

# PM250

## DC-DC Converter



## PM250-series 187 to 250W

### Input / Output

- Optimized input voltage ranges.
- Input ranges from 11 to 300 Vd.c.
- Single outputs from 13.2 to 110 Vd.c.
- Reverse input voltage protection.

### Features

- Overvoltage protection, OVP.
- Over/Under voltage alarm with relay output
- Extra output with series diode.
- Output voltage adjustable from outside.

### Operation

- Operating temperature range -25 to +55°C
- Fully encapsulated, meets IP20 as standard.
- Convection cooled.

### EMC

- EN61000-6-2, Immunity
- EN61000-6-4, Emission.
- EN/IEC61000-4-4, 4kV.
- EN/IEC61000-4-5 level 2&3.

## Input and output ratings

Nominal inputs	Input range	Stop level	Code
12 Vd.c.	11 to 16V	<10Vd.c.	12
24 Vd.c.	20 to 32V	<16.8Vd.c.	24
48 Vd.c.	41 to 60V	<33.6Vd.c.	48
110, 127 Vd.c.	93 to 150V	<77Vd.c.	110
220, 250 Vd.c.	187 to 300V	<154Vd.c.	220

Input range, is the range we guarantee full output performance,  $U_{out} + 10\%$ ,  $I_{out} + 5\%$  @ +55°C. The converter works down to the stop level -35%. The output voltage might decrease to approx -10% of nominal output at the stop level.

Output		
Voltage	Current	Power
13.2V	14.1 - 18.9A	187 - 250W
24V	7.8 - 10.4A	187 - 250W
36V	5.2 - 6.9A	187 - 250W
48V	3.9 - 5.2A	187 - 250W
60V	3.1 - 4.2A	187 - 250W
110V	1.7 - 2.3A	178 - 250W

Other input and output combinations on demand.

## Output ratings and type code

Output			Input				
Voltage	Current	Power	11 - 16V	20 - 32V	41 - 60V	93 - 150V	187 - 300V
13.2V	14.1A	187W	PM250 12/13.2				
13.2V	18.9A	250W		PM250 24/13.2	PM250 48/13.2	PM250 110/13.2	PM250 220/13.2
24V	7.8A	187W	PM250 12/24				
24V	10.4A	250W		PM250 24/24	PM250 48/24	PM250 110/24	PM250 220/24
36V	5.2A	187W	PM250 12/36				
36V	6.9A	250W		PM250 24/36	PM250 48/36	PM250 110/36	PM250 220/36
48V	3.9A	187W	PM250 12/48				
48V	5.2A	250W		PM250 24/48	PM250 48/48	PM250 110/48	PM250 220/48
60V	3.1A	187W	PM250 12/60				
60V	4.2A	250W		PM250 24/60	PM250 48/60	PM250 110/60	PM250 220/60
110V	1.7A	187W	PM250 12/110				
110V	2.3A	250W		PM250 24/110	PM250 48/110	PM250 110/110	PM250 220/110

Highlighted types are available now,  
other types will be available during 2005.

### How to read our product code:

Example **PM250 110/24**

**PM250** = Family code

**110** = Input voltage code 110

**24** = Output voltage 24V

## Features

- **Overvoltage protection OVP**  
The output voltage is limited to 15% over nominal output voltage by an extra regulation circuit.
- **Extra output with series diode**  
Use the series diode output when the output is connected in parallel with other power supplies to achieve redundancy.
- **Over / Under voltage alarm**  
The built in relay changes to alarm state if the converter output voltage is not within 90% to 115% of nominal output.  
The user can select NO or NC relay function. The relay rating is 30V 0.5A (d.c. or a.c.)

## Optional Features

- **Inrush current limit with NTC, option H**  
Reduces the inrush current during start up. The input voltage range will be affected. Only available on 110 & 220 input code.
- **Conformally coating, option I**  
For environment with high non condensing humidity max 98% RH.
- **+70°C operating temperature**  
Contact factory for derating as it depends on model. The alarm can not be used at +70°C.
- **Mounting brackets L214-2**  
See figure 4.
- **Mounting brackets L58-1**  
See figure 4.
- **19" frontpanel 2U for two units**  
To mount two PM250 together to form a full 19" rack unit, see figure 3.
- **19" frontpanel 2U for one unit**  
To mount one PM250 to form a full 19" rack unit, see figure 3.
- **EN/IEC61000-4-5 level 4**  
External varistor + surge arrestor mounted from pole to ground. With this filter the input meets level 4 of EN/IEC61000-4-5 (+/-2kV line to line, 4kV line to ground)
- **Train input**  
Input voltage range according to train standard EN50155 and IEC60571.

## General data / input data

Design topology	Push-Pull
Switching frequency	100 kHz
Emission / immunity	See page 4
Safety EN/IEC60950	Class I
Max. accepted input ripple <sup>1</sup> 50-400Hz	2% of nominal voltage
Input power at no load Uout <55 V	Max. 9 W
Input power at no load Uout >55 V	Max. 20 W
Inrush current limit	NTC
<b>Reverse input voltage protection</b>	
24, 48 input code	Parallel diode
110, 220 input code	Series diode
Dimensions (D x W x H)	194x214x58mm
Weight	2.4 kg

- Higher ripple affects the input, contact factory

## Optional T-Inputs

DC inputs mobile		
Uin 0.1s- S2	Continous range	Code
14.4 - 33.6Vd.c.	16.8 - 30Vd.c.	24T
21.6 - 50.4Vd.c.	25.2 - 45Vd.c.	36T
28.8 - 67.2Vd.c.	33.6 - 60Vd.c.	48T
43.2 - 100.8Vd.c.	50.4 - 90Vd.c.	72T
66 - 154Vd.c.	77 - 138Vd.c.	110T

## Mechanical drawing

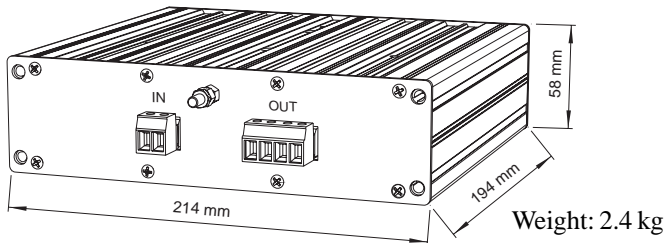


Figure 1. In/out Connector side

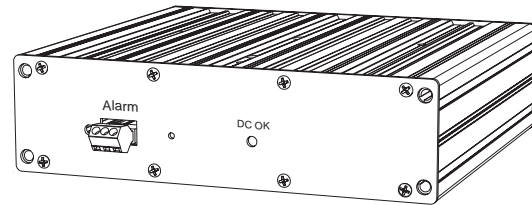


Figure 2. Indicator side

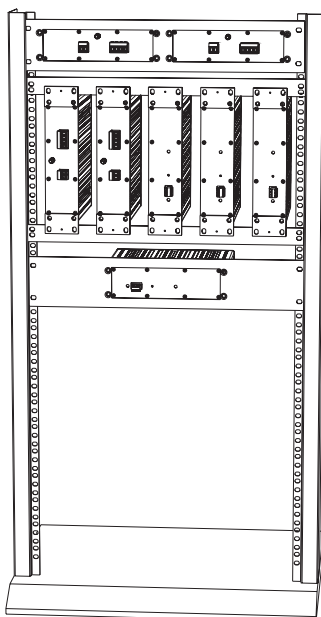


Figure 3. 19"-rack mounting

← Black 19" front panel 2 U for two units PM250 mounted side by side. (Optional).

← 5 units PM250 mounted vertically using brackets PL58-1 and L480-3 (Optional), forming 19" 7U unit.

← Black 19" front panel 2 U for one unit PM250 mounted in the middle. (Optional).

PM250 wall mounted. Using standard brackets L58-1

PM250 wall mounted. Using brackets L214-2 (Optional)

PM250 DIN-Rail mounted. Using DIN-Rail holder (Optional).

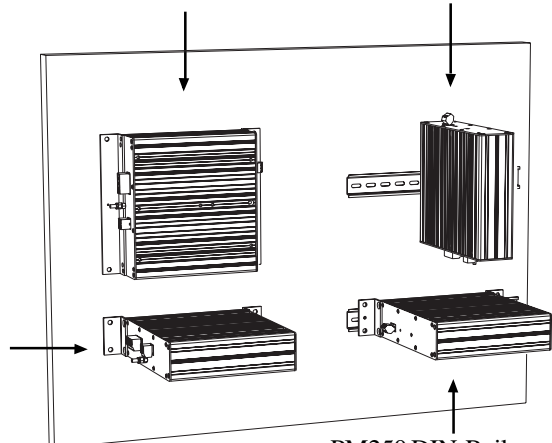


Figure 4. Wall chassis & DIN mounting

PM250 DIN-Rail mounted. Using standard brackets L58-1 and the optional DIN-Rail clips

## Output data

Source regulation	0.1%
Load regulation (0-100% load)	0.3%
Transient recovery time for 10%-90% load step to within 3% of nominal output voltage.	<3ms
Output ripple (60kHz) <sup>2</sup>	30mV p-p
Input ripple attenuation to output (50 to 400 Hz).	500:1
Emission / Immunity	See page 4
Temperature coefficient	0.02% /°C
<b>Min output adjustment range</b> adjustable with a 15 turn potentiometer	
	95% to 110%
Current limit, rectangular.	105%
Remote sense	No
Soft start	Yes
Start-up time	<1s
Hold-up time, contact factory	2-25ms
Efficiency <sup>3</sup>	>80%
Operating temperature range at 100% load. (Convection cooling.) with derating <sup>4</sup>	-25 to +55°C +70°C
Storage temperature range	-40 to +85°C

- The output ripple might increase to 0.5% RMS of Vout, when EN/IEC61000-4-3, 10V/m test is applied
- Lowest efficiency measured within the whole input voltage range at 100% load.
- Contact factory for derating as it depends on model. The alarm relay can not be used at +70°C.

PM250 meets the requirements defined by CE mark as apparatus.

PM250 meets requirements of EMC directive and low voltage directive (LVD).

Thus a PM250 can be used as free standing unit or in installations as well as systems designed according to "The modular approach". PM250 can be used in installation without further EMC tests, if our installation instructions are followed.

Please note that product standards can demand different levels or other basic standard tests. We test according to levels below. For higher levels or other tests, contact factory.

Isolation testable levels	Test voltage
Input / output	2.5kVa.c. / 4kVd.c.
Input / Case	2.5kVa.c. / 4kVd.c.
Output / Case all outputs	2.5kVa.c. / 4kVd.c.
Input / Alarm	2.5kVa.c. / 4kVd.c.
Output / Alarm	2.5kVa.c. / 4kVd.c.
Case / Alarm	2.5kVa.c. / 4kVd.c.

We use the product standard Low voltage power supplies, DC outputs EN/IEC61204-3 and the generic EMC standards:

EN/IEC61000-6-2 (Immunity)

EN/IEC61000-6-3 (Emission)

## EMC

EMC-standards	EMC-performance		
Emission standards	Input	Output	Remarks
EN55011/EN55022 (0.15-30MHz)	Level B	Level B	
EN55011/EN55022 (30-1000MHz)	Level A		Enclosure test
Immunity standards	IEC/EN61000-6-2		
EN/IEC61000-4-2	8 kV/15 kV		Contact / air, Enclosure test
EN/IEC61000-4-3	10 V/m AM-Modulated		Output ripple can increase to 0.5% of Vout Enclosure test
EN/IEC61000-4-3	10 V/m Pulse modulated		Enclosure test
EN/IEC61000-4-4	4 kV	4 kV	
EN/IEC61000-4-5, Input code 24, 48	0.5kV / 1 kV	0.5kV / 1 kV	Line-line 2Ω / Line-case 12Ω
EN/IEC61000-4-5, Input code 110 <sup>1</sup> , 220 <sup>1</sup>	1kV / 2 kV	0.5kV / 1 kV	
EN50155 Figure 4, 1.8kV 1.5/50μs	Yes		Line-case & Line-line 100 Ω
EN/IEC61000-4-6	10 V <sub>RMS</sub>	10 V <sub>RMS</sub>	AM-Modulated
EN/IEC61000-4-8	Not sensitive		Enclosure test
EN/IEC61000-4-10	Not sensitive		Enclosure test

1 Higher level 2kV / 4kV with external filters, contact factory.

## Contact

For updates on this datasheet we refer to [www.polyamp.com](http://www.polyamp.com)  
Specifications subject to change without notice.

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