PU500

DC-DC Converter

POLYAMP

PU500-series 400 to 500W

Input / Output

- Optimized input voltage ranges.
- Input ranges from 18 to 300V.
- Single outputs from 24 to 60 Vd.c.
- Reverse input voltage protection.

Operation

- High efficiency >88%
- Operating temperature range -25 to +55°C.
- Fully encapsulated, meets IP20 as standard.
- Convection cooled.

Features

- Overvoltage protection OVP.
- Over/Under voltage alarm relay.
- Remote sense.
- Inhibit input / Power down.

EMC

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

Input and output ratings

Nominal inputs	Input range	Code
24 Vd.c.	18 to 32V	24
48 Vd.c.	38 to 60V	48
110, 127 Vd.c.	88 to 150V	110
220, 250 Vd.c.	175 to 300V	220

Input voltages meeting train standard EN50155/IEC60571, can be made on demand.

Output		
Voltage	Current	Power
24V	16.7 - 20.9A	400 - 500W
28V	14.3 - 17.9A	400 - 500W
36V	11.2 - 13.9A	400 - 500W
48V	8.4 10.5A	400 - 500W
60V	6.7 - 8.4A	400 - 500W

Output ratings and type code

Output			Input			
Voltage	Current	Power	18 - 32V	38 - 60V	88 - 150V	175 - 300V
24V	16.7A	400W	PU500 24/24			
24V	20.9A	500W		PU500 48/24	PU500 110/24	PU500 220/24
28V	14.3A	400W	PU500 24/28			
28V	17.9A	500W		PU500 48/28	PU500 110/28	PU500 220/28
36V	11.2A	400W	PU500 24/36			
36V	13.9A	500W		PU500 48/36	PU500 110/36	PU500 220/36
48V	8.4A	400W	PU500 24/48			
48V	10.5A	500W		PU500 48/48	PU500 110/48	PU500 220/48
60V	6.7A	400W	PU50024/60			
60V	8.4A	500W		PU500 48/60	PU500 110/60	PU500 220/60

How to read our product code:
Example **PU500 24/48**
PU500 = Family code
24 = input voltage code 24
48 = Output voltage 48V

Features

- **Overvoltage protection OVP**
  The output voltage is limited to 15% over nominal output voltage by an extra regulation circuit.
- **Remote Sense**
  External sense is used when the voltage regulation at the load is critical.
  The sense can compensate voltage drops up to 5% of the nominal voltage.
- **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.)
- **Inhibit input / Power down**
  This input allows remote start and shutdown of the converter by a signal voltage of 5 to 12V. Max 35mA.

Optional Features

- **Extra output with series diode**
  Use the series diode output when the output is connected in parallel with other power supplies to archive redundancy.
- **Inrush current limit with NTC**
  Reduces the inrush current during start up.
  The input voltage range will be affected.
  Only available on 110 & 220 input code.
- **Conformally coating**
  For environment with high non condensing humidity max 85% RH.
- **Mounting brackets L216-1**
  Se figure 3.
- **19” Rack mounting set**
  To mount two PU500 together to form a full 19” rack unit, see figure 2.
- **19” Rack mounting bracket**
  To mount one PU500 to form a full 19” rack unit, see figure 2.
- **Empty box**
  To produce a full 19”-rack unit. Includes 19”-rack mounting set, see top section of figure 2. (One converter replaced by empty box.)
- **Train input**
  Input voltage range according to train standard EN50155 and IEC60571.

General data / input data

Design topology	Push-Pull
Switching frequency	40 kHz
Emission / immunity	See page 4
Safety EN/IEC60950	Class I
Max. accepted input ripple[1] 50-400Hz	1% of nominal voltage
Input power at no load	
Uout <36 V	Max 10 W
Uout 36-50 V	Max 12 W
Uout 60 V	Max 17 W
Reverse input voltage protection	
24, 48 input code	Parallel diode
110, 220 input code	Series diode
Dimensions (D x W x H)	232x210x86mm
Weight	4.2 kg

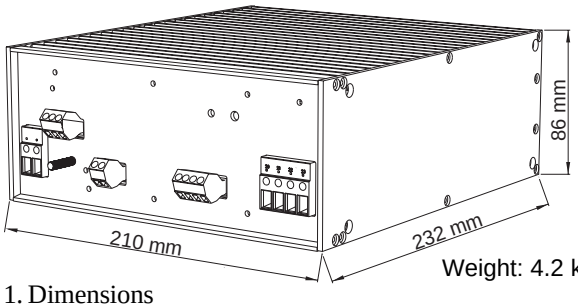
1. Higher ripple affects the input, contact factory

Output data

Source regulation	0.1%
Load regulation (0-100% load)	0.2%
Transient recovery time for 10%-90% load step to within 3% of nominal output voltage.	<3ms
Output ripple (80kHz) 2 Vp-p[2]	Typ. 15mV
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% to 110%
Current limit, rectangular.	105%
Remote sense	Yes
Soft start	Yes
Start-up time	1s
Hold-up time, contact factory	2-25ms
Efficiency[3]	88-91%
Operating temperature range at 100% load. (Conduction cooling.) with derating[4]	-25 to +55°C -25 to +70°C
Storage temperature range	-40 to +85°C

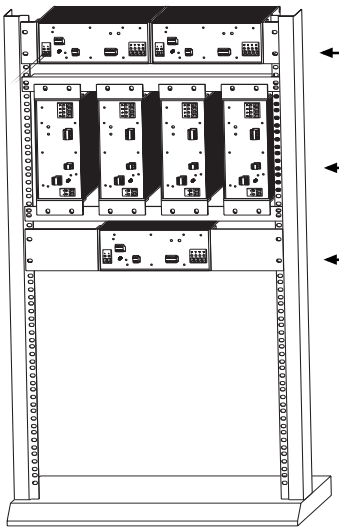
2. Output ripple might increase to 0.5% RMS of Vout, when EN/IEC61000-4-3, 10V/m test is applied
3. Lowest efficiency measured within the whole input voltage range at 100% load.
4. Contact factory for derating as it depends on model. The alarm relay can not be used at +70°C.

Mechanical drawing



Weight: 4.2 kg

Figure 1. Dimensions



2 units PU300/500 mounted side by side forming one 19" unit using 19" rack mounting set.(Optional)

4 units PU300/500 mounted verticaly using standard L86-1 brackets and L480-1 (Optional).

Single unit PU300/500 mounted as one 19" unit using L86-3 brackets (Optional).

Figure 2. 19"-rack mounting

PU300/500 wall mounted. Using mounting brackets L216-1 (Optional)

PU300/500 wall mounted. Using standard brackets L86-1

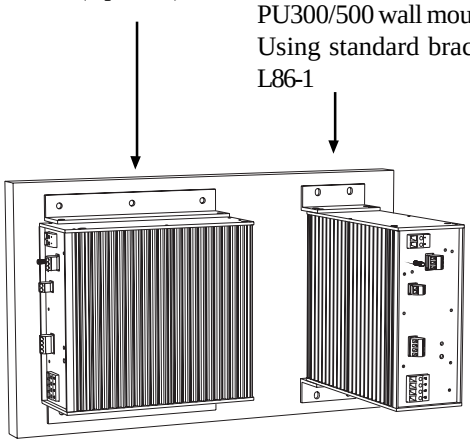


Figure 3. Wall and chassis chassis mount

Safety and EMC

PU500 meets the requirements defined by CE mark as apparatus.
PU500 meets requirements of EMC directive and low voltage directive (LVD).
Thus a PU500 can be used as free standing unit or in installations as well as systems designed according to ”The modular approach”. PU500 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 IEC60950

Isolation testable levels		Test voltage
Input / output:	Input code: A, B	2kVd.c.
Input code: C, D		2.5kVa.c. / 4kVd.c.
Input / Signal*	Input code: A, B	2kVd.c.
	Input code: C, D	2.5kVa.c. / 4kVd.c.
Input / Case	Input code: A, B	2kVd.c.
	Input code: C, D	2.5kVa.c. / 4kVd.c.
Output / Case all outputs		2kVd.c.
Case / Signal*	Input code: A, B	2kVd.c.
	Input code: C, D	2.5kVa.c. / 4kVd.c.
Output / Case all outputs		2kVd.c.
Output / Signal*		2kVd.c.

* Signal = Alarm + Inhibit

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 standars	**Input**	**Output**	**Remarks**
EN55011/EN55022 (0.15-30MHz)	Level B	Level B	
EN55011/EN55022 (30-1000MHz)	Level B		Enclosure test
Immunity standards	**IEC/EN61000-6-2**		
EN/IEC61000-4-2	8 kV/15 kV		Contact / air, Enclosure test
EN/IEC61000-4-3	20 V/m AM-Modulated		Output ripple can increase to 0.5% of Vout Enclosure test
EN/IEC61000-4-3	20 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[1], 220[1]	1kV / 2 kV	0.5kV / 1 kV	
EN/IEC61000-4-6	10 V_{RMS}	10 V_{RMS}	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/htm/download.html
Specifications subject to change without notice.

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