

## PM50-series 32 to 50 W with 1 & 2 outputs

### Input / Output

- Wide input voltage ranges.
- Input ranges from 10 to 270 Vd.c.
- Single outputs from 12 to 132 Vd.c.
- Two isolated outputs 12-16, 18 or 60 Vd.c.
- Reverse input voltage protection.

### Operation

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

### Single outputs PM50

### Features

- Conformally coating; tropical version for environment with high non condensing humidity max 98 % RH.
- Wall or DIN-rail mounting.
- One unit covers many output voltages.
- Output voltage adjustable on frontpanel.

### EMC

- EN/IEC 61000-6-3 Emission.
- EN/IEC 61000-6-2 Immunity.
- EN/IEC 61000-4-4, 4 kV.
- EN/IEC 61000-4-5 level 2 & 3.

Output			Input				Connection
Voltage	Current	Power	10 - 30 V	20 - 60 V	50 - 150 V	90 - 270 V	
12 V	2.67 A	32 W	PM50A15-15				Parallel
12 V	3.34 A	40 W		PM50B15-15	PM50C15-15	PM50D15-15	Parallel
15 V	2.67 A	40 W	PM50A15-15				Parallel
15 V	3.34 A	50 W		PM50B15-15	PM50C15-15	PM50D15-15	Parallel
18 V	2.60 A	47 W	PM50A18-18				Parallel
18 V	3.20 A	57 W		PM50B18-18			Parallel
18 V	2.78 A	50 W			PM50C18-18		Parallel
24 V	1.34 A	32 W	PM50A15-15				Series
24 V	1.67 A	40 W		PM50B15-15	PM50C15-15	PM50D15-15	Series
28 V	1.34 A	37 W	PM50A15-15				Series
28 V	1.67 A	47 W		PM50B15-15	PM50C15-15	PM50D15-15	Series
36 V	1.30 A	47 W	PM50A18-18				Series
36 V	1.60 A	57 W		PM50B18-18			Series
36 V	1.39 A	50 W			PM50C18-18		Series
60 V	0.67 A	40 W	PM50A60-60				Parallel
60 V	0.84 A	50 W		PM50B60-60	PM50C60-60	PM50D60-60	Parallel
110 V	0.34 A	37 W	PM50A60-60				Series
110 V	0.42 A	46 W		PM50B60-60	PM50C60-60	PM50D60-60	Series

### How to read our product code:

Example **PM50B15-15**

**PM50** = Family code

**B** = input voltage code B

**15-15** = two outputs with nom. voltage 12-16 V

# Dual outputs

Outputs					Input			
Voltage	Current	Voltage	Current	Power	10 - 30 V	20 - 60 V	50 - 150 V	90 - 270 V
12 V	1.34 A	12 V	1.34 A	32 W	PM50A15-15			
12 V	1.67 A	12 V	1.67 A	40 W		PM50B15-15	PM50C15-15	PM50D15-15
15 V	1.34 A	15 V	1.34 A	40 W	PM50A15-15			
15 V	1.67 A	15 V	1.67 A	50 W		PM50B15-15	PM50C15-15	PM50D15-15
18 V	1.30 A	18 V	1.30 A	47 W	PM50A18-18			
18 V	1.60 A	18 V	1.60 A	57 W		PM50B18-18		
18 V	1.39 A	18 V	1.39 A	50 W			PM50C18-18	
60 V	0.34 A	60 V	0.34 A	40 W	PM50A60-60			
60 V	0.42 A	60 V	0.42 A	50 W		PM50B60-60	PM50C60-60	PM50D60-60

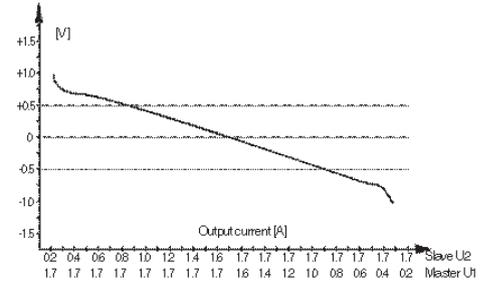


Figure 1. Voltage difference between U1 & U2 Depending on load difference on PM50\*15-15. On PM50\*60-60 the voltage difference is relatively smaller.

## DC Inputs

Nominal inputs	Input range	Code
12, 24 Vd.c.	10 - 30 V	A
24, 28, 36, 48 Vd.c.	20 - 60 V	B
72, 96, 110, 127 Vd.c.	50 - 150 V	C
110, 127, 220, 250 Vd.c.	90 - 270 V	D

Input voltages meeting train standard EN 50155/IEC 60571, can be made on demand.

## General data / input data

Design topology	Fly back
Switching frequency	Typ. 45 kHz
Emission / Immunity	See page 4
Safety EN/IEC 60950	Class I
Max. accepted input ripple <sup>1</sup> 50-400 HZ	2 % of nominal
Input power at no load	<5 W
Inrush current limit	No
<b>Reverse input voltage protection</b>	
A, B input code	Parallel diode
C, D input code	Series diode
Dimension (D x W x H)	157 x 106 x 48 mm
Weight	0.65 kg

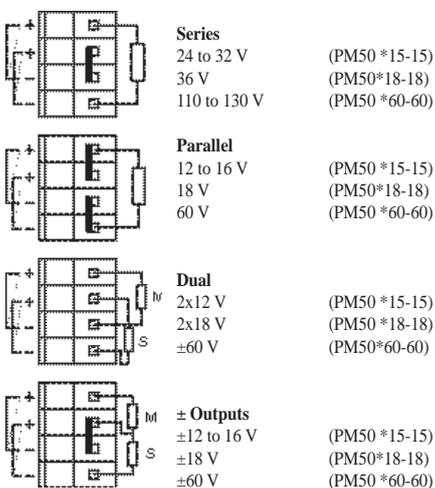
## Output data

Source regulation	0.2 %
Load regulation parallel outputs	0.2 %
Load regulation with series connected outputs 10-100 % load.	1 %
Load regulation on U1	0.2 %
Load regulation on U2	See figure 1
Transient recovery time for 10 - 90% load step to within 3 % of nominal output voltage.	Typ. <3 ms
<b>Output ripple (45 kHz)<sup>2</sup></b>	
PM50A15-15, PM50*15-15	Typ. 1 mV <sub>RMS</sub>
PM50A60-60, PM50*60-60	Typ. 2 mV <sub>RMS</sub>
Input ripple attenuation to output (50 to 400 Hz)	150:1
Emission / Immunity	See page 4
Temperature coefficient	0.02 %/°C
<b>Output voltage adj. range</b>	
PM50*15-15	12 - 16 V
PM50*18-18	17 - 20 V
PM50*60-60	54 - 66 V
Current limit, fold-back.	See figure 2
Remote sense	No
Soft start	No
Start-up time	1s
Hold-up time, contact factory	2-25 ms
Efficiency <sup>3</sup>	78-85 %
Operating temperature range at 100 % load.	-25 to +55 °C
Storage temperature range	-40 to +85 °C

1. Higher ripple affects the input, contact factory

## How to connect the output

Use the supplied jumpers shown below



\*= Input voltage code. M = Master output U1. S= Slave output U2.

Figure 3. Jumper position on PM50 connector. (Series & Parallel)

- The output ripple might increase to 0.5 % RMS of  $V_{out}$ , when EN/IEC 61000-4-3, 10 V/m test is applied
- Lowest efficiency measured within the whole input voltage range at 100 % load.

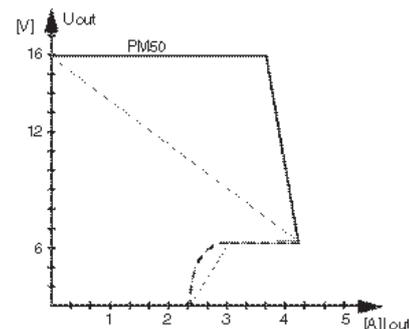
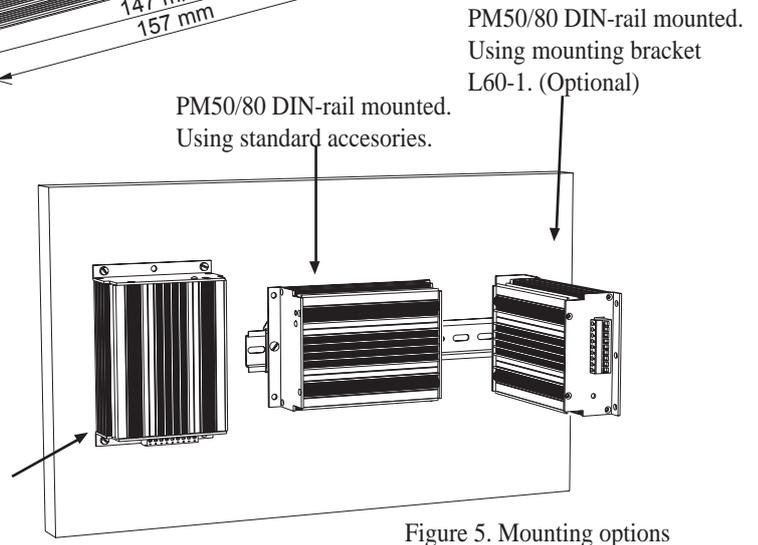
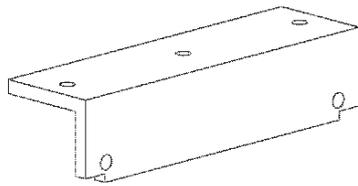
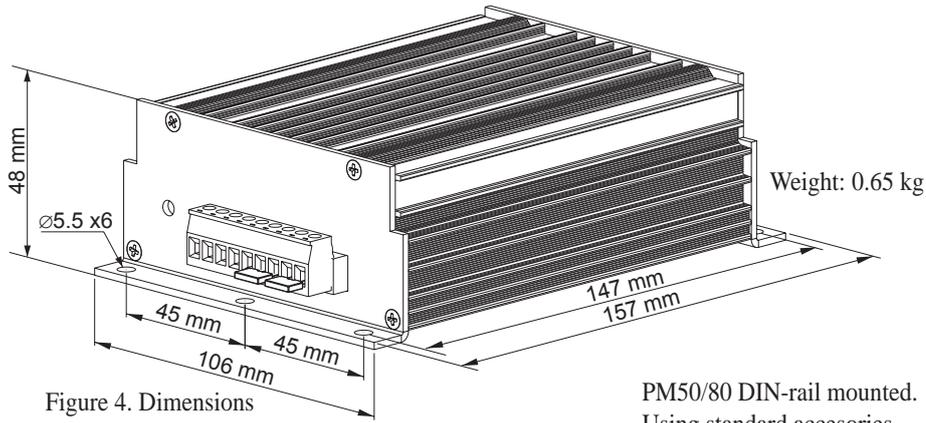
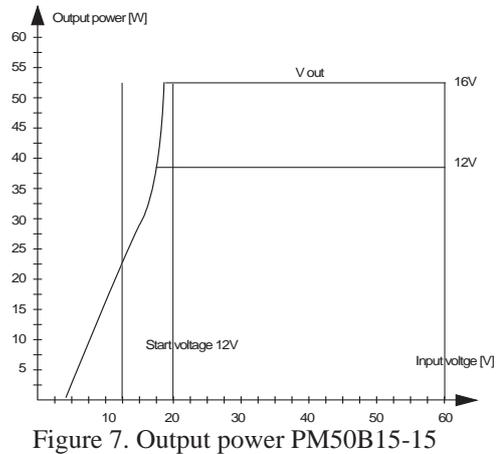
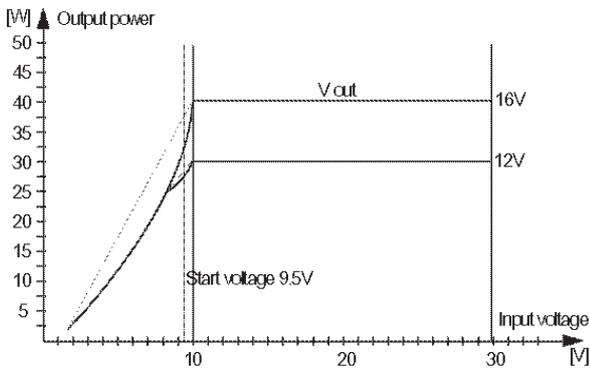


Figure 2. Current limit characteristic for PM50\*15-15 with outputs connected in parallel.

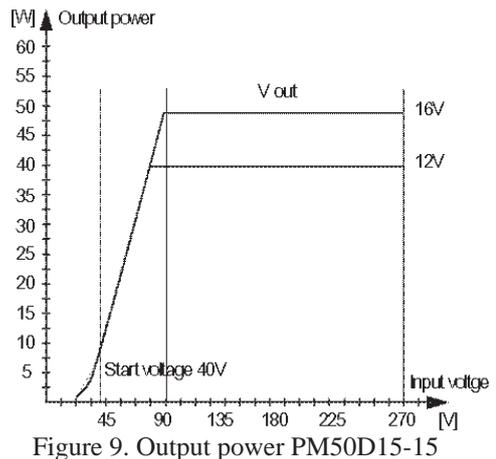
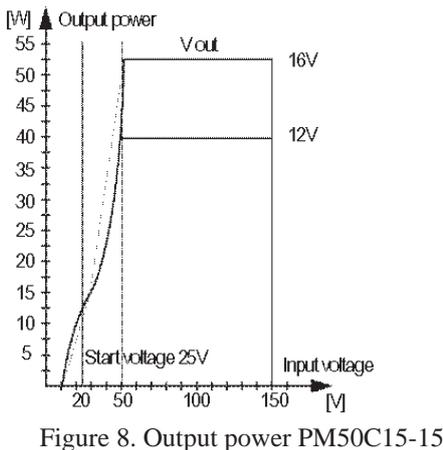
# Mechanical drawing



## Output voltage/power characteristics



The PM50 series have no low input voltage lock-out, which stops the converter. The output power is instead automatically derated, see figures 6 to 9. Example: PM50A15-15, figure 6, has start voltage at 9.5 V and can supply 15 W output power at 6 V input.



## Safety and EMC



## Safety standard EN/IEC 60950

PM50 meets the requirements defined by CE mark as apparatus.

PM50 meets requirements of EMC directive and low voltage directive (LVD).

Thus a PM50 can be used as free standing unit or in installations as well as systems designed according to "The modular approach". PM50 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: Input code A, B	2 kVd.c.
Input code C, D	2.5 kVa.c. / 4 kVd.c.
Input / Case: Input code A, B	2 kVd.c.
Input code C,D	2.5 kVa.c. / 4 kVd.c.
Output / Case all outputs	1 kVd.c.
Between U1 / U2	500 Vd.c.

We use the product standard Low voltage power supplies, DC outputs EN/IEC 61204-3 and the generic EMC standards:  
EN/IEC 61000-6-2 (Immunity)  
EN/IEC 61000-6-3 (Emission)

## EMC

EMC-standards	EMC-performance		Remarks
<b>Emission standards</b>	<b>Input Level B</b>	<b>Output Level B</b>	
EN 55011/EN 55022 (0.15-30 MHz)			
EN 55011/EN 55022 (30-1000 MHz)	Level B		Enclosure test
<b>Immunity standards</b>	<b>EN/IEC 61000-6-2</b>		
EN/IEC 61000-4-2	8 kV/15 kV		Contact / air, Enclosure test
EN/IEC 61000-4-3	10 V/m AM-Modulated		Output ripple can increase to 0.5 % of Vout Enclosure test
EN/IEC 61000-4-4	4 kV	4 kV	
EN/IEC 61000-4-5, input code A, B EN/IEC 61000-4-5, input code C, D	0.5 kV / 1 kV 1 kV / 2 kV <sup>1</sup>	0.5 kV / 1 kV 0.5 kV / 1 kV	Line-line 2 Ω / Line-case 12 Ω
EN 50121-3-2/IEC 62236-3-2	1 kV / 2 kV	1 kV / 2 kV	Line-line 42 Ω / Line-case 42 Ω
EN/IEC 61000-4-6	10 V <sub>RMS</sub>	10 V <sub>RMS</sub>	AM-Modulated
EN/IEC 61000-4-8	Not sensitive		Enclosure test
EN/IEC 61000-4-10	Not sensitive		Enclosure test

1 Optional level 2 kV / 4 kV 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.



Polyamp AB Box 229 597 25 Åtvidaberg Sweden  
Telephone: +46 120 854 00 Telefax: +46 120 854 05  
<http://www.polyamp.com>  
E-mail: [info@polyamp.se](mailto:info@polyamp.se)

### Distributor

Schulz-Electronic GmbH  
Dr.-Rudolf-Eberle-Straße 2  
D-76534 Baden-Baden  
Fon +49.7223.9636.30  
Fax +49.7223.9636.90  
[vertrieb@schulz-electronic.de](mailto:vertrieb@schulz-electronic.de)  
[www.schulz-electronic.de](http://www.schulz-electronic.de)