



## PM500-series 260 to 500 W

### INPUT / OUTPUT

- Optimized input voltage ranges
- Input ranges from 50 to 300 Vd.c.
- Single outputs from 13.2 to 110 Vd.c.
- Reverse input voltage protection
- Input EN 50155 / IEC 60571

### FEATURES

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

### OPERATION

- Operating temperature range -25 to +70 °C.
- High efficiency.
- Fully encapsulated, meets IP20 as standard.
- Convection cooled.

### 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.
- EN60950-1
- RoHS directive

INPUT			
Nominal inputs	Input range	Stop level	Code
110, 127 Vd.c.	93-150 V	< 77 Vd.c.	110
72, 96, 110, 127 Vd.c.	50-150 V	< 50 Vd.c.	110C
220, 250 Vd.c.	187-300 V	< 154 Vd.c.	220
110, 127, 220, 250 Vd.c.	100-300 V	< 100 Vd.c.	220D

OUTPUT		
Voltage	Current	Power
13.2 V	20.0 A	260 W
24 V	20.0 A	500 W
48 V	10.5 A	500 W
110 V	4.5 A	500 W

## OUTPUT RATING & TYPE CODE

OUTPUT			INPUT			
Voltage	Current	Power	50 - 150 V	93 - 150 V	100 - 300 V	187 - 300 V
13.2 V	20.0 A	260 W	PM260 110C/13.2		PM260 220D/13.2	
24 V	20.0 A	500 W		PM500 110/24		PM500 220/24
28 V	15.0 A	420 W		PM500 110T/28 <sup>1</sup>		PM500 220T/28 <sup>2</sup>
48 V	10.5 A	500 W		PM500 110/48		PM500 220/48
110 V	4.5 A	500 W		PM500 110/110		PM500 220/110

Train Inputs

1) 110T = 77 - 150 Vdc

2) 220T = 154 - 300 Vdc

How to read our product code: Example PM500 110/24

PM500 = 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 30 V 0.5 A (d.c. or a.c.), for higher voltage please contact Polyamp.

### Inrush current limit

Reduce the inrush current during start up. the input voltage range will be affected.

### Over temperature shutdown protection

The unit switch-off and restart with hysteresis. Red LED indication and alarm.

### Operating temperature range

The PM500 series is rated to +55°C @ 100% load and continuous operation. However PM500 is designed for operation up to +70°C with derating. Temporary temperature rise e.g. as described in EN50155 T3 up to +85°C can be accepted as the cooling system has a thermal inertia. -40°C is optional as we need to test each batch.

## OPTIONAL FEATURES

### 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.

### Mounting brackets L214-2

See figure 4.

### Mounting brackets L58-1

See figure 4.

### 19" frontpanel 2U for two units

To mount two PM500 together to form a full 19" rack unit, see figure 3.

### 19" frontpanel 2U for one unit

To mount one PM500 to form a full 19" rack unit, see figure 3.

### DIN-rail mounted

Using DIN-Rail holder, see figure 4

### EN/IEC 61000-4-5 level 4

External varistor + surge arrester mounted from pole to ground. With this filter the input meets level 4 of EN/IEC 61000-4-5 (+/-2 kV line to line, 4 kV line to ground)

### Train input

Input voltage range according to train standard EN 50155 and IEC 60571, see train T-inputs page 3.

## GENERAL DATA / INPUT DATA

LABEL	VALUE
Design topology	Push-Pull
Switching frequency	200 kHz
Emission / Immunity	See page 4
Safety EN/IEC 60950	Class I
Max. accepted input ripple <sup>1</sup> 0-400 Hz	2 % of nom. voltage
Input power at no load	Typ 10 W
Reverse input voltage protection	In start up sequence <sup>2</sup>
<b>Vibration and shock</b>	
EN/IEC 61373 Body mounted	Class B
IEC 60721-3-5 Ground vehicle installation	Class 5M2
IEC 60068-2-27: 2008 Bump	30 g 6 ms
IEC 60068-2-64: 2008 Random vibration	1.68 gRMS
FIRE PROTECTION EN 45545-2	"Non listed product" 4.2.2. < 100 g
Dimensions (D x W x H)	194 x 214 x 58 mm
Weight	2.4 kg

- Higher ripple affects the input, contact factory
- The converter does not start reverse voltage.

## OPTIONAL T-INPUTS

DC INPUTS MOBILE		
U <sub>in</sub> 0.1s-S2	Continous range	Code
66 - 154 Vd.c	77 - 150 Vd.c.	110T
132 - 308 Vd.c.	154 - 300 Vd.c.	220T

Input voltage range according to train standard EN 50155 and IEC 60571

## OUTPUT DATA

LABEL	VALUE
Source regulation	0.1 %
Load regulation (0 to 100 % load)	< 0.2 V
Transient recovery time for 10 to 90 % load step to within 3 % of nominal output voltage.	< 3 ms
Output ripple (200 kHz) <sup>3</sup>	30 mV p-p
Input ripple attenuation to output (50 to 400 Hz)	500:1 or -54 dB
Emission / Immunity	See page 4
Temperature coefficient	0.02 % / °C
Min output adjustment range adjustable with a 15 turn potentiometer	95 - 110 %
Current limit, rectangular	105 %
Remote sense	No
Soft start	Yes
Start-up time	< 1 s
Hold-up time, contact factory	2 - 25 ms
Efficiency <sup>4</sup>	> 88 %
Operating temperature range at 100 % load. (Convection cooling) with derating <sup>5</sup>	-25 to +55 °C +70 °C
Storage temperature range	-40 to +85 °C

- The output ripple might increase to 1 % RMS of V<sub>out</sub>, when EN/IEC 61000-4-3, 20V/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.

## MECHANICAL DRAWING

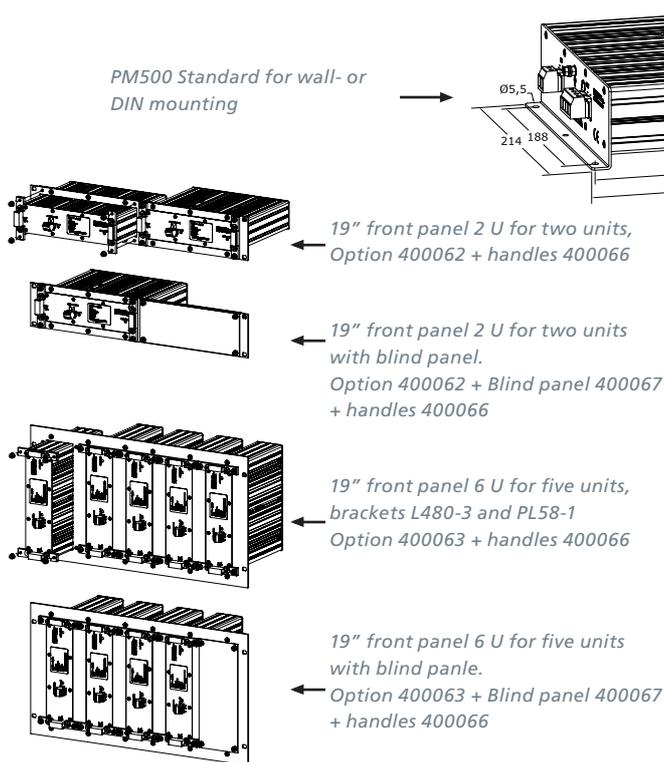


Figure 2. 19"-rack mounting PM500 R

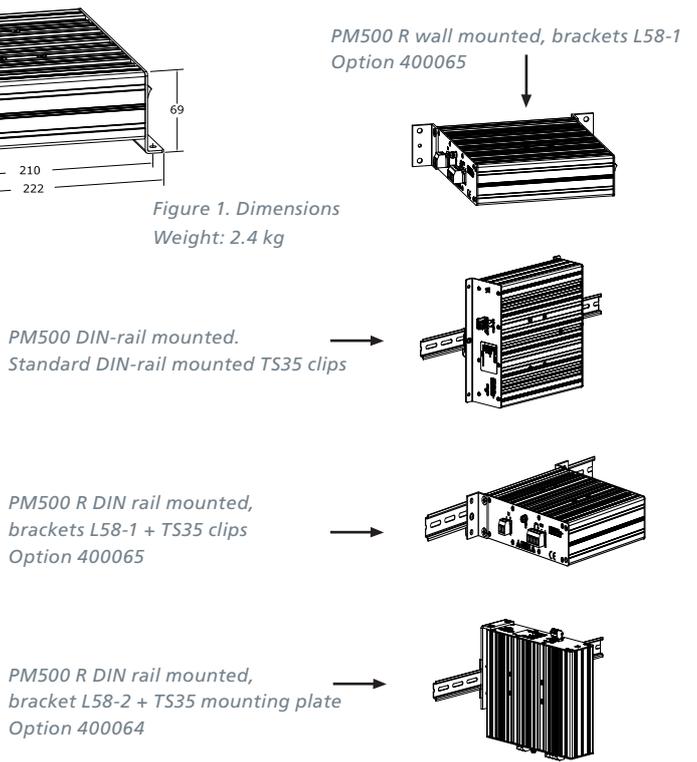


Figure 4. Wall, chassis & DIN mounting

## SAFETY AND EMC

PM500 meets the requirements defined by CE mark as apparatus.

PM500 meets requirements of EMC directive and low voltage directive (LVD).

Thus a PM500 can be used as free standing unit or in installations as well as systems designed according to "The modular approach". PM500 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.

## SAFETY STANDARD EN/IEC 60950

ISOLATION TESTABLE LEVELS	TEST VOLTAGE
Input / Output	3 kVa.c. / 4.3 kVd.c.
Input / Alarm	3 kVa.c. / 4.3 kVd.c.
Input / Case	2.5 kVa.c. / 3.6 kVd.c.
Output / Case all outputs	2.5 kVd.c.
Output / Alarm	2.5 kVd.c.
Case / Alarm	2.5 kVd.c.

We use the product standard Low voltage power supplies, DC outputs EN/IEC 61204-3 and the generic EMC standards:

- EN/IEC 61000-6-1 (Immunity)
- EN/IEC 61000-6-2 (Immunity)
- EN/IEC 61000-6-3 (Emission)
- EN/IEC 61000-6-4 (Emission)

## EMC

EMC-STANDARDS	EMC-PERFORMANCE		Remarks
Emission standards	Input	Output	
EN 55016 / CISPR16 (0.15-30 MHz)	OK	OK	opt. EN 55022 level B
EN 55016 / CISPR16 (30-1000 MHz)	OK		Enclosure test
Immunity standards	EN/IEC 61000-6-2		
EN/IEC 61000-4-2	8 kV / 8 kV		Contact / air, Enclosure test
EN/IEC 61000-4-3	20 V/m AM-Modulated		Output ripple can increase to 1 % of Vout Enclosure test
EN/IEC 61000-4-4	± 4 kV	± 4 kV	
EN/IEC 61000-4-5, EN 50121-4	± 1 kV / ± 2 kV	± 1 kV / ± 2 kV	Line-line 2 Ω / Line-case 12 Ω
EN/IEC 50121-3-2	± 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

### Distributor



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