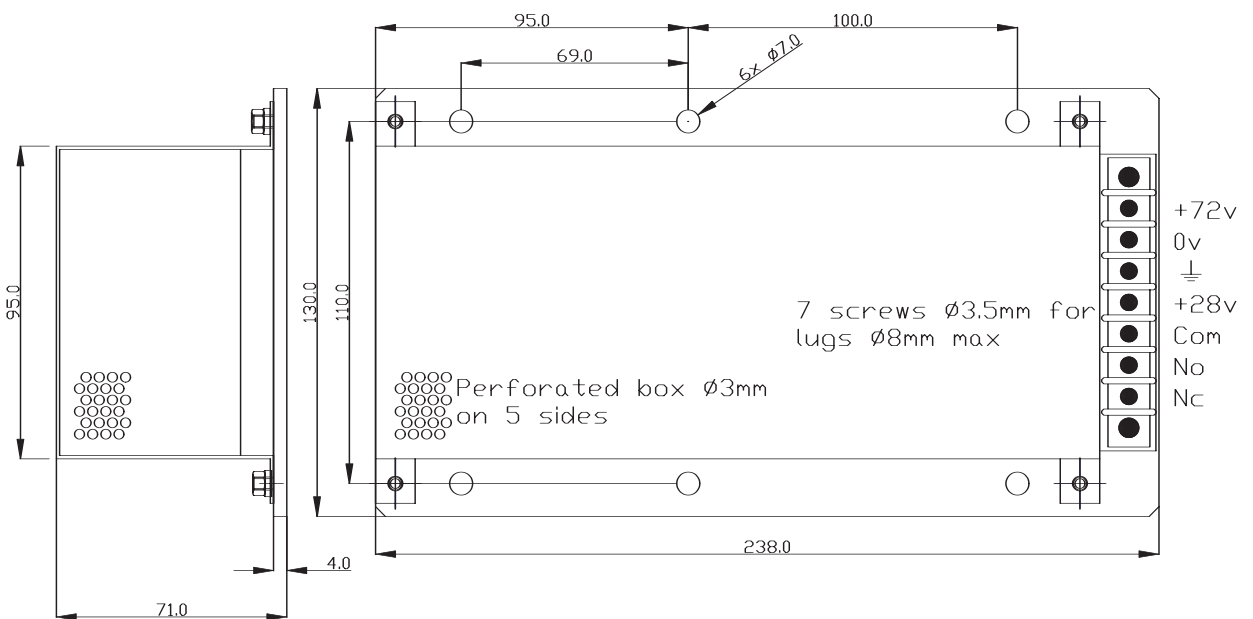
Item	Reference	Level	Compliance
Railway rolling stocks	EN 50 155		X
EMC	EN 50 121-3		X
Railway rolling stocks	NFF 67 001		X
Railway rolling stocks	NFF 01 510		X

Mechanical Characteristics

Product reference	All references
Box material	Metal
Potting	No
Dimension	238 x 130 x 70 mm
Weight	1,25 kg
Fixing	6 x Ø7 mm
Input connector	Screw terminal
Output connector	Screw terminal

Technical Drawing

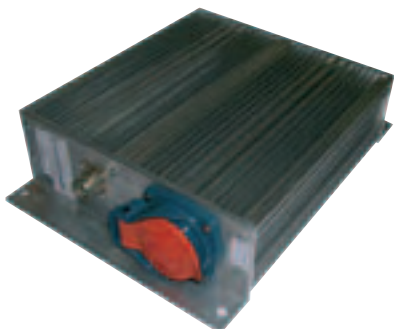
- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification
 -





MPF 500 1D01

DC/AC INVERTER



Description

This inverter DC/AC 230 V is dedicated to supply AC equipments in mobile vehicles. Qualified for military applications, this inverter is waterproof and has a strong resistance to shocks and vibrations.

Input Specifications

Product reference	MPF 500 1D01
Nominal input voltage	24 VDC
Input voltage range	18 to 32 VDC
Reverse input voltage protection	Yes, by reverse diode
Inrush current limitation	Yes, > 10 In

Output Specifications

Product reference	MPF 500 1D01
Nominal output voltage	230 VAC
Nominal frequency	50 Hz
Wave shape	Sinus or quasi sinus
Nominal output current	2,17 A
Crossed regulation (load + line)	± 10%
Nominal output power	500 W
Cos φ	0,7
Efficiency	> 80%
Thermal protection	Yes
Output current limitation	> 2,9 A
Permanent short circuit protection	Yes

Environmental Details

Product reference	MPF 500 1D01
Operating temperature range	-20°C to +70 °C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	> 95%
Cooling	Natural convection
Insulation resistance	> 7 MΩ under 500VDC between input + ground and output
Dielectric strength	2200 VAC between input and output
MTBF (MIL HDBK.217 F)	GF 25°C: > 50 000 hours
Coating	PCB coated with varnish
Protection index	IP44



Applicable Norms

Item	Reference	Level	Compliance
Broad band: radiation	GAM EG13	test 62 R3 curve A1 board 14	X
Broad band: conduction	GAM EG 13	test 62 C2 curve A1 board 4	X
Narrow band :radiation	GAM T13	parts 62 R1E and 62 R1L	X
Narrow band: conduction	GAM T13	parts 62 C1E and 62 C1L	X

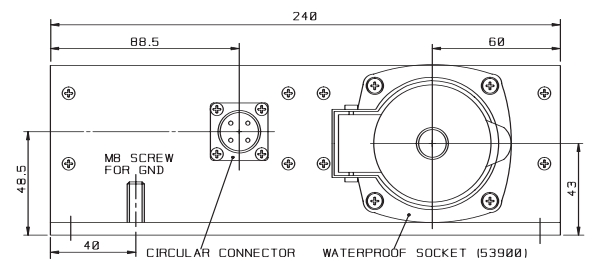
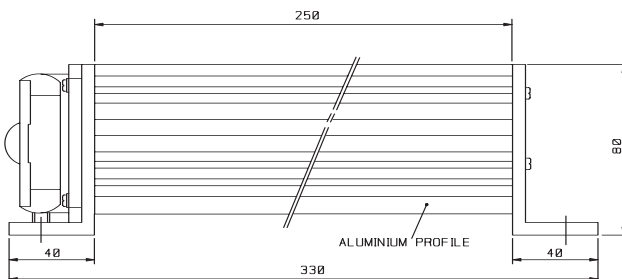
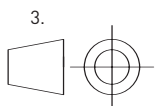
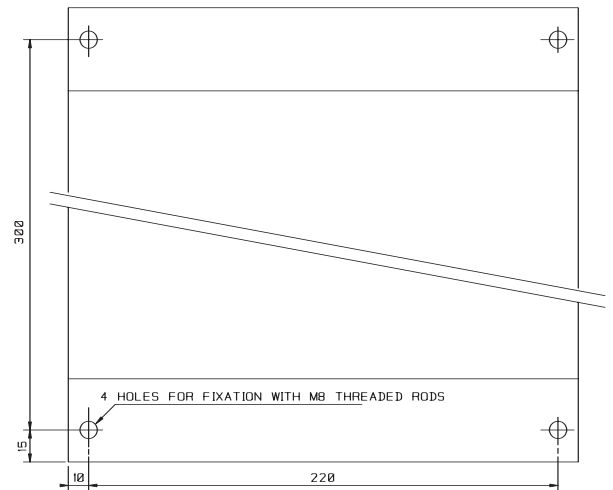
Mechanical Characteristics

Product reference	MPF 500 1D01
Box material	Extruded aluminium
Potting	Yes
Dimension	280 x 220 x 85 mm
Fixing	4 screws Ø 4.2 mm
Input connector	Circular connector (3 male pins)
Output connector	CE waterproof socket (53900 or equivalent)

Technical Drawing

NOTES

1. All dimensions in mm
2. Specifications subject to change without notification





MPF 560 1D01

NON-ISOLATED DC/DC CONVERTER



Description

This automotive battery equalizer allow the use of two serial batteries (starting battery and auxiliary battery) guarantying a balanced discharge and a longer battery life.

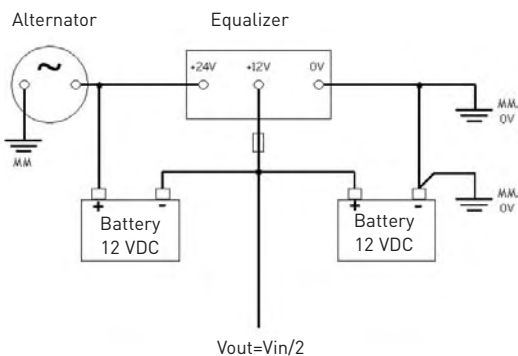
Input Specifications

Product reference	MPF 560 1D01
Nominal input voltage	24 VDC
Input voltage range	16 to 32 VDC
Input transients voltage	14,4 VDC to 33,6 VDC during 100 ms
Reverse input voltage protection	Yes, by serial MOSFET
Inrush current limitation	< 10 In
Overvoltage protection	Yes, by Gemov V36ZA80

Output Specifications

Product reference	MPF 560 1D01
Nominal output voltage	$V_{out}=V_{in}/2$ VDC
Output voltage ripple p-p (WB 0 to 30 MHz)	150 mV
Nominal output current	40 A
Crossed regulation (load + line)	± 2%
Nominal output power	560 W
Efficiency	> 95%
Long term stability during 8 hours (after 1/2 hour operating)	< 0,3%
Thermal protection	No
Output current limitation	> 48 A
Overvoltage protection	Yes
Permanent short circuit protection	Yes

Bloc diagram



Environmental Details

Product reference	MPF 560 1D01
Operating temperature range	-32°C to +85°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< $2 \cdot 10^{-4}$ /°C
Relative humidity at 40°C	93%
Cooling	Natural convection
Insulation resistance	No
Dielectric strength	No
MTBF UTE C 80-810	GM 40°C: > 1 000 000 h
Coating	PCB coated with varnish
Protection index	IP 65



Applicable Norms

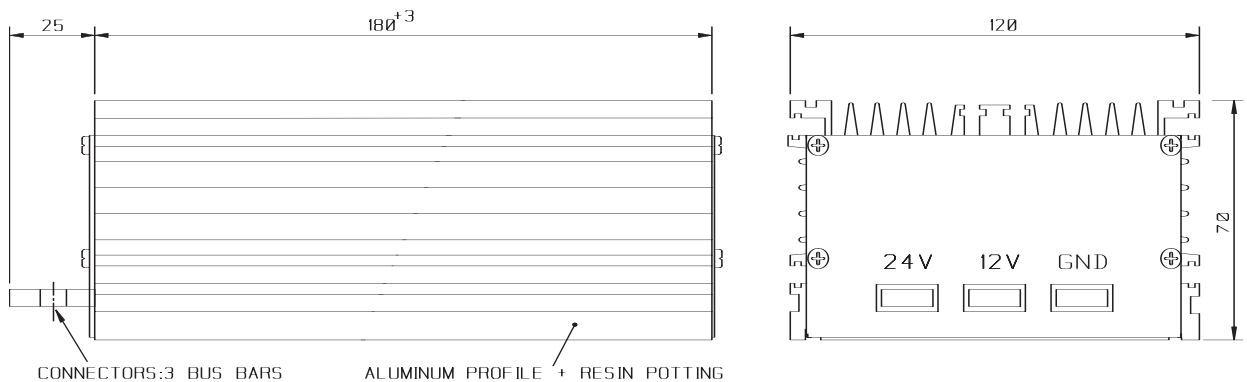
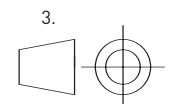
Item	Reference	Level	Compliance
Vibrations and shocks	GAM EG13	parts 41, 42, 43	X
EMC	GAM EG13B	part 61 M1 harshness 3	X
EMC	GAM EG13B	part 61 M2 harshness 3	X
Radiation	GAM EG13B	hardened test 62 R3	X
Conduction	GAM EG13B	test 62 C2 curve A1	X
	ISO/DIS 16750-X (1 to 4)		X

Mechanical Characteristics

Product reference	MPF 560 1D01
Box material	Extruded in aluminium
Potting	Yes
Dimension	220 x 112 x 60 mm
Weight	< 2,6 kg
Fixing	Using the box profile
Input connector	3 Bus bars
Output connector	

Technical Drawing

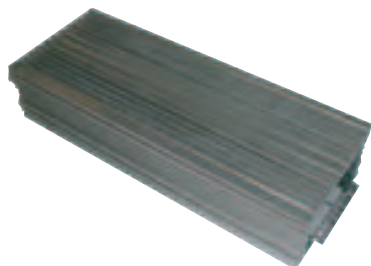
- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification





MPF 1K0 1101

NON-ISOLATED DC/DC CONVERTER



Description

The 1kW railway application adaptor (non-isolated DC/DC converter) transforms 110 VDC voltage into 72 VDC. This unit allows the use of railway approved 72 VDC input products with 110 VDC input. It has natural convection and complies with railway standards EN 50155 and EN 50121-3-2.

Input Specifications

Product reference	MPF 1K0 1101
Nominal input voltage	110 VDC
Input voltage range	77 to 137,5 VDC
Input transients voltage	66 VDC, 154 VDC during 100 ms
Overvoltage protection	Yes, by transil 1,5 KE 150 V
Reverse input voltage protection	Yes, with reverse diode
Inrush current limitation	< 10 In

Output Specifications

Product reference	MPF 1K0 1101
Nominal output voltage	72 VDC
Output voltage ripple p-p (WB 0 to 30 MHz)	500 mV
Nominal output current	13,9A
Crossed regulation (load + line)	± 5%
Nominal output power	1000 W
Efficiency	95%
Long term stability during 8 hours (after 1/2 hour operating)	< 0,3%
Switching frequency	25kHz, fixed
Output current limitation	17A
Overvoltage protection	Yes, by transil BZW50-82 5 kW
Permanent short circuit protection	Yes
Power Fail	Dry contact open when VOut < 50 V Green LED off

Environmental Details

Product reference	MPF 1K0 1101
Operating temperature range	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +85°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	95%
Cooling	Natural convection
Insulation resistance	100MΩ (500 VDC) between input output / case
Dielectric strength	1 500 Vrms between input output and box
MTBF (according to "MIL HDBK.217F")	GB 40°C: >4 000 000 h GM 40°C: >227 000 h
Coating	PCB coated with varnish





Applicable Norms

Item	Reference	Level	Compliance
Railway rolling stocks applications	EN 50 155		X
Electronic equipments used into rolling stocks	STME 001		X
Fire and smokes	NF F16-101/102		X
Electrostatic discharges	EN50121-3-2		X
Vibrations	EN61373		X
Transients response	NFC 42801 C		X

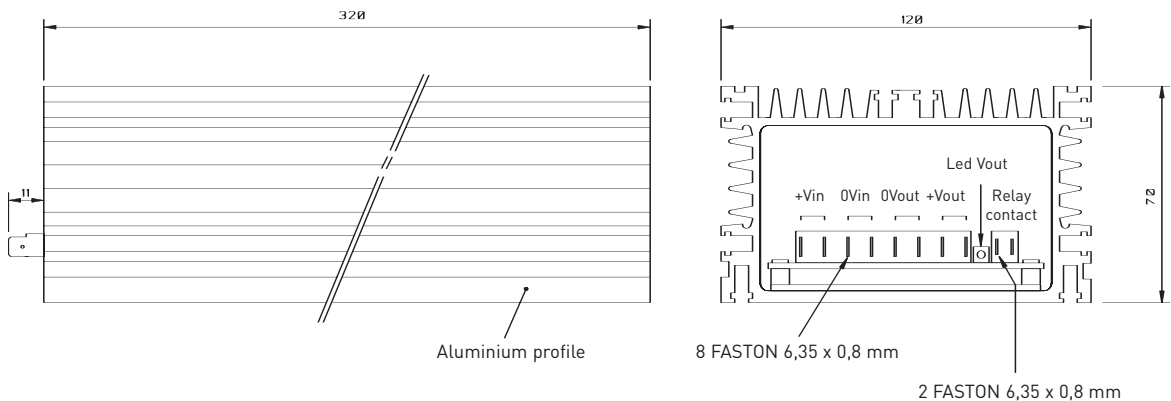
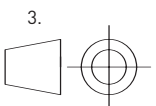
Mechanical Characteristics

Product reference	MPF 1K0 1I01		
Box material	aluminium		
Potting	No		
Dimension	360 x 70 x 120 mm		
Fixing	Using the box profil		
Input connector	8 Faston 6,35 x 0,8 mm		
Output connector	2 Faston 6,35 x 0,8 mm		
Signals details	Power Fail		2 Faston 6,35 x 0,8 mm

NOTES

Technical Drawing

- All dimensions in mm
- Specifications subject to change without notification





MPF 3K0 1101

DC/AC INVERTER



Description

The 3kVA railway application inverter provides 230 VAC power to train passengers. It has an input of 110 VDC and an output of 230 VAC 50Hz. It is fan cooled and complies with railway standards EN 50155 and EN 50121-3-2. Its standard size facilitates its integration in electric cabinets.

Input Specifications

Product reference	MPF 3K0 1101
Nominal input voltage	110 VDC
Input voltage range	77 to 137,5 VDC
Input transients voltage	66 VDC, 154 VDC during 100 ms
Reverse input voltage protection	Yes, by reverse diode
Inrush current limitation	8 x In during 1ms at 120 VDC 3 kVA

Output Specifications

Product reference	MPF 3K0 1101
Nominal output voltage	230 VAC
Nominal output current	8,5 A
Crossed regulation (load + line)	± 10%
Nominal output power	3 kVA
Cos φ	< 0,65
Harmonic distortion	< 8%
Efficiency	> 85%
Long term stability during 8 hours (after 1/2 hour operating)	< 0,3%
Thermal protection	Yes
Switching frequency	> 25 kHz, fixed
Output current limitation	> 15,6 A
Permanent short circuit protection	Yes, 120% I max

	Enable	To switch on the equipment 77 V to 140 V input range	Green LED
Power Good	VOK	To control the converter by monitoring the output voltage value. Relay dry contact. When V out > 150 VAC, VOK is on	Green LED
	DIFOK	To control the converter by monitoring the status of the differential. When Differential OK, DIFOK is on	Green LED

Environmental Details

Product reference	MPF 3K0 1101
Operating temperature range	-25°C to +70°C
Derating	Without derating
Storage temperature range	-40°C to +70°C
Temperature coefficient	< 2.10 ⁻⁴ /°C
Relative humidity at 40°C	Up to 98% non condensing
Cooling	Internal fan
Insulation resistance	100 MΩ / 500 VDC
Dielectric strength	1 500 V rms
MTBF (according to "MIL HDBK.217F")	GM 40°C: > 90 000 h
Protection index	IP 20





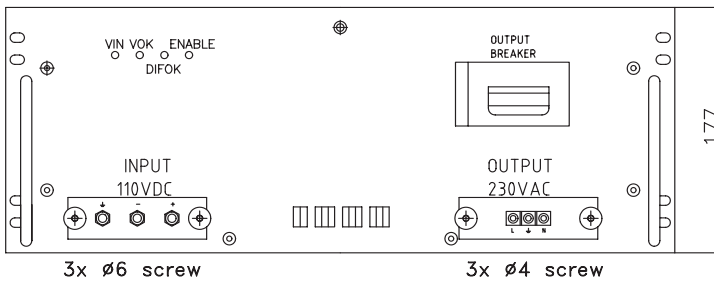
Applicable Norms

Item	Reference	Level	Compliance
EMC	EN 61000-4-X (2 to 6); EN 50121		X
Environmental	EN 60068-2, EN 60068-2-X (6 & 27)		X
Safety	EN 50 155; NF F 16101; NF F 16102		X

Mechanical Characteristics

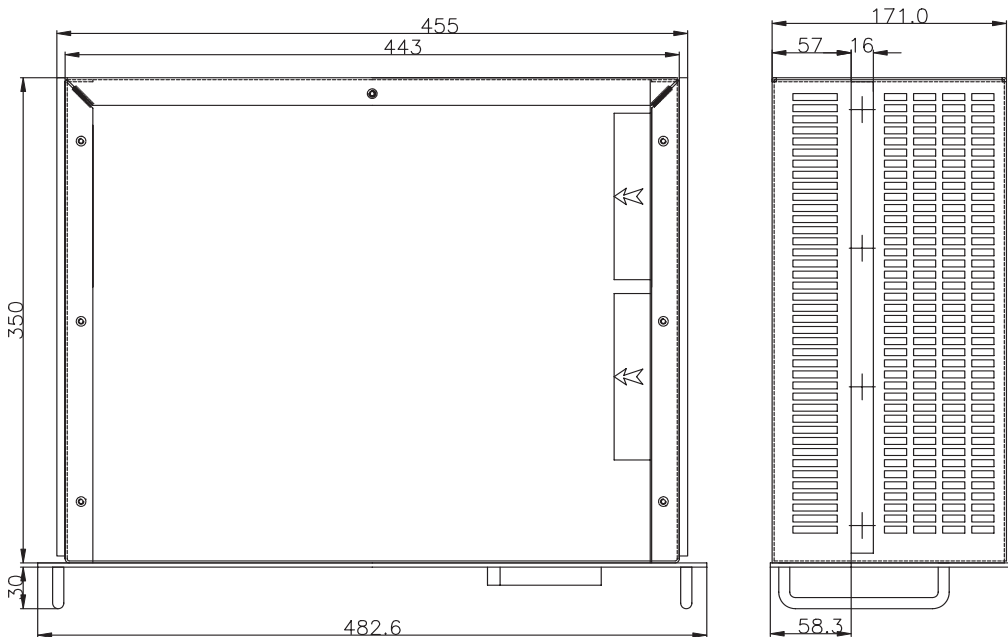
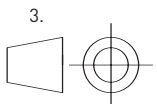
Product reference	MPF 3K0 1101		
Box material	Metal		
Potting	No		
Dimension	4U x 84TE x 350 mm		
Weight	< 20 kg		
Fixing	On the rack		
Input connector	M6 threaded rods		
Output connector	Screw terminal		
Signals details	Input voltage > 77 VDC	Green LED on front panel	
	Enable	Green LED on front panel	
	VOK V out > 150 VAC	Green LED on front panel	
	DIFOK differential ok	Green LED on front panel	

Technical Drawing



NOTES

1. All dimensions in mm
2. Specifications subject to change without notification

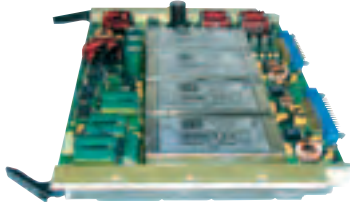




Standard modules



Custom products



Description

With a complete range of AC/DC, DC/DC, and DC/AC standard modules, Martek Power designs and produces modified standard products and full custom products. The applications are both for military and civil sectors.

Military Products

DC/DC converters			
Series	Power (Watt)	Input	Outputs
CB *	5-75	16-40 VDC	Output voltages; 2, 3.3, 5, 5.2, 12, 15, 24, 28, 48 VDC Available with 1, 2 or 3 outputs depending on versions
NL *	50-150	9-18 VDC	
NH *	50-150	200-400 VDC	
NB *	15-150	14-40 VDC	
HSM200S	200	200-400 VDC	
SM	50-280	18-36 & 200-400 VDC	
AB & RB	20-200	14-32 VDC	
AW & RW	20-200	90-160 VDC	
AM & RM	50-100	100-300 VDC	

AC/DC Power Supplies				
Series	Power (Watt)	Input		Outputs
		Voltage	Frequency (kHz)	
NW	25-50	90-130 VAC	47-440 single phase	Output voltages; 2, 3.3, 5, 5.2, 12, 15, 24, 28, 48 VDC Available with 1, 2 or 3 outputs depending on versions
AW & RW	20-200	103-127 VAC	47-440 single phase	
AM & RM	50-100	90-130 VAC 180-260 VAC	47-440 single phase Triple phase	
M	300	103.5-126.5 VAC	47-440 single phase	
MH	500	110 & 230 VAC	47-440 single phase	
PFC*	500-1000	85-265 VAC	47-630 single phase	
HM	200-800	90-260 VAC	1 to 3 phases	270 VDC

DC/AC Inverters			
Series	Power (Watt)	Input	Outputs
S	5-60	24-30 VDC	27 or 115 VAC, 400-1600 Hz, sine wave
SN	180, 350 on request	24-30 VDC	400-1600 Hz, sine wave

* Also available in industrial version



Industrial Products

DC/DC converters									
Series	Power (Watt)	Package		Input					Outputs
		Non-encapsulated	Encapsulated	5V	12V	24V	48V	Other	
HFS	1 to 2		x	x	x	x			Available with output voltages: 3.3, 5, 9, 12, 15, ±5, ±9, ±12, ±15 VDC and with 1, 2 or 3 outputs depending on versions
WFS	2 to 3		x	x	x	x	x		
WFR	3 to 5		x		x	x	x		
HN	8 to 10	x			x	x	x	4 to 1	
HN	10 to 15	x		x	x	x	x		
LN	10 to 15	x					x		
HN	17 to 25	x			x	x	x		
LN	17 to 25	x					x		
HN	27	x			x		x		
HN	26 to 40	x			x	x	x		
HDI	33 to 60		x		x	x	x		
HDI	50 to 75		x			x	x		
MCS	72 to 144		x		x	x	x	72 & 110 VDC	
MR	20 to 144		x		x	x	x	4 to 1	
ECS	144	x				x	x	72 & 110 VDC	
PVD	230	x					x	5, 12 VDC	
PS	1400	x					x	5, 48 VDC	

Industrial Products

For more information concerning full custom AC/DC, DC/DC, PFC products, please contact our sales representatives.

We can ensure:

- Engineering & development
- Manufacturing according to
 - ISO 9001-2000
 - IPC 610
 - EN 9100 (current)

Applicable Norms

According to product references:

NOTES

1. Specifications subject to change without notification

Item	Reference	Compliance
EMC & transients	MIL STD 461	X
	MIL STD 704-D	X
	MIL STD 704-E	X
	MIL STD 1275	X
	DO 160	X
	ABD 100	X
	AMD 24	X
	Stanag	X
	EG 13	X
Mechanical	MIL STD 810 E	X
	MIL STD 202	X



15 W MBR SERIES

DC/DC CONVERTER

Description

The MBR series consists of low power (up to 15W) encapsulated converters, which incorporate full surge and transient protection to RIA12 and EN50155. They are available in single, dual and triple output versions, with nominal inputs from 24V up to 110V. Normally supplied with pins for PCB mounting, they are also available with flying leads for bulkhead mounting.



Special features include:

- Fully protected to rail norms
- Rugged encapsulated construction
- Up to three outputs
- Wide input range

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)

Other ranges are available to order

Product reference	All references
Input Ripple	To RIA 13 and EN50155
Input Protection	Reverse polarity protection. Surges and transients to BRB/RIA 12 & EN50155
Inrush Current	Limited to typically 5 x nominal current (after 0.1ms)
Efficiency	75% typical

Output Specifications

Product reference	All references
Maximum Output Power	up to 15W
Output Versions	Single, Dual and Triple
Output Voltage	Can be specified from 5V to 30V
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C
Minimum Load	Typically zero for all outputs, although in some cases a minimum load of up to 5% on U1 for full performance
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of Output Voltage
Output Noise	<50mV Pk-Pk superimposed (up to 20MHz)
Response Time	1.0ms to within 2% (for a 20% - 90% load change)
Output Protection	All outputs protected against indirect transients to BRB/RIA 12
Output Current Limit	Operates at a minimum of 110% of nominal loading.
Primary Power Limit	Operates at approximately 120% of full power
Isolation	Input to Output 2.0kV ac Input to Earth 1.0kV ac Output to Earth 1.0kV ac Output to Output 250V dc



Environmental Details

Product reference	All references
Operating Temperature	-25°C to +65°C (no derating)
Storage Temperature	-40°C to +85°C
Relative Humidity	99% max.
Sealing	IP65
Vibration	RIA 13, RIA 20 Cat. 1

Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

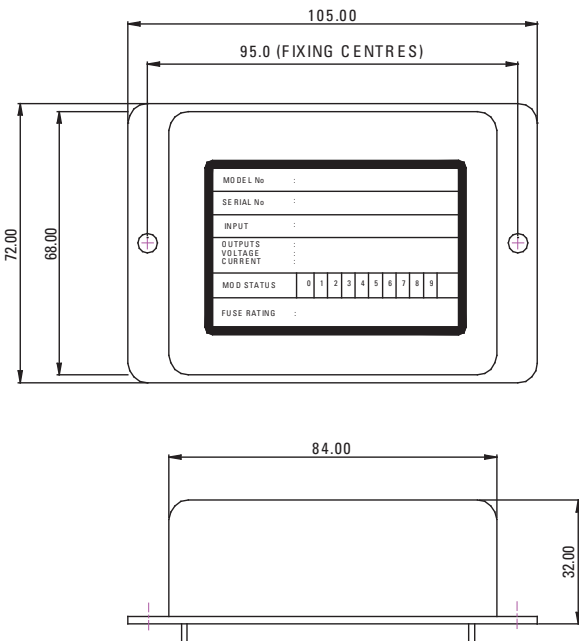
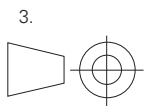
Mechanical Characteristics

Product reference	All references
Construction	Encapsulated Module
Dimensions	Depth = 84mm (105mm including flange) Width = 72mm Height = 32mm
Weight	300g
Connections	Solder pins for PCB mounting as standard. Specify Q7 for connections via flying leads (halogen free cable)
Fixings	Two Ø5mm fixing holes on flanges

Technical Drawing

NOTES

- All dimensions in mm
- Specifications subject to change without notification



Case: Moulded in flame retardant ABS to UL94 V-0.

Input (PL1)

1: +Ve 2: -Ve 3: Earth

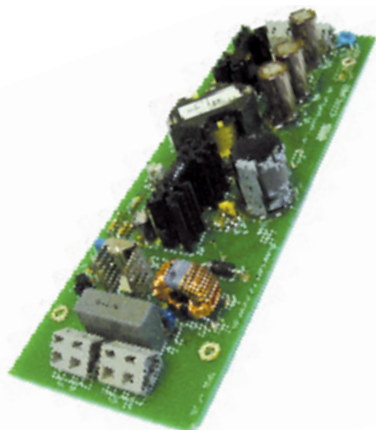
Output (PL2)

- +Ve (U1)
- 0V (U1)
- +Ve (U2)
- 0V (U2)
- +Ve (U3)
- 0V (U3)
- Must be connected to Earth



35W & 50 W JL SERIES

DC/DC CONVERTER



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 or 50W of continuous power at ambient temperatures of up to 75°C, the low component count makes the JL series a highly reliable yet low cost solution. For applications where the converter will be housed within an enclosure, the open frame version offers a further cost saving.

Features include:

- One or two outputs
- Wide operating temperature range
- Low component count, high reliability
- Simple construction - open frame or enclosed versions available
- Compliant with EN railway norms
- Low cost

Input Specifications

Product reference	All references
Nominal Input	Can be specified between 24V and 110 V dc
Input Range	60% -125% of nominal
Input Ripple	EN50155
Inrush Current	5 x nominal current (after 0.1ms)
Input Protection	Reverse polarity protection. Surges and transients to EN50155 (Direct and Indirect)
Efficiency	85% typical

Output Specifications

Product reference	All references
Maximum Output Power	JL series = 35W JLH series = 50W
Output Voltage	Single or dual output versions available. Fixed output can be specified in the range 5V to 110Vdc
Setting Tolerance	±2%
Line / Load Regulation	Single output version ±2%, second output where fitted ±10%
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% p-p of output voltage
Output Noise	<75mV p-p superimposed (up to 20MHz)
Response Time	1.0ms to within 2% (for a 20% - 90% load change)
Primary Power Limit	Operates at approximately 120% of rated output power
Isolation	Input to Outputs 2.5kV dc Output / Input to Case 1.5kVdc (enclosed version) Output to Output N/A (common ground)

Environmental Details

Product reference	All references
Operating Temperature	-25°C to +75°C
Storage Temperature	-40°C to +80°C
Humidity	95% maximum
Shock and Vibration	EN50155 para 10.2.11, EN60068-2-27



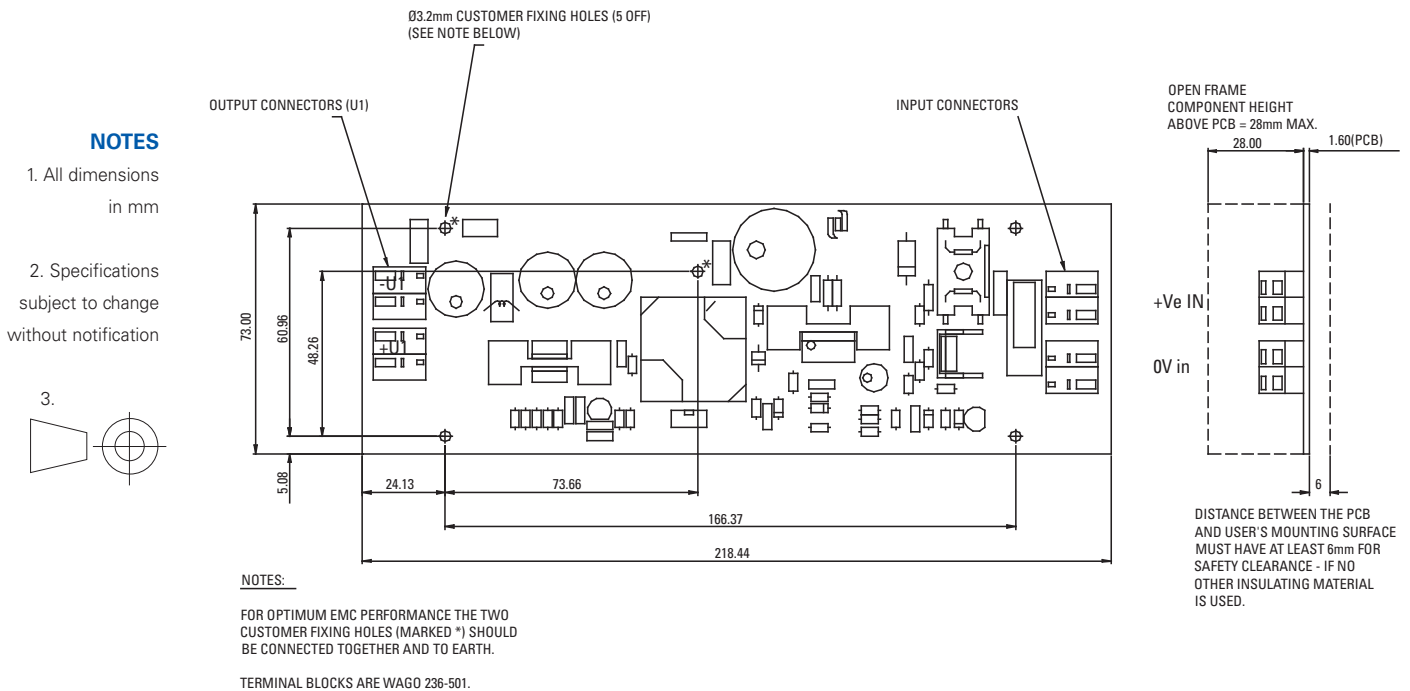
Applicable Norms

Item	Reference
EMC	EN50155, EN50121-3-2
Other	EN50155

Mechanical Characteristics

Product reference	All references
Construction	Open frame PCB or enclosed versions available
Finish	Conformal coated PCB; plated mild steel for enclosure
Mounting	Open frame version: Five Ø 3.2mm fixing holes on PCB Enclosed version : Four Ø 4.2mm fixing holes on base plate
Dimensions (PCB / enclosure)	Length = 220 / 250 mm Width = 73 / 78 mm Height = 30 / 35 mm
Weight	<0.5kg
Connections	Wago type 236-501
Cooling	By convection

Technical Drawing





50W SQ SERIES

DC/DC CONVERTER



Description

The 50W SQ Series converter has a very low profile open frame construction, and is intended for installation within the host equipment. The topology employed offers very high efficiency with outputs as low as 3.3V and is therefore ideal for driving LEDs in applications such as low voltage lighting and Passenger Information Systems.

Compliance with the traditional UK RIA standards, as well as current national and international railway norms, makes the SQ series equally suited to both new build and refurbishment applications.

Input Specifications

Product reference	All references
Input Voltage	110Vdc (other ranges available on request)
Input Range	66V – 137Vdc
Input Ripple	To RIA 13 and EN50155
Input Protection	Reverse polarity protection (series diode) surges and transients to BRB RIA 12, EN50155
Supply Interruptions	EN50155 class S2 (10ms hold-up from nominal input voltage)
Efficiency	85% typical
Input Fuse	Board mounted.

Output Specifications

Product reference	All references
Output Power	50W
Output Voltage	Fixed output can be specified between 3.3V and 24V
Output current	According to rated power and output voltage
Minimum Load	Zero
Setting Accuracy	±0.6% at 50% load, 15°C to 25°C
Line Regulation	±0.2%
Load Regulation	±0.5%
Temperature Coeff.	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<1% Pk-Pk super-imposed (up to 20 MHz)
Response Time	0.5ms to within 2% (for a 20% - 90% load change)
Indicators	N/A
Protection	Output protected against indirect transients to RIA 12 and EN50155
Current Limit	Operates at a minimum of 105% of nominal or peak load. Auto recovery.
Over-voltage	Output limited to 105 – 120% of nominal.
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.
Isolation	Input to Output 3.0 kV dc. Input to Case 1.5 kV dc. Output to Case 1.5 kV dc.

Environmental Details

Product reference	All references
Operating Temperature	-25°C to +71°C at full load -25°C to +85°C at 80% load
Storage Temperature	-40°C to +85°C
Cooling	Convection / conduction through base plate
Relative Humidity	95% max.
Environmental Protection	Conformal coating on PCB
Shock and Vibration	EN50155 para. 10.2.11, BRB RIA 20, LUL G6621





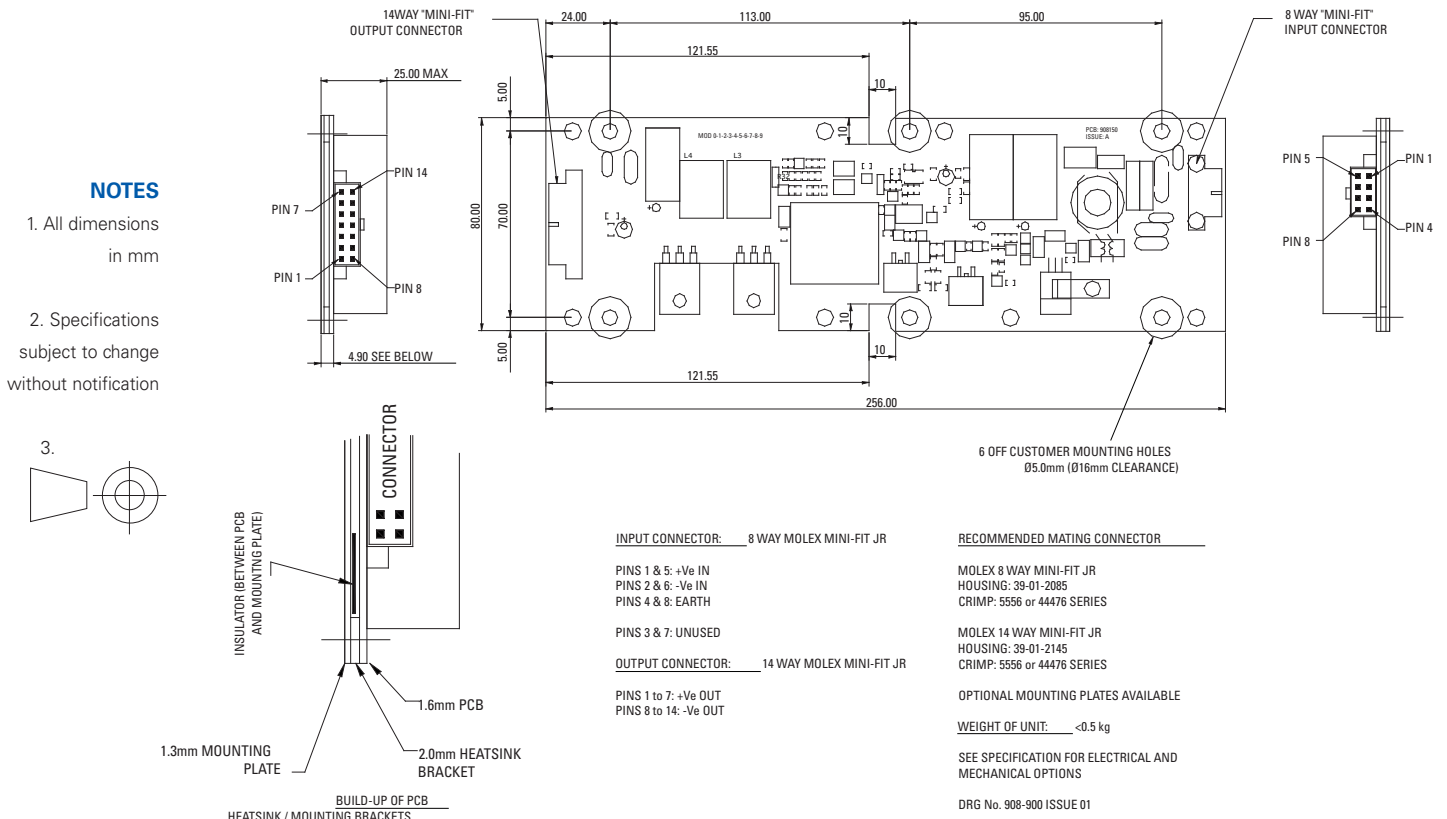
Applicable Norms

Item	Reference
EMC	BRB RIA 12, 18; EN50155, EN50121-3-2
Other	BRB RIA 13, 20; EN50155, LUL G6621-A2 amendments to EN50155

Mechanical Characteristics

Product reference	All references
Construction	Open frame PCB with mounting plate for cold wall mounting
Dimensions	Depth = 256 mm Width = 80 mm Height = 25 mm
Weight	0.5kg
Mounting	six Ø 5mm holes
Connections	Input via 8 way Mini-fit connector or 3 way Output via 14 way Mini-fit connector

Technical Drawing





55W DR SERIES

DC/DC CONVERTER



Description

The DR series is a well-established product range designed specifically for use on railway rolling stock. Units are available in single, dual and triple output versions with input ranges to cover all of those typically found in rail applications. Housed in a rugged 3U Eurocassette, the DR series is suitable for both rack and bulkhead mounting. The range is fully compliant with the current national and international railway standards and norms.

Input Specifications

The following input voltage versions are available as standard:

110V (66.0 -137V)	dc	(suffix A)	52V (31.2 -65V)	dc	(suffix C)
83V (48.0 -96V)	dc	(suffix G)	36V (21.0 - 50.4V)	dc	(suffix F)
72V (43.2 -90V)	dc	(suffix D)	24V (16.8 - 33.6V)	dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Ripple	To RIA 13 and EN50155
Input Protection	Reverse polarity protection; surges and transients to BRB/RIA 12, EN50155
Inrush Current	Limited to typically 5 x nominal current (after 0.1ms)
Efficiency	75% to 85% dependent on input / output voltage
Input Fuse	20mm cartridge style mounted on rear panel (option for internal or none)

Output Specifications

Part Number	Output 1		Output 2		Output 3	
	$U_{o\ nom}$ [V dc]	$I_{o\ nom}$ [A]	$U_{o\ nom}$ [V dc]	$I_{o\ nom}$ [A]	$U_{o\ nom}$ [V dc]	$I_{o\ nom}$ [A]
DR 0500	5	8.0				
DR 1200	12	4.5				
DR 2400	24	2.2				
DR 3000	30	1.8				
DR 0512	5	5.0	12	2.0		
DR 1212	12	2.2	12	2.2		
DR 1515	15	1.8	15	1.8		
DR 2424	24	1.1	24	1.1		
DR 3030	30	0.9	30	0.9		
DR 051212	5	5.0	2	1.0	12	1.0
DR 051515	5	5.0	15	0.8	15	0.75
DR 051224	5	4.0	12	0.8	24	0.4
DR 241515	24	1.0	15	0.8	15	0.75

Product reference	All references
Output Power	55W (45W for triple output)
Minimum Load	Zero for all outputs
Setting Accuracy	±0.5% at 50% load, 15°C to 25°C
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Temperature Coeff.	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<1% Pk-Pk super-imposed (up to 20 MHz)
Response Time	0.5ms to within 2% (for a 20% - 90% load change)
Indicators	Green "Output good" LED for each output
Protection	Output and signal lines protected against indirect transients to BRB/RIA 12, EN50155
Current Limit	Operates at a minimum of 110% of nominal load. Auto recovery.
Primary Protection	Operates at approximately 60W
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.
Isolation	Input to Output 3.0 kV dc. Input to Case 1.5 kV dc. Output to Case 1.5 kV dc. Output to Output 0.5 kV dc.

Option	Operation	Code
Input Fuse	Fitted internally on PCB	B
	Not Fitted	Z
Current Sharing	Red LED indication (only available on single output units)	F
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 voltage of U1 to safe level under fault conditions	P
Inhibit	TTL high to inhibit	V
Enable	Link to U1 return to enable	W



Environmental Details

Product reference	All references
Operating Temperature (no derating)	-25°C to +71°C
Storage Temperature	-40°C to +71°C (option T)
Cooling	Convection
Relative Humidity	95% maximum
Sealing	IP54
Shock and Vibration	BRB/RIA 13 - Para 10.5.11, BRB/RIA 20, EN50155 para 10.2.11

Option	Details	Code
Operating Temperature	Extended to -40°C	T

Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155, IEC571

Option	Details	Code
Connections	Gold plated pins to Class 1	G
	Flying leads	Q6
Enclosure	Alochrom front panel	Q4
	Additional mounting plate	M
	Connector retaining clips	H

Mechanical Characteristics

Product reference	All references
Construction	Eurocassette (front panel optional)
Dimensions	Depth = 168.5mm Width = 8TE Height = 3U
Weight	0.7kg
Mounting	Six M3 tapped holes in base (additional mounting plate with clear holes optional)
Connections	DIN 41612 H11 Class 1 (silver or gold). Clips for retaining mating connector are available as an option. Alternatively, specify option Q6 for connections via flying leads (halogen free cable).

NOTES

Output voltages:
See table overleaf for standard voltages available

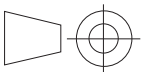
Output currents:
The values specified overleaf are the standard current option '1'

Alternative voltages & currents are available on request.

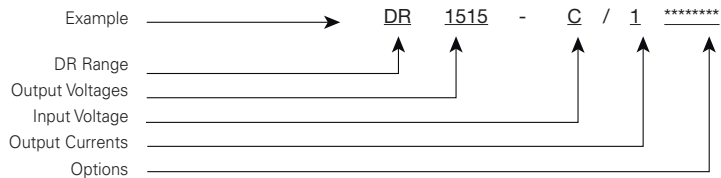
1. All dimensions in mm

2. Specifications subject to change without notification

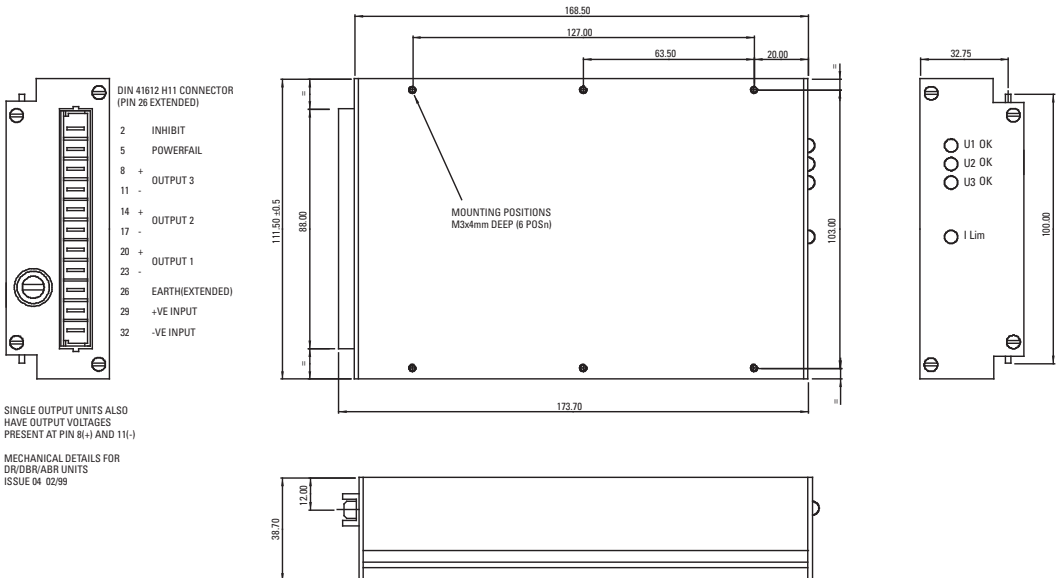
3.



Ordering Information



Technical Drawing





60W JLSP SERIES

DC/DC CONVERTER



Description

The JLSP series is designed specifically for use on railway rolling stock. These units are available in single or dual output versions with input ranges to cover all of those typically found in rail applications.

The JLSP range is fully compliant with the current national and international railway standards and norms.

Input Specifications

The following input voltage versions are available as standard:

110V	(66.0 - 137V) dc	(suffix A)
72V	(43.2 - 90.0V) dc	(suffix D)
52V	(31.2 - 65.0V) dc	(suffix C)
36V	(21 - 50.4V) dc	(suffix F)
24V	(16,8 - 33.6V) dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Ripple	To RIA 13 and EN50155
Input Protection	Reverse polarity protection via a series diode; surges and transients to BRB/RIA 12, EN50155
Inrush Current	Limited to typically 5 x nominal current (after 0.1ms)
Efficiency	75% to 90% dependent on input / output voltage
Input Fuse	Factory replacement only

Output Specifications

Product reference	All references						
Output Power	60W						
Output Voltage	Fixed output can be specified between 5V and 30Vdc						
Minimum Load	Zero for all outputs						
Setting Accuracy	±0.5% at 50% load, 15°C to 25°C						
Line Regulation	±0.2% all outputs						
Load Regulation	±0.5% all outputs						
Temperature Coeff.	<0.02% / °C						
Output Ripple	<1% Pk-Pk of output voltage						
Output Noise	<1% Pk-Pk super-imposed (up to 20 MHz)						
Response Time	0.5ms to within 2% (for a 20% - 90% load change)						
Inhibit	PL1 Pin 1 & 5, short to inhibit						
Protection	Output and signal lines protected against indirect transients to BRB/RIA 12, EN50155						
Current Limit	Operates at a minimum of 110% of nominal load. Auto recovery.						
Primary Protection	Operates at approximately 65W						
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.						
Isolation	<table border="0"> <tr> <td>Input to Output</td> <td>3.0 kV dc.</td> </tr> <tr> <td>Input to Case</td> <td>1.5 kV dc.</td> </tr> <tr> <td>Output to base plate</td> <td>1.5 kV dc.</td> </tr> </table>	Input to Output	3.0 kV dc.	Input to Case	1.5 kV dc.	Output to base plate	1.5 kV dc.
Input to Output	3.0 kV dc.						
Input to Case	1.5 kV dc.						
Output to base plate	1.5 kV dc.						

Environmental Details

Product reference	All references
Operating Temperature	-25°C to +71°C
Storage Temperature	-40°C to +71°C (option T)
Cooling	Convection
Relative Humidity	95% max
Shock and Vibration	BRB/RIA 13 - Para 10.5.11, BRB/RIA 20, EN50155 para 10.2.11



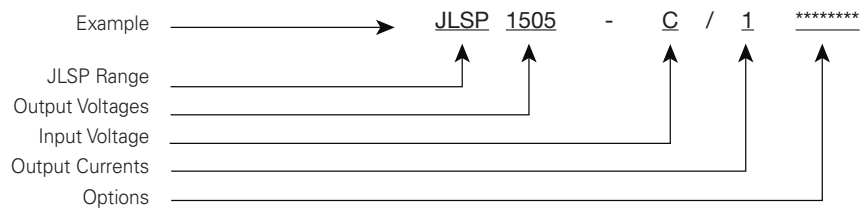
Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

Mechanical Characteristics

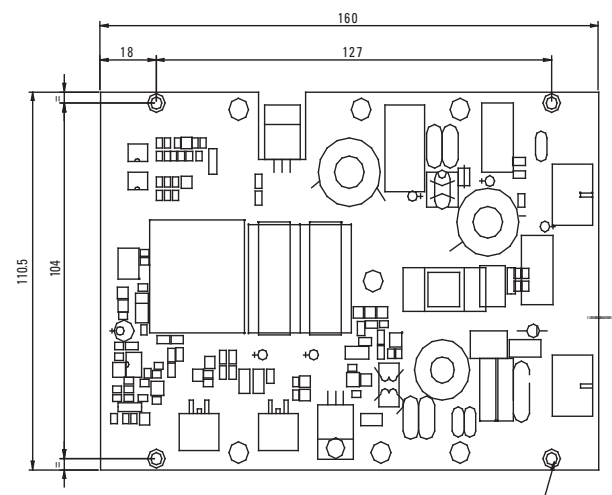
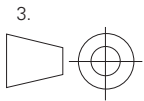
Product reference	All references
Construction	Open frame
Dimensions	Depth = 160 mm Width = 110.5 mm Height = 20 mm
Weight	<0.5kg
Mounting	Four Mounting holes
Connections	2 X 8 way Molex Mini-Fit Jnr.

Ordering Information

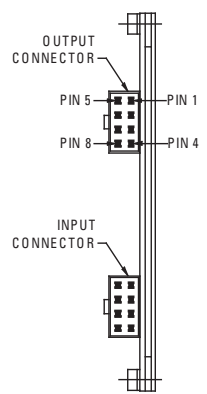
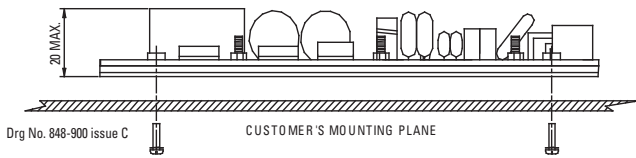


Technical Drawing

- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification



4 OFF CUSTOMER MOUNTING HOLES (#4-40 THREADED PCB INSERTS)



OUTPUT CONNECTOR: 8 WAY MOLEX MINI-FIT JR
 PINS 1 & 5: U1
 PINS 2,3,6 & 7: 0V (COMMON)
 PINS 4 & 8: U2

INPUT CONNECTOR: 8 WAY MOLEX MINI-FIT JR
 PINS 1 & 5: INHIBIT
 PIN 3: EARTH (CHASSIS)
 PIN 6: +Ve IN
 PIN 8: -Ve IN
 PINS 2,4 & 7 UNUSED

WEIGHT OF UNIT: <0.5Kg



100W SRE SERIES

DC/DC CONVERTER



Description

The SRE Series is an enclosed product designed specifically for use on railway rolling stock. The SRE is rated at 100W with a peak capability of up to 120W. Units are available in single or dual output versions with input ranges to cover all of those typically found in rail applications. The unit is suitable for either rack or bulkhead mounting. The range is fully compliant with the current 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)

Other ranges are available to order

Product reference	All references
Input Ripple	EN50155
Input Protection	Reverse polarity protection; surges and transients to EN50155
Efficiency	typically 90%
Input Fuse	Board mounted.

Output Specifications

Product reference	All references
Output Power	100W nominal (120W pk option)
Output Voltage	Fixed output can be specified in the range 5V to 48Vdc as standard
Minimum Load	Zero for all outputs
Setting Accuracy	±0.6% at 50% load, 15°C to 25°C
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Temperature Coeff.	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<1% Pk-Pk super-imposed (up to 20 MHz)
Response Time	0.5ms to within 2% (for a 20% - 90% load change)
Holdup Time	No hold up time offered
Indicators	Output OK LED
Signal	Output good signal given by an isolated open collector, optional
Protection	Output lines protected against indirect transients to EN50155
Current Limit	Operates at a minimum of 105% of nominal or peak load. Auto recovery
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery
Isolation	Input to Output 3.0kV dc Input to Case 1.5kV dc Output to Case 1.5kV dc Output to output 0.5 kV dc.

Environmental Details

Product reference	All references
Operating Temperature (no derating)	-25°C to +71°C (90°C max case temp) -40°C to +71°C (option T)
Storage Temperature	-40°C to +80°C
Cooling	Convection/ Conduction
Relative Humidity	95% max.
Environmental Protection	IP54
Shock and Vibration	EN50155 para 10.2.11





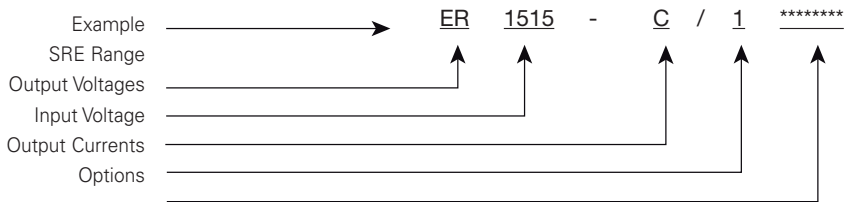
Applicable Norms

Item	Reference
EMC	EN50155, EN50121-3-2
Other	EN50155

Mechanical Characteristics

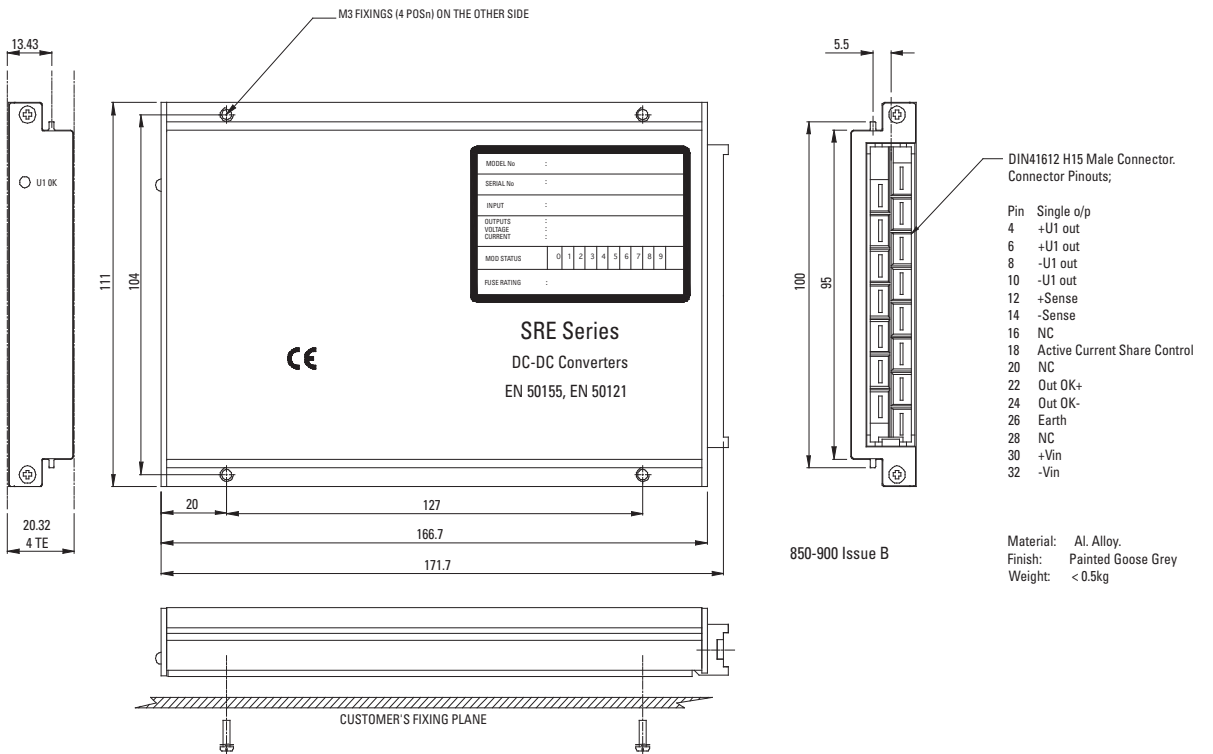
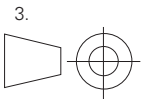
Product reference	All references
Construction	Open frame – Eurocard or Cold Wall mountable
Dimensions	Depth = 171.5 mm Width = 111.0 mm Height = 19.2 mm
Weight	370g
Mounting	Four M3 tapped holes in base strips (additional mounting plate with clear holes optional)
Connections	DIN 41612 H15 Class 1 (silver or gold). Alternatively, specify option Q6 for connections via flying leads (halogen free cable).

Ordering Information



Technical Drawing

- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification





120W SR SERIES

DC/DC CONVERTER



Description

The SR power is rated at 120W with peak capability of up to 150W. Units are available in single or dual output versions with input ranges to cover all of those typically found in rail applications. This unit is offered as an open frame converter that is suitable for either rack or bulkhead mounting. The range is fully compliant with the current national and international railway standards and norms.

Input Specifications

The following input voltage versions are available as standard:

110V	(66.0 - 137V)	dc	(suffix A)
83V	(48.0 - 96V)	dc	(suffix G)
72V	(43.2 - 90V)	dc	(suffix D)
52V	(31.2 - 65V)	dc	(suffix C)
36V	(21.0 - 50.4V)	dc	(suffix F)
24V	(16.8 - 33.6V)	dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Ripple	EN50155
Input Protection	Reverse polarity protection; surges and transients to EN50155
Efficiency	75% to 85% dependent on input / output voltage
Input Fuse	Board mounted.

Output Specifications

Product reference	All references
Output Power	120W nominal (150W pk option)
Output voltage	Can be specified from 5V to 30Vdc
Minimum Load	Zero for all outputs
Setting Accuracy	±0.6% at 50% load, 15°C to 25°C
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Temperature Coeff.:	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<1% Pk-Pk super-imposed (up to 20 MHz)
Response Time	0.5ms to within 2% (for a 20% - 90% load change)
Indicators	N/A
Protection	Output lines protected against indirect transients to EN50155
Current Limit	Operates at a minimum of 105% of nominal or peak load. Auto recovery.
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.
Isolation	Input to Output 3.0 kV dc. Input to Case 1.5 kV dc. Output to Case 1.5 kV dc. Output to Output 0.5 kV dc.

Environmental Details

Product reference	All references
Operating Temperature (no derating)	-25°C to +71°C -40°C to +71°C (option T)
Storage Temperature:	-40°C to +85°C
Cooling	Convection/ Conduction
Relative Humidity	95% max.
Sealing	N/A
Shock and Vibration	EN50155 para 10.2.11



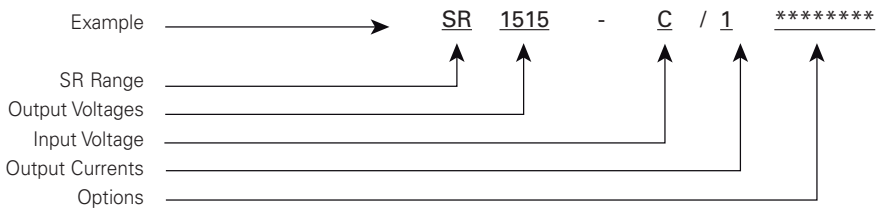
Applicable Norms

Item	Reference
EMC	EN50155, EN50121-3-2
Other	EN50155, IEC571

Mechanical Characteristics

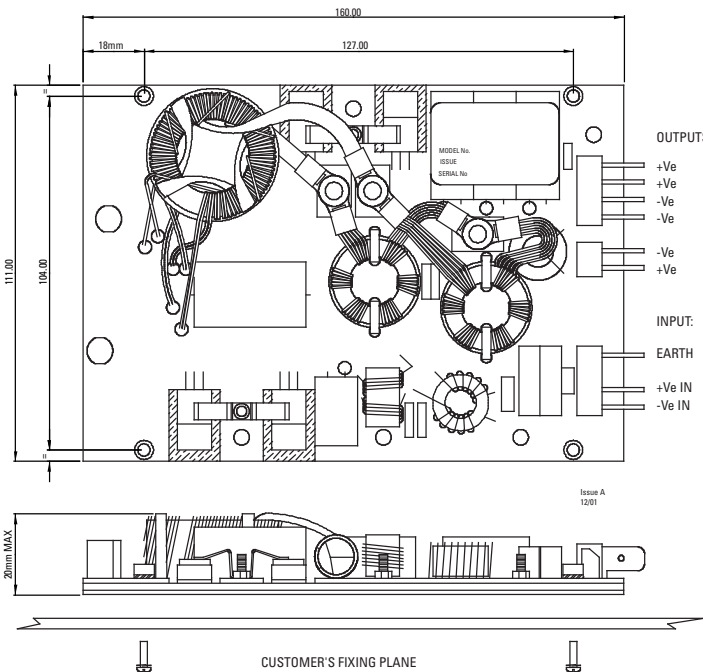
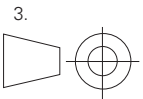
Product reference	All references
Construction	Open frame – Eurocard or Cold Wall mount options
Dimensions	Depth = 160 mm Width = 111 mm Height = 20 mm
Weight	0.5kg
Mounting	Four M3 tapped holes in base strips
Connections	90° Fast-ons (on H11 Pitch). Alternatively, specify option Q6 for connections via flying leads (halogen free cable).

Ordering Information



Technical Drawing

- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification





150W ER SERIES

DC/DC CONVERTER



Description

The 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 of 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 fully compliant with the current 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	(25.2 - 50.4V) dc	(suffix F)
24V	(16.8 - 33.6V) dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Ripple	To RIA 13 and EN50155
Input Protection	Reverse polarity protection; surges and transients to BRB/RIA 12, EN50155
Inrush Current	Limited to typically 6x nominal current (after 0.1ms)
Efficiency	80 to 90% dependent on input / output voltage
Input Fuse	20mm cartridge style mounted on rear panel (except -B input) (option for internal or none)

Output Specifications

Product reference	All references
Output Power	150W (limited to 125W for 24V input or 5V output unit)
Minimum Load	Zero for all outputs
Setting Accuracy	±0.5% at 50% load, 15°C to 25°C
Line Regulation	±0.2% all outputs
Load Regulation	±0.5% all outputs
Remote Sensing	Compensates for upto 250mV drop in each line (single output only)
Temperature Coeff.	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<1% Pk-Pk superimposed (up to 20 MHz)
Response Time	1.0ms to within 2% of nominal (for a 20% - 90% load change)
Indicators	Green LED for each output
Protection	Output and signal lines protected against indirect transients to BRB/RIA 12, EN50155
Current Limit	Operates at a minimum of 105% of nominal load. Automatic 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 (85°C to 100°C). Automatic recovery.
Isolation	Input to Output 3.0kV dc Input to Case 1.5kV dc Output to Case 1.5kV dc Output to output 250V dc

Part Number	Output 1		Output 2	
	$U_{o\ nom}$ [V dc]	$I_{o\ nom}$ [A]	$U_{o\ nom}$ [V dc]	$I_{o\ nom}$ [A]
ER 0500	5	25.0		
ER 1200	12	12.0		
ER 1500	15	10.0		
ER 2400	24	6.0		
ER 3000	30	5.0		
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

Option	Operation	Code
Input Fuse	Fitted internally on PCB	B
	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 voltage of U1 to safe level under fault conditions	P
Inhibit	TTL high to inhibit	V
Enable	Link to U1 return to enable	W



Environmental Details

Product reference	All references
Operating Temperature (no derating)	-25°C to +71°C -40°C to +71°C (option T)
Storage Temperature	-40°C to +85°C
Cooling	Convection
Relative Humidity	95% maximum
Sealing	IP54
Shock and Vibration	BRB/RIA 13 - Para 10.5.11, BRB/RIA 20, EN50155 para 10.2.11

Option	Details	Code
Operating Temperature	Extended to -40°C	T

Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155, IEC571

Mechanical Characteristics

Product reference	All references
Construction	Eurocassette (front panel optional)
Dimensions	Depth = 168.5mm Width = 16TE – heatsink = 9TE – cold wall mount Height = 3U
Weight	1.3kg (0.9kg cold wall mount)
Mounting	Four slotted M6 holes in heatsink. Option 'M' – six M4 threaded inserts; option 'M2' – six M5 holes
Connections	DIN 41612 H15 Class 1 (silver or gold). Clips for retaining mating connector are available as an option. Alternatively, specify option Q6 for connections via flying leads (halogen free cable).

Option	Details	Code
Connections	Gold plated pins to Class 1 Flying leads	G Q6
Enclosure	Alochrom front panel	Q4
	Cold wall mounting plate instead of heatsink	M1
	Cold wall mounting plate with clear holes	M2
	Connector retaining clips	H

NOTES

Output voltages:
See table overleaf for standard voltages available

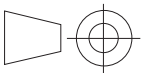
Output currents:
The values specified overleaf are the standard current option '1'

Alternative voltages & currents are available on request.

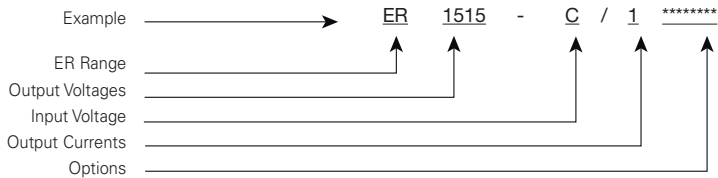
1. All dimensions in mm

2. Specifications subject to change without notification

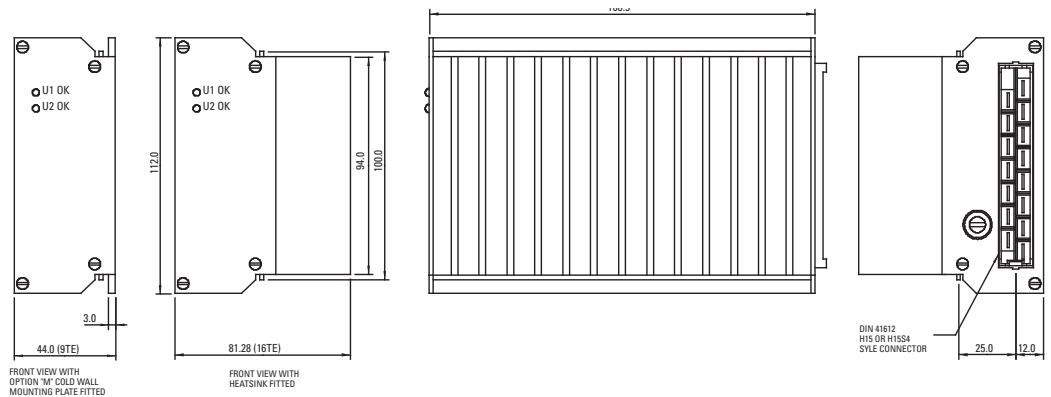
3.



Ordering Information



Technical Drawing



PIN No.	SINGLE D/P	DUAL D/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 -



200W & 400W NS SERIES

DC/DC CONVERTER

Description

The NS series is a range of medium and high power single output converters that comply fully with both the traditional and latest rail specifications and norms for protection and EMC. The rugged construction and mounting arrangement ensures compliance with vibration and shock requirements

Special features include:

- Wide choice of input and output voltages
- High output current capability
- Fully compliant with rail standards, including EN50121.3.2



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)
24V	(16.8 - 33.6V)	dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Range	60% - 125% of nominal
Input Ripple	To BRB/RIA 13 and EN50155
Input Protection	Reverse polarity protection (some input versions require external fuse or circuit breaker) Surges and transients to BRB/RIA 12, EN50155 (Direct and Indirect)
Inrush Current	6 x nominal current (after 0.1ms)
Efficiency	85% typical

Output Specifications

Product reference	All references
Maximum Output Power	NSL series = 200W NSH series = 400W (except 24V input version, which is 300W without derating)
Output Voltage	Fixed output can be specified in the range 5V to 110V
Setting Tolerance	+1.0% at 50% load, 15°C to 25°C
Output Current	According to rated power and output voltage
Line Regulation	±0.5%
Load Regulation	±0.5%
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<75mV superimposed (up to 20 MHz)
Response Time	0.5ms to within 1% (for a 10% - 100% load change)
Holdup Time	10ms at nominal input and maximum load
Primary Power Limit	Operates at approximately 110% of rated output power
Thermal Protection	Output shuts off when safe operating temperature is exceeded
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

Product reference	All references
Operating Temperature	-25°C to +55°C
Storage Temperature	-40°C to +80°C
Relative Humidity	95% maximum
Vibration	BRB/RIA 13 - Para 10.5.11, BRB/RIA 20

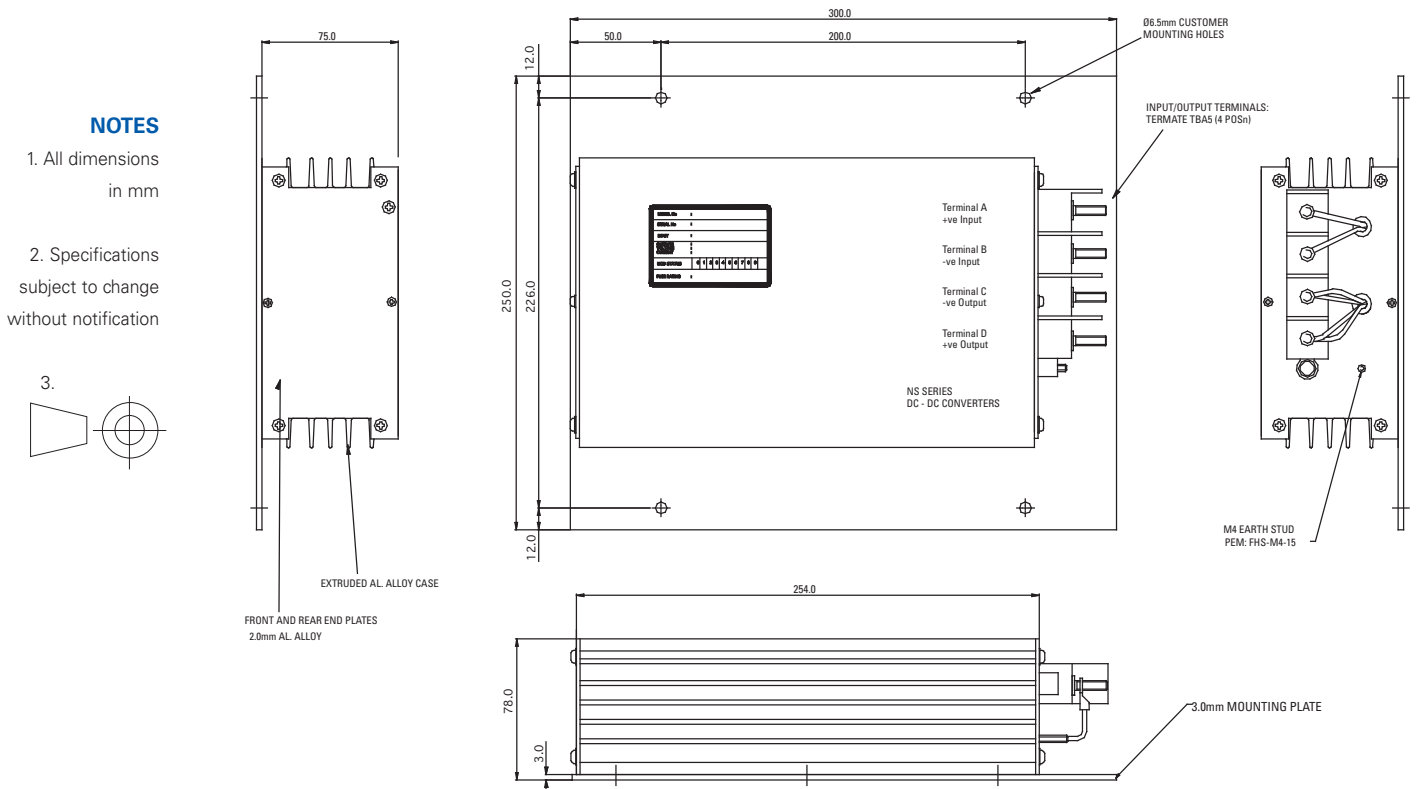
Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

Mechanical Characteristics

Product reference	All references
Construction	Fully enclosed in rugged splash-proof case
Mounting	Flush mounting with four Ø6.5mm fixing holes on base plate (base plate optional).
Fixing Centers	226 x 200mm
Dimensions	Depth = 260mm (300mm with connectors) Width = 160mm (250mm with plate) Height = 75mm (78mm with plate)
Weight	<4.0kg
Connections	Connections are made by external M5 studs (input & output) and an M4 earth stud
Cooling	By convection

Technical Drawing





250W ACR SERIES

DC/AC INVERTER

Description

The ACR series is a range of medium power inverters that provide a 240Vac true sinewave output with very low distortion. Designed for connection directly to the train auxiliary supply, the inverters incorporate surge and transient filtering ensuring compliance with both the traditional and latest rail specifications and norms for protection and EMC. The rugged construction and various mounting options ensure compliance with vibration and shock requirements.

Special features include:

- True sinewave output
- 250W continuous output power (400W peak)
- Very low distortion
- IP65 rated



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)
24V	(16.8 - 33.6V) dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Range	60% - 125% of nominal
Input Ripple	To BRB/RIA 13 and EN50155
Input Protection	Reverse polarity protection (some input versions require external fuse or circuit breaker) Surges and transients to BRB/RIA 12, EN50155 (Direct and Indirect)
Inrush Current	6 x nominal current (after 0.1ms)
Efficiency	85% typical

Output Specifications

Product reference	All references									
Maximum Output Power	250W continuous 400W peak (for 15 seconds.)									
Output Voltage	240V									
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C									
Output Frequency	50Hz									
Frequency Tolerance	±2%									
Waveform	True Sinewave									
Harmonic Distortion	<1.5%									
Output Current	1.1A continuous, 1.7A for 15 seconds									
Line & Load Regulation	±5.0% combined									
Temperature Coefficient	<0.02% / °C									
Output Ripple	typically 5% Pk-Pk of output voltage									
Holdup Time	10ms at nominal input and maximum load									
Short Circuit Protection	Latch operates instantaneously if output current exceeds 15A (typically). LED indication provided. Reset by power-down, power-up.									
Delayed Current Limit	Latch operates if output power exceeds approximately 275W for longer than 16 to 20 seconds. LED indication provided. Reset by power-down, power-up.									
Thermal Protection	Output shuts off when safe operating temperature is exceeded. Automatic reset.									
Isolation	<table border="0"> <tr> <td>Input to Output</td> <td>1.0kV ac</td> <td>(Tested at 1.5kV dc)</td> </tr> <tr> <td>Input to Case</td> <td>1.0kV ac</td> <td>(Tested at 1.5kV dc)</td> </tr> <tr> <td>Output to Case</td> <td>1.0kV ac</td> <td>(Tested at 1.5kV dc)</td> </tr> </table>	Input to Output	1.0kV ac	(Tested at 1.5kV dc)	Input to Case	1.0kV ac	(Tested at 1.5kV dc)	Output to Case	1.0kV ac	(Tested at 1.5kV dc)
Input to Output	1.0kV ac	(Tested at 1.5kV dc)								
Input to Case	1.0kV ac	(Tested at 1.5kV dc)								
Output to Case	1.0kV ac	(Tested at 1.5kV dc)								
Indicators	<table border="0"> <tr> <td>Input OK</td> <td>Green LED</td> </tr> <tr> <td>Output OK</td> <td>Green LED</td> </tr> <tr> <td>Lock out</td> <td>Red LED</td> </tr> <tr> <td>Over-current latch</td> <td>Red LED</td> </tr> </table>	Input OK	Green LED	Output OK	Green LED	Lock out	Red LED	Over-current latch	Red LED	
Input OK	Green LED									
Output OK	Green LED									
Lock out	Red LED									
Over-current latch	Red LED									





Environmental Details

Product reference	All references
Operating Temperature	-25°C to +55°C
Storage Temperature	-40°C to +80°C
Environmental protection	IP65
Relative Humidity	99% maximum
Vibration	BRB/RIA 13 – Para 10.5.11, BRB/RIA 20

Applicable Norms

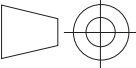
Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155, LUL G6621

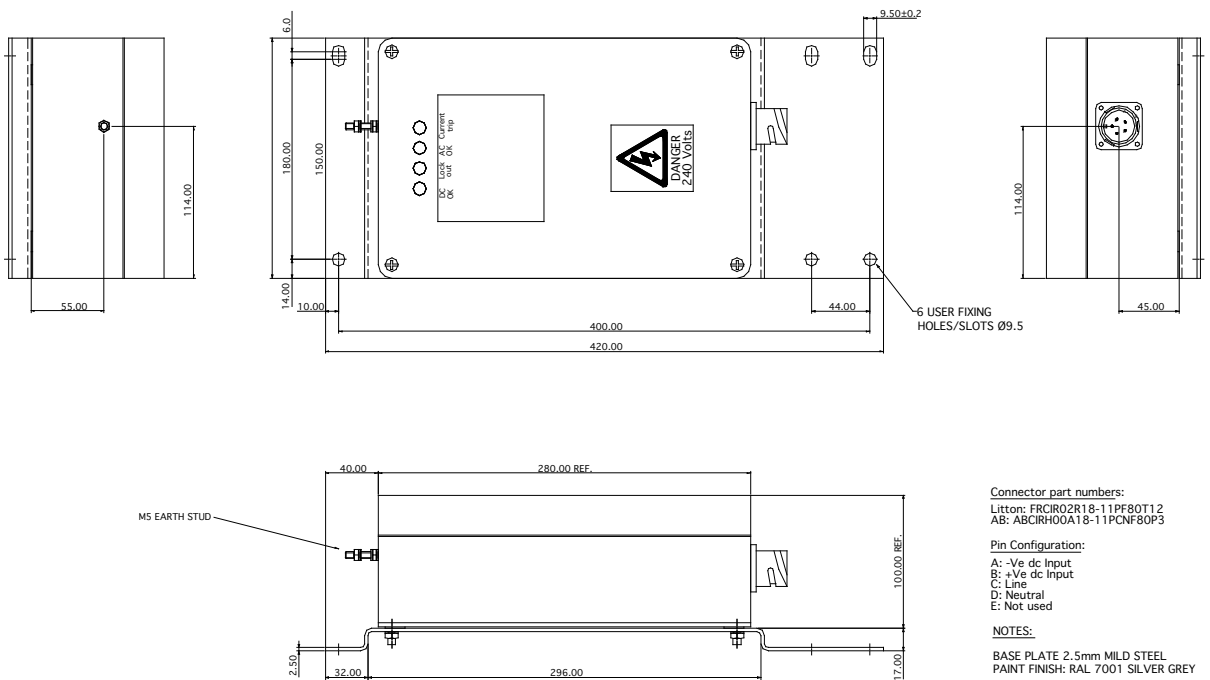
Mechanical Characteristics

Product reference	All references
Construction	Fully enclosed in sealed die-cast aluminium case
Mounting	Base plate allows surface mounting via six Ø9.5mm fixing holes, other base plates available upon request.
Dimensions (excluding base plate and connector)	Depth = 180mm Width = 280mm Height = 100mm
Weight	<6.5kg (5kg excluding mounting plate)
Connections	Input and output via circular bayonet connector (shell size 18-11), earth via M5 stud
Cooling	By convection

Technical Drawing

NOTES

- All dimensions in mm
- Specifications subject to change without notification
- 
- Base plate 2,5 mm mild steel
- Paint finish: RAL 7001 silver grey





300W ATG SERIES

DC/DC CONVERTER



Description

The ATG series is a range of cost effective, medium power single output converters that comply fully with the latest rail specifications and norms for protection and EMC. Although simple in construction the mounting arrangement ensures compliance with vibration and shock requirements of EN 50155.

Special features include:

- Wide choice of input and output voltages
- High output current capability
- High Efficiency
- Fully compliant with rail standards, including EN 50155 & EN50121.3.2
- BRB RIA version also available upon request

Input Specifications

The following input voltage versions are available as standard:

110V (66.0 - 137.5V) dc	(suffix A)	36V (25.0 - 45.0V) dc	(suffix F)
72V (43.2 - 90.0V) dc	(suffix D)	24V (16.8 - 33.6V) dc	(suffix B)
52V (31.2 - 65.0V) dc	(suffix C)	Other ranges are available to order	

Product reference	All references
Input Range	70% - 125% of nominal (60% 100ms)
Input Ripple	EN50155
Input Protection	Reverse polarity protection (some input versions require external fuse or circuit breaker) Surges and transients to EN50155 (Direct and Indirect) Protection to BRB RIA 12 upon request (option R)
Inrush Current	6 x nominal current (after 0.1ms)
Efficiency	90% typical

Output Specifications

Product reference	All references
Maximum Output Power	300W (dependant on output voltage)
Output Voltage	Fixed output can be specified in the range 12V to 110V
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C
Output Current	According to rated power and output voltage
Line Regulation	±0.5%
Load Regulation	±0.5%
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<75mV superimposed (up to 20 MHz)
Response Time	0.5ms to within 1% (for a 10% - 100% load change)
Holdup Time	10ms (EN50155 Class S2) for 110Vdc input only
Primary Power Limit	Operates at approximately 110% of rated output power
Thermal Protection	Output shuts off when safe operating temperature is exceeded
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

Product reference	All references
Operating Temperature	-25°C to +70°C (base plate is suitable for 'cold wall' mounting and must not exceed 85°C for full power operation)
Storage Temperature	-40°C to +80°C
Relative Humidity	95% maximum
Vibration	EN50155



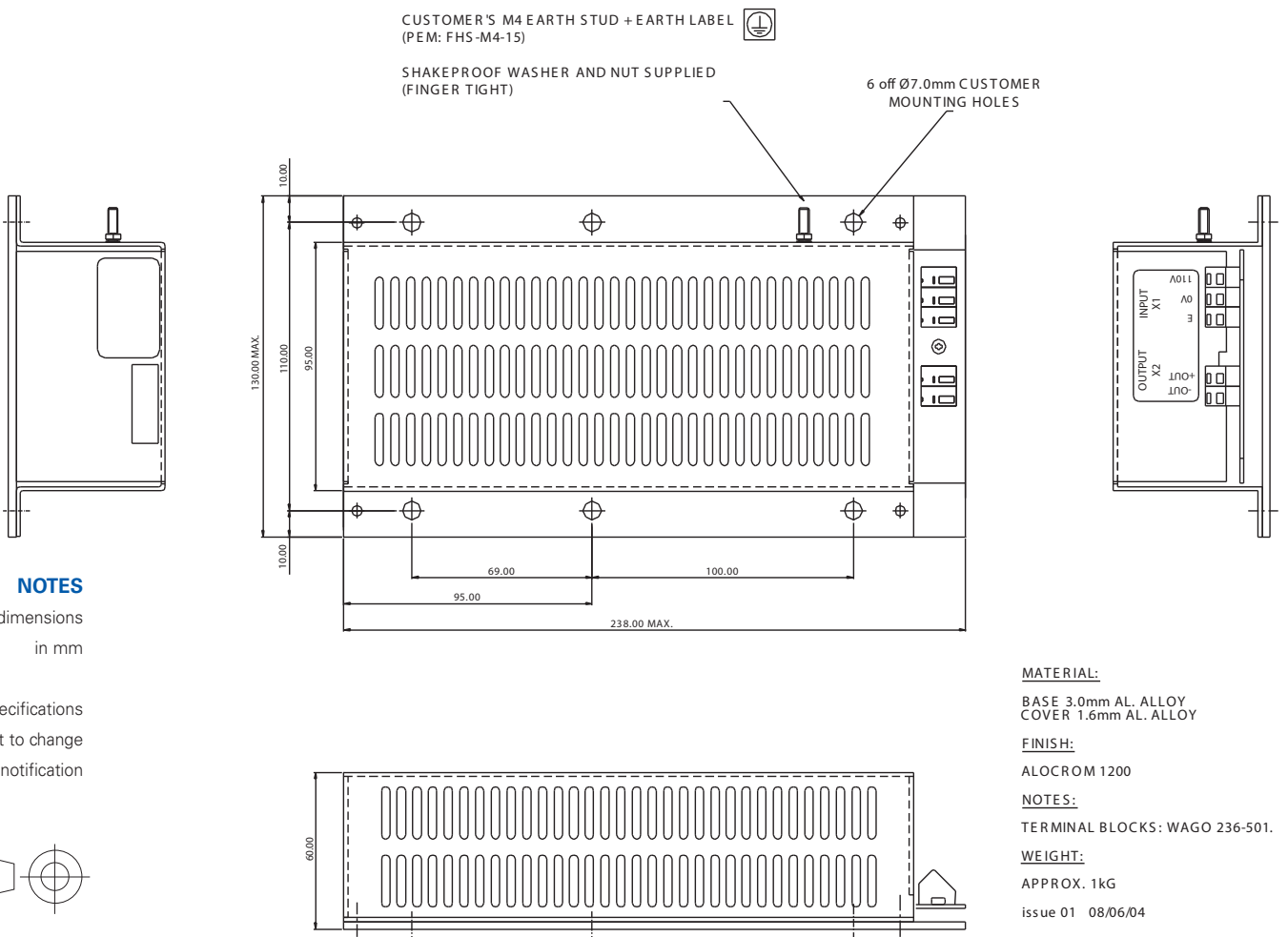
Applicable Norms

Item	Reference
EMC	EN50155, EN50121-3-2
Other	EN50155 (BRB RIA specs also available upon request – option R)

Mechanical Characteristics

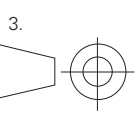
Product reference	All references
Construction	Simple aluminum chassis
Mounting	Flush mounting with six Ø7mm fixing holes on base plate
Dimensions	Depth = 238mm Width = 130mm Height = 60mm
Weight	<1.0kg
Connections	Wago 236-501 terminal blocks and an M4 earth stud
Cooling	By convection

Technical Drawing



NOTES

1. All dimensions in mm
2. Specifications subject to change without notification



MATERIAL:
BASE 3.0mm AL. ALLOY
COVER 1.6mm AL. ALLOY

FINISH:
ALOCROM 1200

NOTES:
TERMINAL BLOCKS: WAGO 236-501.

WEIGHT:
APPROX. 1kg
issue 01 08/06/04



750W ACR SERIES

DC/AC INVERTER



Description

The ACR series is a range of medium power inverters that provide a 230Vac true sinewave output with very low distortion. Designed for connection directly to the train auxiliary supply, the inverters incorporate surge and transient filtering ensuring compliance with both the traditional and latest rail specifications and norms for protection and EMC. The rugged construction and various mounting options ensure compliance with vibration and shock requirements.

Special features include:

- True sinewave output
- 750W continuous output power (800W peak)
- Very low distortion
- IP65 rated

Input Specifications

The following input voltage versions are available as standard:

110V (66.0 - 137.5V) dc (suffix A)	24V (16.8 - 33.6V) dc (suffix B)
72V (43.2 - 90.0V) dc (suffix D)	(24V version de-rated to 600W output power)
52V (31.2 - 65.0V) dc (suffix C)	Other ranges are available to order

Product reference	All references
Input Range	60% - 125% of nominal
Input Ripple	To BRB/RIA 13 and EN50155
Input Protection	Reverse polarity protection via a shunt diode that will trip an external circuit breaker Surges and transients to BRB/RIA 12, EN50155 (Direct and Indirect)
Inrush Current	5 x nominal current (after 0.1ms)
Efficiency	85% typical

Output Specifications

Product reference	All references
Maximum Output Power	750W continuous 800W peak (for 15 seconds.)
Output Voltage	230V
Setting Tolerance	± 1% at 50% load, 15°C to 25°C
Output Frequency	50Hz
Frequency Tolerance	±2%
Waveform	True Sinewave
Harmonic Distortion	<6%
Output Current	Nominal 3.3Arms
Line & Load Regulation	± 4%
Temperature Coefficient	<0.02% / °C
Output Ripple	typically 5% Pk-Pk of output voltage
Holdup Time	10ms at nominal input and maximum load
Short Circuit Protection	Operates instantaneously if output current exceeds 10A (typically). Auto recovery.
Overload Protection	Inverter shuts down if output power exceeds approximately 800W for longer than 16 to 20 seconds. LED indication provided. Resets automatically after approximately 10 seconds
Thermal Protection	Output shuts off when safe operating temperature is exceeded. Automatic reset.
Isolation	Input to Output 1.5kV ac (Tested at 2.2kV dc) Input to Case 1.5kV ac (Tested at 2.2kV dc) Output to Case 1.5kV ac (Tested at 2.2kV dc) Relay contacts 1.5kV ac
Indicators & signaling	Input present Green LED Output present Green LED Overload trip Red LED Relay contacts NO / NC volt-free contacts changeover to indicate output is present. Contact rating – 1A.



Environmental Details

Product reference	All references
Operating Temperature	-25°C to +55°C
Storage Temperature	-40°C to +80°C
Environmental protection	IP65
Relative Humidity	99% maximum
Vibration	BRB/RIA 13 – Para 10.5.11, BRB/RIA 20

Applicable Norms

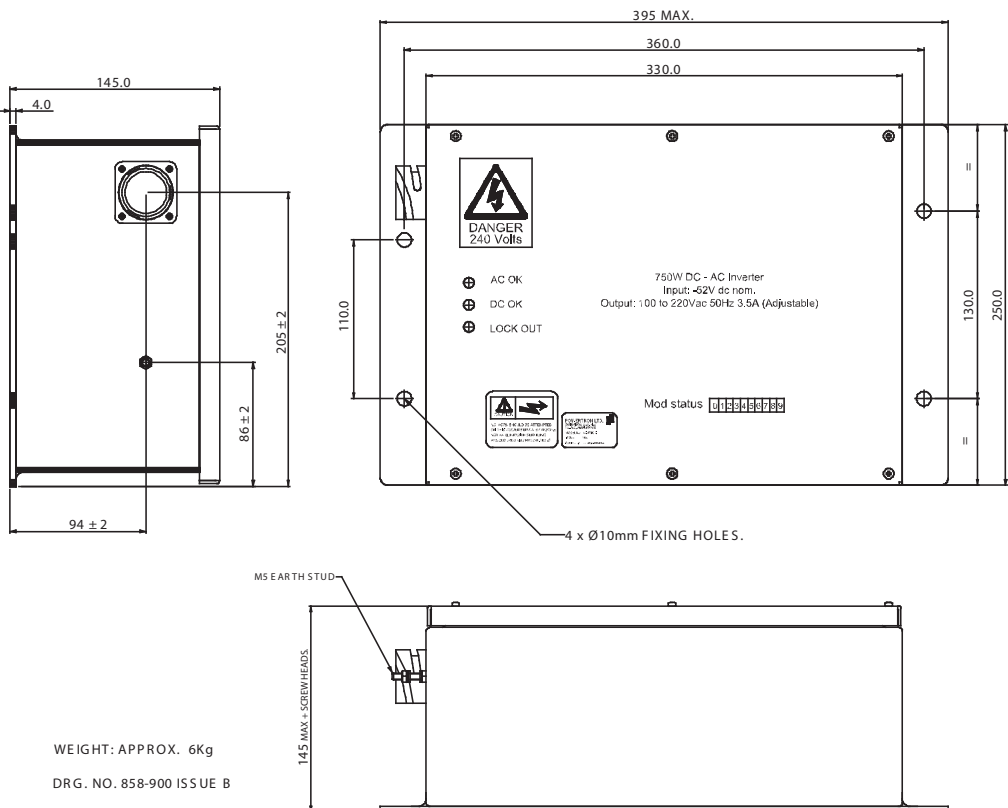
Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

Mechanical Characteristics

Product reference	All references
Construction	Fully enclosed in sealed aluminium case
Mounting	Base plate allows surface mounting via four Ø10.0mm fixing holes, other base plates available upon request.
Dimensions (excluding base plate and connector)	Length = 330 mm Width = 250 mm Height = 145 mm
Weight	<6kg
Connections	19 way circular connector (22-14 shell size)
Cooling	By convection
Outline drawing	Please refer to document 858-900

Technical Drawing

- NOTES**
- All dimensions in mm
 - Specifications subject to change without notification
 -



WEIGHT: APPROX. 6Kg
DRG. NO. 858-900 ISSUE B



750W ASP SERIES

DC/AC INVERTER



Description

The At Seat Power series is a range of medium power inverters that provide a 240Vac true sine wave output with very low distortion. Designed for connection directly to the train auxiliary supply, the inverters incorporate surge and transient filtering ensuring compliance with both the traditional and latest rail specifications and norms for protection and EMC. The rugged construction and various mounting options ensure compliance with vibration and shock requirements.

Special features include:

- True sine wave output
- Ideal for mobile phone and laptop charging
- 750W continuous output power (800W peak)
- Very low distortion
- Low profile for behind seat mounting
- IP65 rated main enclosure
- RCBO output protected

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)
24V	(16.8 - 33.6V) dc	(suffix B) <i>(24V version de-rated to 600W output power)</i>

Other ranges are available to order

Product reference	All references
Input Range	60% - 125% of nominal
Input Ripple	To BRB/RIA 13 and EN50155
Input Protection	Reverse polarity protection via a shunt diode that will trip an external circuit breaker. Surges and transients to BRB/RIA 12, EN50155 (Direct and Indirect)
Inrush Current	5 x nominal current (after 0.1ms)
Efficiency	85% typical

Output Specifications

Product reference	All references
Maximum Output Power	750W continuous 800W peak (for 15 seconds.)
Output Voltage	230V
Setting Tolerance	± 1% at 50% load, 15°C to 25°C
Output Frequency	50Hz
Frequency Tolerance	± 2%
Waveform	True Sine wave
Harmonic Distortion	<6%
Output Current	Nominal 3.3Arms
Line & Load Regulation	± 4%
Temperature Coefficient	<0.02% / °C
Output Ripple	typically 5% Pk-Pk of output voltage
Holdup Time	10ms at nominal input and maximum load
Overload Protection	Inverter shuts down if output power exceeds 800W for longer than 16 to 20 seconds. LED indication provided. Resets automatically after approximately 10 seconds.
Short Circuit Protection	Operates instantaneously if output current exceeds 10A (typically). Auto recovery.
Earth Leakage Protection	MCBO (combined RCD and circuit breaker) also allows physical isolation of output.
Thermal Protection	Output shuts off when safe operating temperature is exceeded. Automatic reset.
Isolation	Input to Output 1.5kV ac (Tested at 2.2kV dc) Input to Case 1.5kV ac (Tested at 2.2kV dc) Output to Case 1.5kV ac (Tested at 2.2kV dc) Relay contacts 1.5kV ac
Indicators & signaling	Input present Green LED Output present Green LED Overload trip Red LED



Environmental Details

Product reference	All references
Operating Temperature	-25°C to +55°C
Storage Temperature	-40°C to +80°C
Environmental protection	IP54
Relative Humidity	99% maximum
Vibration	BRB/RIA 13 – Para 10.5.11, BRB/RIA 20

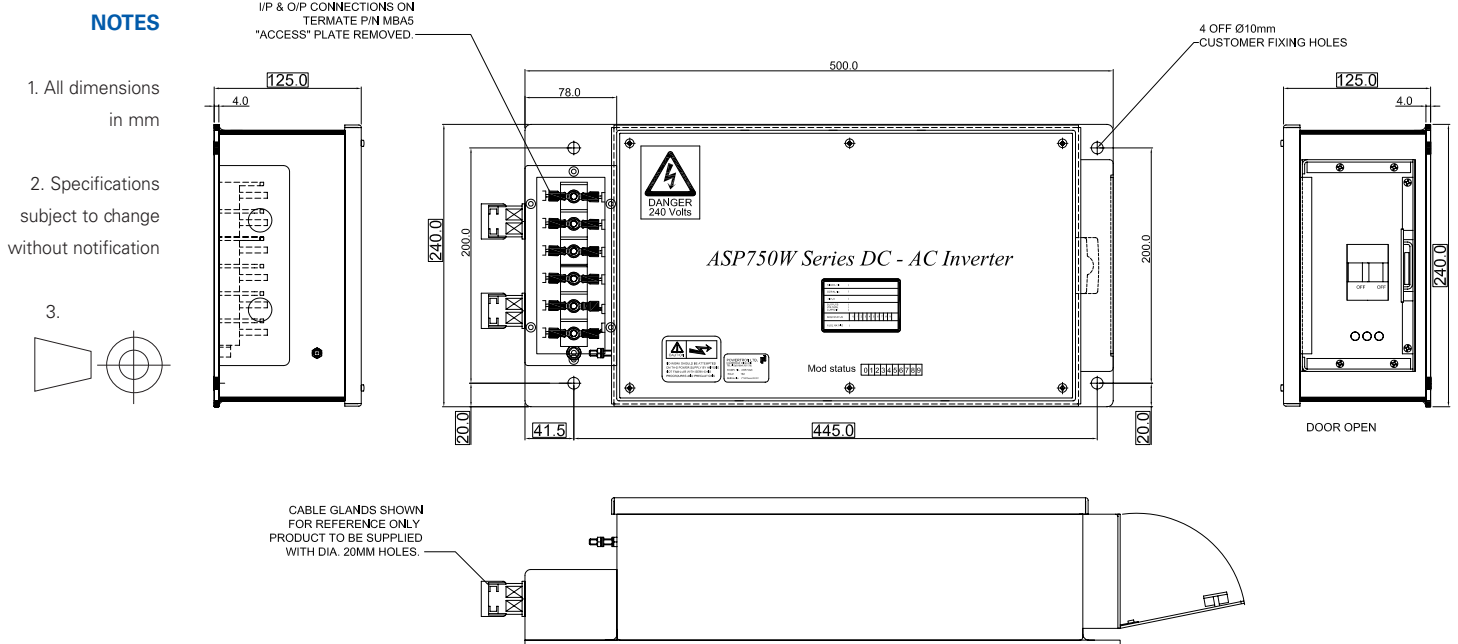
Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

Mechanical Characteristics

Product reference	All references
Construction	Fully enclosed in sealed aluminium case
Mounting	Base plate allows surface mounting via four Ø10.0mm fixing holes, other base plates available upon request.
Dimensions	Length = 490 mm (includes mounting plate) Width = 250 mm Height = 130 mm
Weight	<6kg
Connections	M5 studs within the main enclosure accessible via cable glands
Cooling	By convection
Outline drawing	See below

Technical Drawing





800W AT SERIES

DC/DC CONVERTER



Description

The AT series is a highly versatile product range. These high power output converters comply fully with both the traditional and latest rail specifications and norms for protection and EMC. The rugged construction and mounting arrangement ensures compliance with vibration and shock requirements.

Special features include:

- Wide choice of input and output voltages
- Various output configurations, single, dual and N+1 operation available
- High output current capability
- Fully compliant with rail standards, including EN50121.3.2

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)
24V	(16.8 - 33.6V) dc	(suffix B)

Other ranges are available to order

Product reference	All references
Input Range	60% - 125% of nominal
Input Ripple	To BRB/RIA 13 and EN50155
Input Protection	Reverse polarity protection (some input versions require external fuse or circuit breaker) Surges and transients to BRB/RIA 12, EN50155 (Direct and Indirect)
Inrush Current	6 x nominal current (after 0.1ms)
Efficiency	85% typical

Output Specifications

Product reference	All references
Maximum Output Power	Single & equal dual output = 800W N+1 operation = 400W
Output Voltage	Fixed output can be specified in the range 5V to 110V
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C
Output Current	According to rated power and output voltage
Line Regulation	±0.5%
Load Regulation	±0.5% (+1% for N+1 models)
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of output voltage
Output Noise	<75mV superimposed (up to 20 MHz)
Response Time	0.5ms to within 1% (for a 10% - 100% load change)
Holdup Time	10ms at nominal input and maximum load
Primary Power Limit	Operates at approximately 120% of rated output power
Thermal Protection	Output shuts off when safe operating temperature is exceeded
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

Product reference	All references
Operating Temperature	-25°C to +55°C
Storage Temperature	-40°C to +80°C
Relative Humidity	95% maximum
Vibration	BRB/RIA 13 - Para 10.5.11, BRB/RIA 20



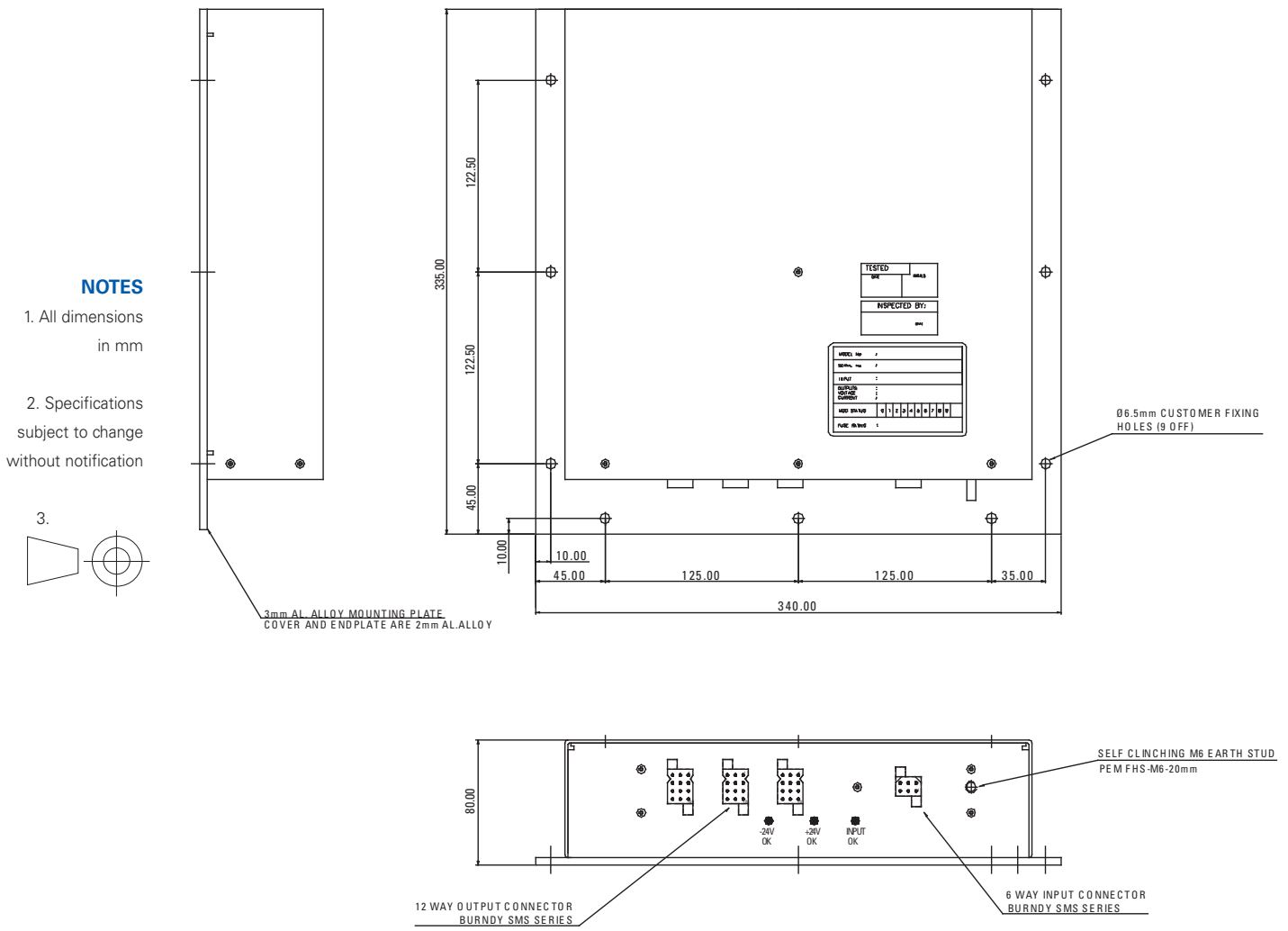
Applicable Norms

Item	Reference
EMC	BRB/RIA 12, 18; EN50155, EN50121-3-2
Other	BRB/RIA 13, 18, 20; EN50155

Mechanical Characteristics

Product reference	All references
Construction	Fully enclosed in rugged splash-proof case
Mounting	Flush mounting with nine Ø6.5mm fixing holes on base plate
Dimensions	Depth = 335mm Width = 340mm Height = 80mm
Weight	<5.0kg
Connections	Connections are made by Burndy SMS series connectors and an M6 earth boss
Cooling	By convection

Technical Drawing





| EUROPEAN SALES OFFICE

15, rue du Bicentenaire de la Révolution
Z.A. du Parc – Le Plessis-Pâté
91731 Brétigny-sur-Orge
FRANCE
tel. + 33 (0)1 69 88 83 97
fax. + 33 (0)1 69 88 80 37
sales@martekpower.fr

| HEAD OFFICE

Les Auberges
69770 Montrottier
FRANCE
tel. + 33 (0)4 74 70 27 00
fax. + 33 (0)4 74 70 14 41
sales@martekpower.fr

| USA SALES OFFICE

1111 Knox Street
Torrance, CA 90502-1034
USA
tel. + 1 (310) 202 8820
fax. + 1 (310) 836 1027
sales@martekpower.com