POLYAMP

- A secure part of your system

DC/DC Converters
PM500 series
260 to 500 W

INPUT / OUTPUT

- Optimized input voltage ranges
- Input ranges from 43 to 300 Vd.c.
- Single outputs from 13.2 to 120 Vd.c.
- Inrush current limit
- Reverse input voltage protection
- Input EN 50155 IEC 60571

FEATURES

- Overvoltage protection OVP
- Alarm circuit with relay
- Inhibit input / Power down
- Output voltage adjustable on front panel

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 61000-4-3, 20 V/m
- EN IEC 61000-4-4, 4 kV.
- EN IEC 61000-4-5 level 2 & 3.
- EN 50121-3-2 train

INPUT			
Nominal inputs	**Input range**	**Stop level**	**Code**
48 Vd.c.	43 - 60 V	< 33 V	48
24, 48 Vd.c.	20 - 60 V	< 17 V	48B
110, 127 Vd.c.	93 - 150 V	< 77 V	110
72, 96, 110, 127 Vd.c.	50 - 150 V	< 50 V	110C
220, 250 Vd.c.	187 - 300 V	< 154 V	220
110, 127, 220, 250 Vd.c.	100 - 300 V	< 100 V	220D

Other input ranges can be made on demand.
Input range, is the range we guarantee full output performance, Uout +10%, Iout +5%.
The converter works down to the stop levels.
The output voltage might decrease to approx. -10% of nominal output at the stop level.

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

DC OUTPUT		
Voltage	Current	Power
13.2	20 A	260 W
Voltage	Current	Power
24 V	20.0A	500 W
28 V	15.0 A	420 W
48 V	10.5 A	500 W
53.2V	9.5 A	500 W
110 V	4.5 A	500 W

DC INPUT		
	50 - 150 V	100 - 300 V
	PM260 110C/13.2	PM260 220D/13.2
43 - 60V	93 - 150 V	187 - 300 V
PM500 48/24	PM500 110/24	PM500 220/24
PM500 48/28	PM500 110/T28	PM500 220/T28
PM500 48/48	PM500 110/48	PM500 220/48
PM500 48/53	PM500 110/53	PM500 220/53
PM500 48/53.2	PM500 110/110	PM500 220/110

How to read our product code:
Example PC1000 110/48
PC1000 = Family code and power
110 = Input voltage code 110
48 = Output voltage 48 V

NRE might be changed if other input/output combinations are demanded

T= Train Inputs
1) 110T = 77 - 150 Vd.c.
2) 220T = 154 - 300 Vd.c.

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 0.3 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 EN 50155 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.

T-INPUT RANGES MOBILE APPLICATIONS			
Input	Uin range S1	Uin 0.1s S2	Code
36 V	25.2 - 45 V	21.6 - 50.4 V	36T
48 V	33 - 60 V	28.8 - 69 V	48T
72 V	50.4 - 90 V	43 - 101 V	72T
110 V	77 - 138 V	66 - 154 V	110T

OPTIONAL FEATURES

Train input

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

Current Share, option CR

Passive current share - virtual series resistor

Conformally coating, option I

For environment with high non condensing humidity max 98 % RH.

-40 or +70 °C operating temperature

For temperature extensions like -40°C, +70°C and T3 +85°C 10 min, please contact factory, as rating depends on model.

EN IEC 61000-4-5 level 4

External varistor + surge arrestor mounted from pole to ground. With this filter the input meets level 4 of EN IEC61000-4-5 (+/-2 kV line to line, 4 kV line to ground)

Mounting brackets L58-1 or L214-2

Se figure 4.

19” front panel 2U for two units

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

19” front panel 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

GENERAL DATA | INPUT DATA

LABEL	VALUE
Design topology	Push-Pull
Switching frequency	200 kHz
Emission / Immunity	See page 4
Electric Safety EN IEC61204-7:2018	Class I, See page 4
Ingression Protection IP	IP20
Max. accepted input ripple[1] 50 - 400 Hz	2 % of nominal voltage
Reverse input voltage protection	In start-up sequence[2]
Vibration and shock	
EN/IEC 61373 Body mounted	Class B
IEC 60721-3-5	Class 5M2
IEC 60068-2-27 Bump	30 g 6 ms
IEC 60068-2-64 Random vibration	1.68gRMS
EN 45545-2 Fire protection 4.3.2 rule 1 and figure 1	HL1, HL2, HL3
Dimensions (D x W x H)	194 x 214 x 58 mm
Weight	2.4 kg
Power connectors	0.25 - 4 mm^2
Signal connectors	0.25 - 2.5 mm^2

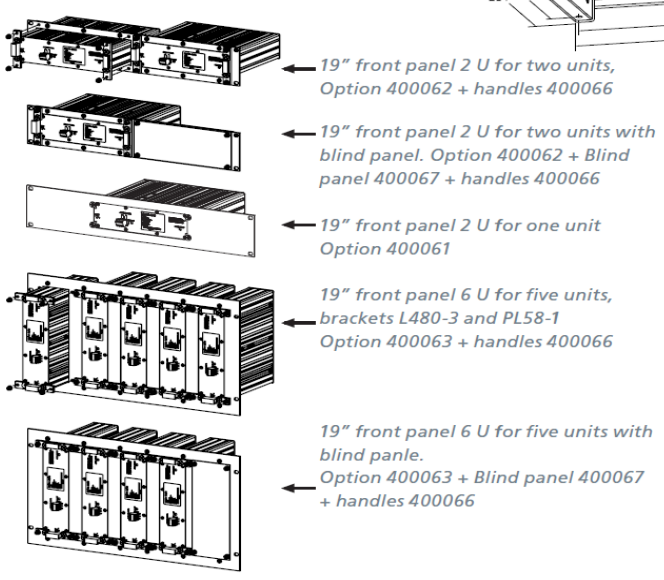
1. Higher ripple affects the input, contact factory
2. The converter do not start at reverse voltage
3. The output ripple might increase to 0.5% RMS of Vout, when IEC 61000-4-3, 20 V/m test is applied
4. Relay is also rated 300 Vdc 20 mA, switch current depends on voltage

OUTPUT DATA

LABEL	VALUE
Source regulation	0.1%
Load regulation (0 to 100% load) with sense connected	0.2%
Load regulation (0-100% load)	0.5%
Transient recovery time for 10 to 90% load step to within 3% of nominal output voltage.	<3 ms
Output ripple (200 kHz) Vp-p[3]	30 mVp-p
Input ripple attenuation to output 50 to 400 Hz	150:1
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	Yes
Softs start	Yes
Alarm relay rating (a.c. & d.c.)	30 V 300 mA[4]
Start up time	< 3 s
Hold up time, contact factory	2 - 25 ms
Efficiency[5]	89 - 93%
Operating temperature range at 100% load. (Convection cooling) with derating[6]	-25 to +55°C -25 to +70°C
Storage temperature range	-40 to + 85°C

5. Lowest efficiency measured within the whole input voltage range at 100% load
6. Contact factory for derating as depends on model. The alarm relay can not be used at +70°C

Option:19" rack mounting



Standard mechanics and optional DIN rail

PM500 Standard for wall- or DIN mounting

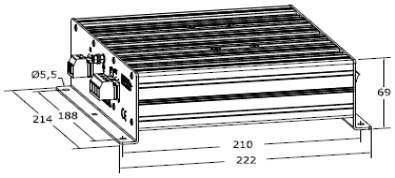
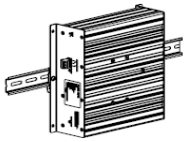


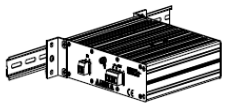
Figure 1. Dimensions
Weight: 2.4 kg

PM500 R wall mounted, brackets L58-1 Option 400065

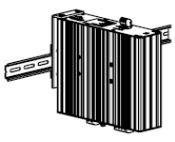
PM500 DIN-rail mounted. Standard DIN-rail mounted TS35 clips



PM500 R DIN rail mounted, brackets L58-1 + TS35 clips Option 400065



PM500 R DIN rail mounted, bracket L58-2 + TS35 mounting plate Option 400064



CE MARK

PM500-series meets the requirements defined by CE mark as an apparatus.

This means they meet requirements stated by EMC directive and low voltage directive (LVD) as well as 2015/863 (RoHS 3) directive.

PM500--series is in respect to EMC, as stand alone unit. Can also be installed in any other environment by a professional installer.

PM500-series use the electric safety standard EN IEC 61204-7:2018. On EMC it meets the requirements of EN IEC 61204-3:2018, and the generic EMC standards:

EN IEC 61000-6-2 (Immunity)
EN IEC 61000-6-3 (Emission)

SAFETY STANDARD IEC 61204-7:2018

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	3 kVa.c.| 4.3 kVd.c.
Output/Case	2.5 kVd.c.
Output/Alarm	2.5 kVd.c.

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.

EMC

EMC STANDARDS	TEST VOLTAGE		NOTES
Emission standards	**EN IEC 61000-6-3**		**Commercial and light-industrial environments**
	Input	**Output**	
EN 55016 CISPR16 (0.15 - 30 MHz)	OK	OK	Optional EN 55022 level B
EN 55016 CISPR16 (30 - 1000 MHz)	OK		Enclosure test
Immunity standards	**EN IEC 61000-6-2**		**Industrial environments**
EN IEC 61000-4-2	8 kV | 15 kV		Connectors | Air, Enclosure test
EN IEC 61000-4-3, see note 3	20 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 EN 50121-3-2, EN 50121-4 train	±1 kV | ±2 kV ±1 kV | ±2 kV	±1 kV | ±2 kV ±1 kV | ±2 kV	Line-line 2 Ω | Line-case 12 Ω Line-line 42 Ω | Line-case 42 Ω
EN IEC 61000-4-6	10 V_{RMS}	10 V_{RMS}	AM-modulated
EN IEC 61000-4-8	Not sensitive		Enclosure test
EN IEC 61000-4-10	Not sensitive		Enclosure test

We use the EMC product standard "Low voltage power supplies DC output" EN 61204-3 as base for measurement principles. The Immunity EMC levels are elevated in order to comply to EN 50121-3-2 (IEC 62236-3-2) Railway application: Rolling stock – Apparatus, and EN 50121-4 (IEC 62236-4) , Railway application: Signaling and telecommunication apparatus. Also to meet relevant parts of IEC 61000-6-5 Generic Standards – Immunity for power stations and substation environments.

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POLYAMP
- A secure part of your system