

AP246

2 Outputs

19" Power Supply, 60 Watt



- High efficiency: 84%
- ACin wide range: 85...265V AC
- DCin wide range: 95...300V DC
- 8 HP plug in width
- H15 standard pinout
- Full power rail sharing
- Meets EMC standards
EN 50081-1 (EN 55022/B), EN 50082-2
EN 61000-4, VDE 0160/2 and NAMUR



Power Supply AP246

This dual-output power supply uses a two-step wide-range converter. It works over a wide range (100 - 240V AC) without any switch over.

Hold-up time is up to 250ms at 230V AC. Load distribution is flexible; there is no minimum load and the full power of 60W can be delivered from any one output.

EMC compatibility is a major feature. It has low spurious noise, and noise suppression meets EN 55022 class B. Noise immunity meets and VDE 0106 class 2, even at full load.

Over-voltage and over-temperature protection avoid problems even in extreme working environments.

Vout [DC]	Iout a/b *	Pout	Features	Order-No.
Vout1 +12V	3A / 5A	60W	Wide input range, OTP, OVP	AP246.111
2 -12V	3A / 5A	60W		
Max. total power:		60W		
Vout1 +15V	2.5A / 4A	60W	Wide input range, OTP, OVP, readjusted	AP246.122
2 -15V	2.5A / 4A	60W		
Max. total power:		60W		

"F" appended to Order No. means front panel 8 HP included and fitted.

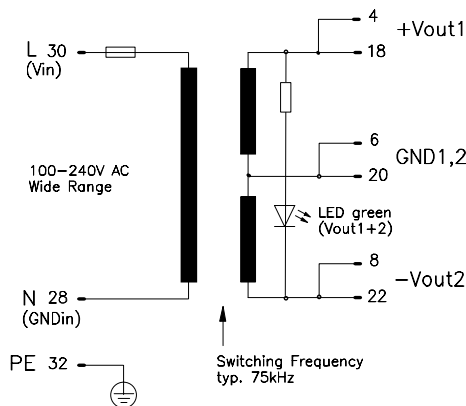
* Iout a: Current range with increased accuracy.

* Iout b: maximum output current.

Accessories: H15 connector, 6.3mm flat contacts: ZP100
H15 connector with soldering pins: ZP120

Warranty: 2 years from date of delivery.

Schematic:



Output

Sum voltage	Vout1+2		Fixed.
Accuracy	Vout1	max. \approx 0.5%	Includes production-adjustment without load.
	Vout2	max. \pm 0.5%	
Sense lines		None	Not available.
Minimum load		None	Not necessary.
Output power Pout		max. 60W	Total power. Each.
	Pout1,2	max. 60W	
Noise, Ripple incl. spikes		max. 3.5 / 4.0mVpp	20Hz...200kHz, Iout a/b. 20Hz...20MHz, Iout a/b.
		max. 4.5 / 6.0mVpp	
Over-voltage protection		typ. 1.15 x Vout	Threshold accuracy \pm 3,5%.
Derating		1.5W/K	+55° to +70°C Ta.
Operating indicator		1 green LED	On the front, sum voltage Vout1+2.
Isolation Vout to Vin		SELV	EN 60 950, VDE 0805.

All outputs are protected against open-circuit, short-circuit, and overload.

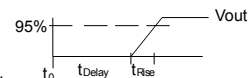
- Mechanical: 8HP / 3U board (DIN 41494), Al/Mg alloy cover for component side, plastic cover for bottom side, LxWxH = 171.93 x 40.64 x 110mm (100mm), the length includes the connector, see page 4.
- Weight: App. 550g
- Connector: H15 (DIN 41612), coding option, max. load per pin 11A @ 70° C.

Input

Line input AC	100...240V AC	Wide-range converter.
• Range	85...265V AC	Full spec.
Line input DC	275V DC	Wide-range converter.
• Range	95...300V DC	Full spec.
Line frequency	47...63Hz	DC or 400Hz, see page 2.
Input current rms	max. 1.5A	@ 85V AC.
Noise suppression	EN 55 022/B	10kHz...30MHz, conducted.

Specifications are valid at 230V AC, unless otherwise stated. They are subject to change without prior notice.

Output (continued)				AP246.111	AP246.122	
Voltage regulation						
· Line regulation		max.	%	± 0.1	± 0.1	85...265V AC, I _{out} = 100%.
· Load regulation stat.	ΔU_{stat}	max.	%	± 2.5 / 3.5	± 0.3 / 0.4	I _{out1} full load...I _{out2} full load and reverse, I _{out} a/b, for other power rail sharing see graph on page 3.
· Load regulation dyn.	ΔU_{dyn}	max.	%	± 1 / 1	± 1 / 1.5	10%...90%...10% load change, I _{out} a/b, rise time dt = typ. 20µs.
Response time	t_s	max.	ms	3	3	Till ΔV_{out} is within < 0.5% of final value.
· Temperature coefficient		typ.	%/K	± 0.01	± 0.01	
Ripple						
· incl. spikes		max.	mVpp	5 / 8	3.5 / 4	20Hz...200kHz, @AC nom., I _{out} = 100%, I _{out} a/b.
		max.	mVpp	6 / 10	4.5 / 6	20Hz...20MHz, @AC nom., I _{out} = 100%, I _{out} a/b.
Current limitation						
· Threshold		typ.	W	66	66	Fixed, total power.
· Short-circuit		max.	A	1.4 x I _{out} b	1.4 x I _{out} b	Switch off with periodic restart.
Start delay	t_{Delay}	typ.	ms	400	400	After switch on.
V _{out} rise up time	t_{Rise}	typ.	ms	30	30	
On and off characteristic						Approximately monotonic.
Power back immunity	U_{back}	max.	V	1.1 x V _{out}	1.1 x V _{out}	Sum voltage, unit off/on.
Load capacity		max.	µF	2 x 5,000	2 x 5,000	Do not exceed for safe start up.

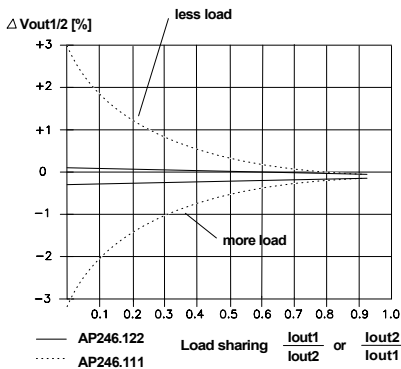


Input (continued)						
AC input range			V AC	85...265		Full spec.
DC input range			V DC	95...300		Full spec.
Derated AC range			V AC	75...85, 300 for 0.5s		
Derated DC range			V DC	300...370		Full spec, but air- and leakage distances not longer than stated in VDE 0805.
Frequency range			Hz	47...63		Full spec.
Derated frequency range			Hz	63...400		Increased leakage currents.
In-rush current		max.	A	20		Wait min. 30s before switching on again (cold-start).
Hold-up time		min.	ms	250		@230V AC, I _{out} = 100%, see graph on page 3.
		min.	ms	40		@110V AC, I _{out} = 100%, see graph on page 3.
		min.	ms	25		@90V AC, I _{out} = 100%, see graph on page 3.
Power factor	λ	typ.		0.65		@98V AC, I _{out} = 100%.
Internal fuse				5x20mm T3.15A/250V		In the L line, as per IEC 127/2-5. To replace, see page 4.
Input range selection				Wide range		

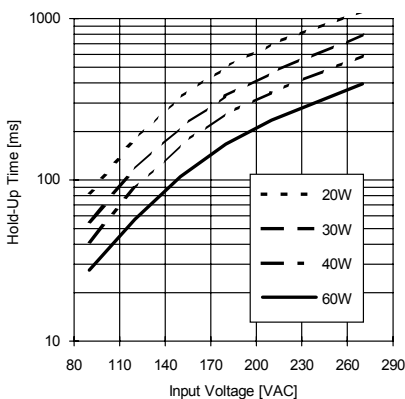
Electromagnetic Compatibility

Emissions according to EN 50081-1				Class B		EN 50081-2 is also satisfied
· Radio interference, EN 55011, EN 55022						Conducted 10kHz...30MHz.
Immunity according to 50082-2						EN 50082-1 is also satisfied
· Electrostatic discharge ESD, EN 61000-4-2				8kV direct discharge (level 4)		
				15kV air discharge (level 4)		
· Radiated fields, EN 61000-4-3				10V/m (level 3)		To ACin, V _{out} and signal lines: length = 1m.
· Fast transients, EN 61000-4-4				4kV (level 4)		Coupled to ACin line.
				2kV (level 3)		Coupled to DCout line.
				2kV (level 4) cap. coupling		Coupled to V _{out} and signal lines.
· Surge transients, EN 61000-4-5				4kV (isolation class 4)		Common mode, unit on.
				2kV (isolation class 4)		Differential mode, unit on.
· Transient voltage, IEC 255				5kV		Common mode, unit off.
· NAMUR-prescription				Satisfied		
· Transient resistance, VDE 0160 §5.3.1.1.2				750V / 1.3ms (class 2)		Valid for total load range.
· Over-voltage resistance (PULS standard)				300V AC / 0.5s		

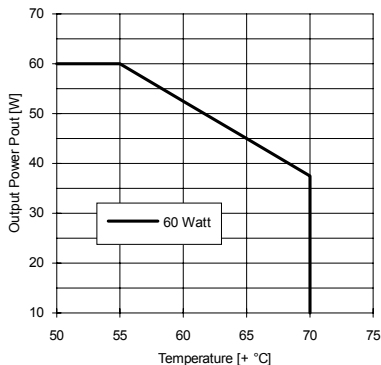
Typ. Voltage Deviation at Full Load



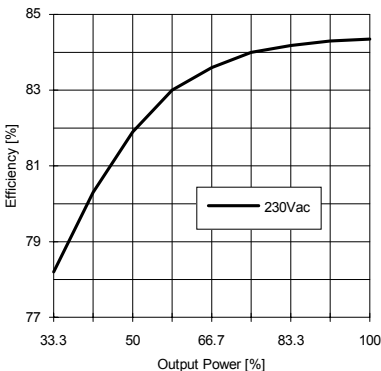
Min. Hold-Up Time



Typ. Derating over Temperature



Typ. Efficiency



Protection

Unit protection

· Overload	Yes	Total-power limit.
· Short-circuit proof	Yes	Auto restart after 400ms.
· Open-circuit proof	Yes	
· Over-temp. (OTP) on heatsink	typ. +100° C	Switch off.
· Reverse battery prot.	typ. +98° C	Switch on (automatically).
· ACin range selection	Yes	
	Wide range	

Load protection

· Over-voltage (OVP) Threshold	Yes	Switch off.
	typ. 28.6V (Vout1+2)	AP246.111.
	typ. 34.4V (Vout1+2)	AP246.122.
Accuracy	max. ± 3.5%	
Restart Method	After line disconnection, wait time 1 min.	
	Switch off with self-holding.	

Safety

Electrical safety

· Test voltage (each unit) according to EN 60 950 for t = 2sec	3kV AC 2.5kV AC 500V AC	Primary / secondary. Primary / PE. Secondary / PE.
· Air- and leakage distance	6.4 / 8mm 4mm	Primary / secondary. Primary / PE.
· Isolation resistance	min. 50M	VDE 0551.
· Protection class	I	VDE 0106 part 1, IEC 536 .
· PE resistance	< 0.Ω	VDE 0805.
· Protection system	IP20	DIN 40050, IEC 529.
· Leakage current	max. 0.1mA	EN 60 950 (47...63Hz line) .
· Safe low voltage	SELV	EN 60 950, VDE 0805, VDE 0160.
· Over-voltage class	II	VDE 0110 part 1, IEC 664.

Touch safety

· Penetration protection	Finger test > Ø 3mm	VDE 0100 §6, EN 60 950, VBG4. e.g. screws, small parts etc.
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Operation and Ambient Area

Application class	KSF	DIN 40040.
Operation temperature	max. ° 0. +70°C	Ta (measured at 1cm distance).
· Derating range	+55... +70°C	Derating, see diagram.
Storage temperature	typ. -20.. +100°C	Ta.
Humidity	max. 95%	Non-condensing.
Mechanical usage	Vertical	See page 4.
· Lateral spacing	None	No gap needed.
Cooling	Normal convection	Don't obstruct air flow.
Dirt protection level	max. 2	VDE 0110 part 1.
Vibration	0.075mm	IEC 68-2-6 (10...60Hz).
Shock	11ms / 15g	IEC 68-2-27 (3 shocks).
Operation Height	max. 2,000m	Above sea level.

Efficiency and Power Loss

AP246.111 and .121	typ. 84% / 11.4W	@ 230V ACin, Iout = 100%.
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Reliability and Lifetime

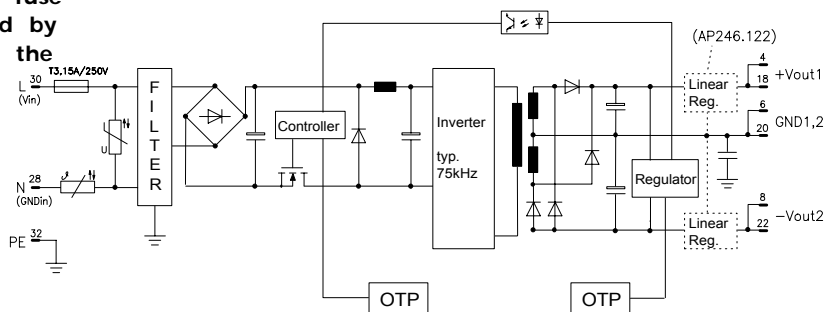
MTBF according to Siemens standard SN29500	typ. 310,000h	230VAC, Iout = 100%, +40 Ta.
Only long life (>2,000h @ 105° C) electrolytic capacitors are used.		
Function test	100%	Test certificate enclosed.
In-circuit test	Yes	
Run-in (burn-in)	24h	Full load, Ta = +55° on/off cycle.

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Fuse

The PSU has electronic protection against external short-circuits. In case of an internal defect, a fuse disconnects the unit. It can only be replaced by opening the unit which should be done by the supplier.

Schematic



Installation for Operating

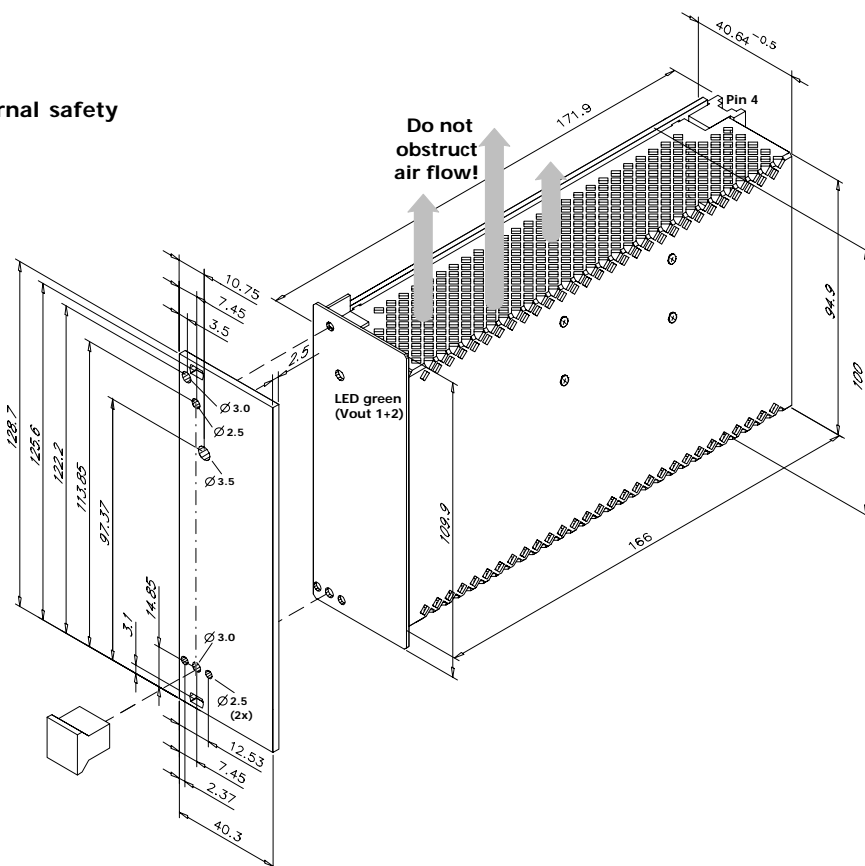
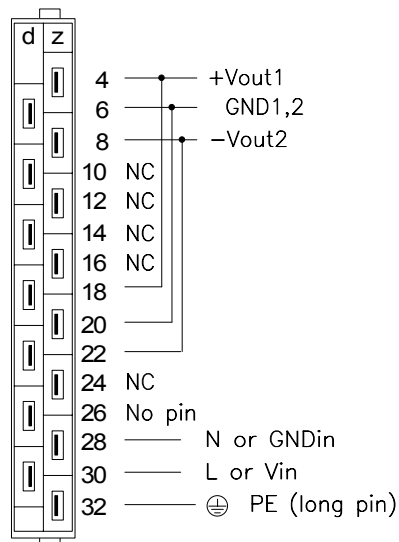
The unit is constructed for 19" systems:
 Ensure that pin 4 of H15 connector is on top. For other installation considerations consult your representative. Ensure free air flow!

Dimensions and Connections

19" board, with Al/Mg alloy cover on component side, and a plastic cover on the bottom side. 8HP plug in width. See figure below for dimensions.

Caution:

Do not remove any screws on box, as internal safety connections could be disconnected!



H15 pinout (DIN 41312)
 NC = No Connection - Do not use!

Modifications (contact supplier)

With PF-Signal.
 AP246.111 also readjusted.
 Lower cost versions.

Accessory ZP510

Installation set for mounting on DIN rail.