

# AP336.122

## 3 Outputs

### 19" Power Supply, 55 Watt



- High efficiency: 79%
- ACin wide range: 88...265V AC  
DCin wide range: 105...300V DC
- 8 HP plug in width
- H15 standard pinout
- Power rail sharing
- Meets EMC standards  
EN 50081-1 (EN 55022/B), EN 50082-2,  
EN 61000-4, VDE 0160/2 and NAMUR



EN 60 950



## Power Supply AP336.122

This triple-output power supply is optimized for high-quality analogue applications (1A @ +15V, 0,4A @ 15V). The power unit uses a bridge-mode wide-range converter. It operates with high efficiency over the total input and output range. It operates over a wide range (100 - 240V AC) without switch over. Hold-up time is over 200ms at 230V AC.

Load distribution is flexible and there is no minimum load.

EMC compatibility is a major feature. It has low spurious noise, and noise suppression meets VDE 0871 class B. Noise immunity meets EN 61000-4 and VDE 0160 class 1, even at full load. Over-voltage and over-temperature protection avoid problems even in extreme working environments

Vout [DC]	Iout	Pout	Features	Order-No.
Vout1 5.15V	7A	36W	Wide input range, PF, OTP, OVP	AP336.122
2 +15V	2.5A	37.5W		
3 -15V	1A	15W		
Max. total power:		55W		

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

Accessories: H15 connector, 6.3mm flat contacts: ZP100

H15 connector with soldering pins: ZP120

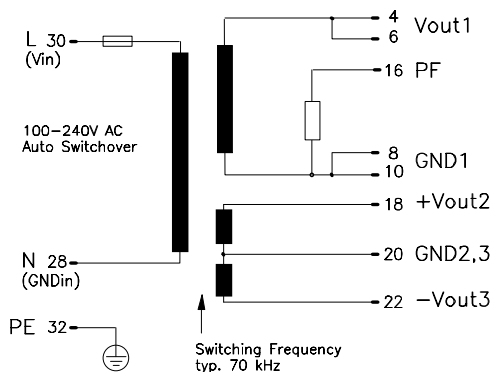
Warranty: 2 years from date of delivery.

### Output

Voltage Vout1,2,3		Fixed.
Accuracy Vout1	max ± 0.5%	Tuning tolerance.
Vout2	+1.2% / -2%	
Vout3	max. ± 2%	@ Iout3 = 0.5A.
Sense lines	None	Not available.
Minimum load	None	Not necessary, regulation details see page 2.
Output power Pout	max. 55W	Total power.
Noise, Ripple Vout1	max. 20mVpp	20Hz...200kHz.
Vout2/3	max. 10mVpp	20Hz...200kHz.
including spikes Vout1	max. 20mVpp	20Hz...20MHz.
Vout2/3	max. 10mVpp	20Hz...20MHz.
Over-voltage protection	typ. 6.2V (Vout1)	Threshold accuracy
Derating	1.5W/K	+55 to +70°C Ta.
Operating indicator	1 green LED	On the front, Vout1.
Isolation Vout to Vin	SELV	EN 60 950, VDE 0805 .
Vout1 to Vout2/3	max. 500V AC	

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

Schematic:



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 (100), the length includes the connector, see page 4.

Weight: App. 430g

Connector: H15 (DIN 41612), coding option, max. load per pin 11A @ 70° C.

### Input

Line input AC	100...240V AC	Wide-range converter.
• Range	88...265V AC	Full spec.
Line input DC	275V DC	Wide-range converter.
• Range	105...300V DC	Full spec.
Line frequency	47...63Hz	DC or 400Hz, see page 2.
Input current rms	max. 1.5A	@ 88V AC.
Noise suppression	EN 55 022/B	10kHz...30MHz, conducted.

# AP336.122 · 3 Outputs · 19" Power Supply · 55 Watt

Output (continued)				5,15V	+15V	-15V	
Voltage regulation:							
· Line regulation		max.	%	0.1	1	0.4	88...265V AC.
· Load regulation stat.	$\Delta U_{stat}$	max.	%	+0.5/-0.7	+1.2/-2	$\pm 4$	Open-circuit to full load, Iout2 only valid @ Iout1 $\geq$ 0.7A and Vin = 230V AC.
· Load regulation dyn.	$\Delta U_{dyn}$	max.	%	$\pm 7$	$\pm 1.7$	$\pm 0.5$	10%...90%...10% Load change, Iout2/3 only valid at Iout1 $\geq$ 0.7 and Vin = 230V AC.
Response time	$t_s$	max.	ms	5			Till Vout is within tolerance.
· Temperature coefficient		typ.	%/K	$\pm 0.015$			
Ripple		max.	mVpp	20	10	10	20Hz...200kHz, ACnom, @ Iout = 100%.
· incl. spikes		max.	mVpp	20	10	10	20Hz...20MHz, ACnom, @ Iout = 100%.
Current limitation							
· Threshold		typ.	W	65			Fixed, total power.
· Short-circuit		max.	A	25	8	2.2	No foldback till Vout1=3V, below that periodic restarts.
Start delay	$t_{Delay}$	typ.	s	1.2			After switch on.
On and off characteristic				No overshoot			Approximately monotonic.
Load capacity		max.	$\mu$ F	10,000	2,200	2,200	Do not exceed for safe start up.

## Input (continued)

AC input range		V AC		88...265			Full spec.
DC input range		V DC		105...300			Full spec.
Derated DC range		V DC		75...105			Different values for hold-up time, input current, ripple, Pout; for details contact supplier (no start below 105V).
		V DC		300...380			Full working, but air- and leakage distances not longer than according to VDE 0805.
Frequency range		Hz		47...63			Full spec.
Derated frequency range		Hz		63...400			Increased leakage currents.
Inrush current		max.	A	20			Wait min. 30s before switching on again (cold-start). NAMUR standard met (Ta = +25° C).
Hold-up time		min.	ms	200			@230V AC, Iout = 100%, see figure page 3.
		min.	ms	15			@88V AC, Iout = 100%, see figure page 3.
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			

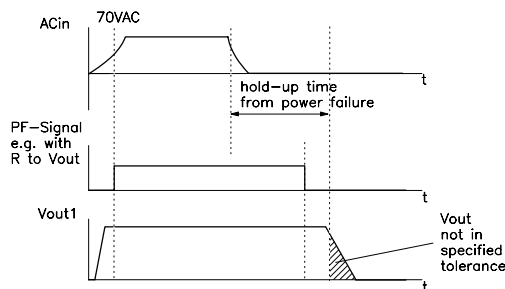
## Logic Functions

Power Fail signal PF				Power fail			Open-collector signal (U <sub>max</sub> = 30V, I <sub>max</sub> = 5mA).
· PF high, if				ACin > 70V AC			Open-collector.
Hold-up time							
· from power failure to PF-signal		min.	ms	200			@ 230V ACin.
		min.	ms	30			@ 110V ACin.
		min.	ms	10			@ 88V ACin.
· from PF-signal		min.	ms	5			Iout1 = 100%, Vout1 $\geq$ 4.75V.

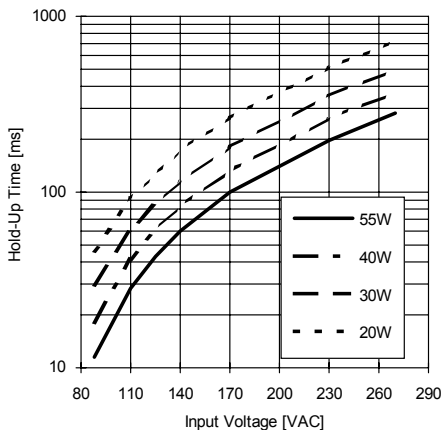
## Electromagnetic Compatibility

Emissions according to EN 50081-1							EN 50081-2 is also satisfied
· Radio interference, EN 55011, EN 55022				Class B			Conducted 10kHz...30MHz.
Immunity according to EN 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, Vout 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 Vout 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 / 0.3ms (class 1)			Valid for total load range.
· Over-voltage resistance (PULS standard)				300V AC / 0.5s			

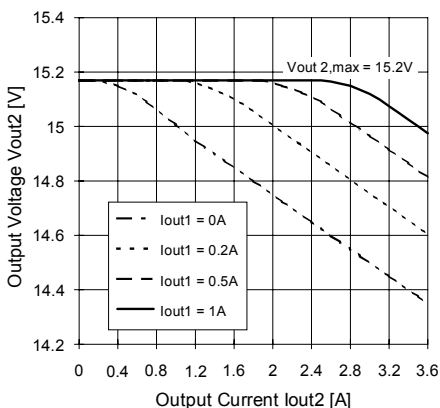
## PF-Signal and Hold-Up Time



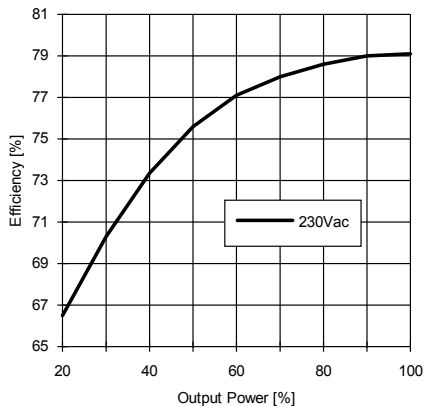
## Min. Hold-Up Time



## Output Characteristics



## Typ. Efficiency



## Protection

### Unit protection

· Overload	Yes	Total-power limit.
· Short-circuit proof	Yes	Unlimited.
· Open-circuit proof	Yes	
· Over-temperature (OTP) typ. (+90° C (internal temperature) typ. +88° C)		Switch off.
· Reverse battery prot.	Yes	Switch on.
· ACin range selection	Wide range	

### Load Protection

· Over-voltage (OVP) Threshold	Yes	Switch off.
Accuracy	typ. 6.2V	
Restart	max. ± 8%	Periodic.

## 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 $\Omega$	VDE 0551.
· Protection class	I	VDE 0106 part 1, IEC 536.
· PE resistance	< 0.1 $\Omega$	VDE 0805.
· Protection system	IP20	DIN 40050, IEC 529.
· Leakage current	max. 0.2mA	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 > $\varnothing$ 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.
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. 2000m	Above sea level.

## Efficiency and Power Loss

AP336.122	typ. 79% / 15W	@230V ACin, Pout = 100%.
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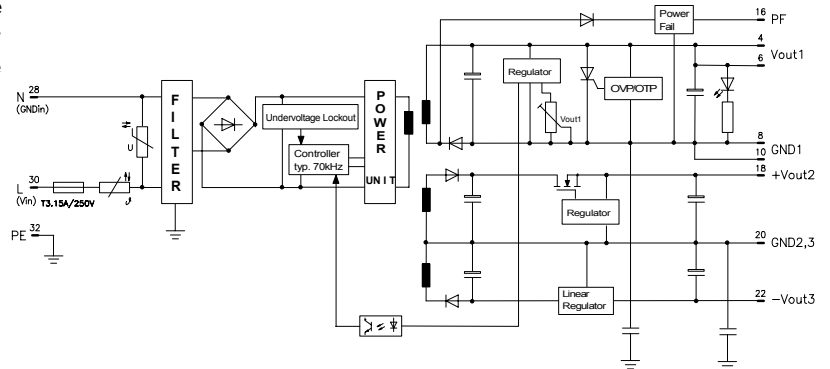
## Reliability and Lifetime

MTBF according to Siemens standard SN29500	typ. 270,000h	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°C/off cycle.

**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**

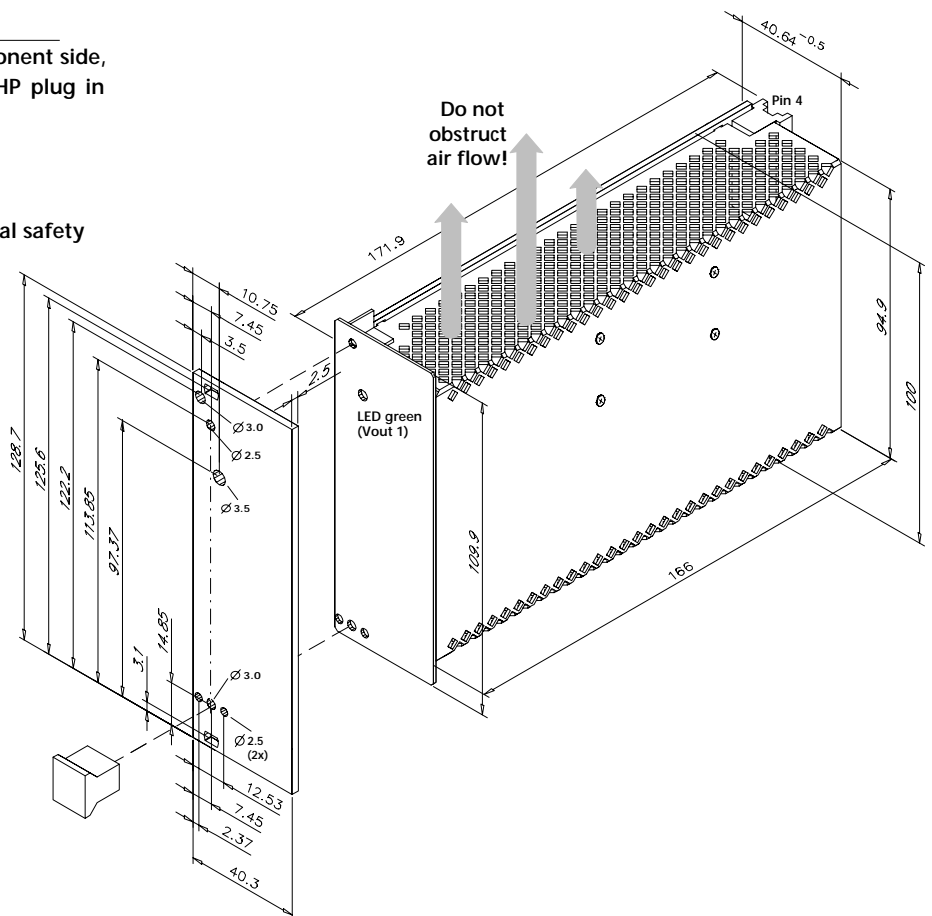
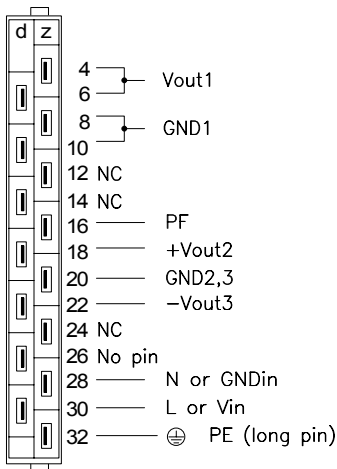
The unit is constructed for 19" systems: Ensure that pin 4 of H15 connector is on top. For other installation considerations consult your representative. Ensure free air flow.

**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.

**Caution:**

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



H15 pinout (DIN 41612)

NC = No Connection - Do not use!

**Modifications (contact supplier)**

Lower cost versions.

**Accessory ZP510**

Installation set for mounting on DIN rail.