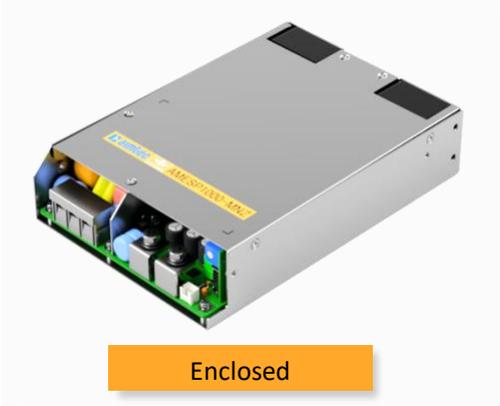


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## AMESP1000-MNZ



Enclosed

The AMESP1000-MNZ is Aimtec's highest power AC/DC converter that offers much greater cost effectiveness due to material normalization and production automation also leading to improved reliability and performance. Offering a commercial input voltage range of 90-264VAC(120-370VDC) and an output voltage range from 12-54VDC, this series will offer many benefits to your new system design.

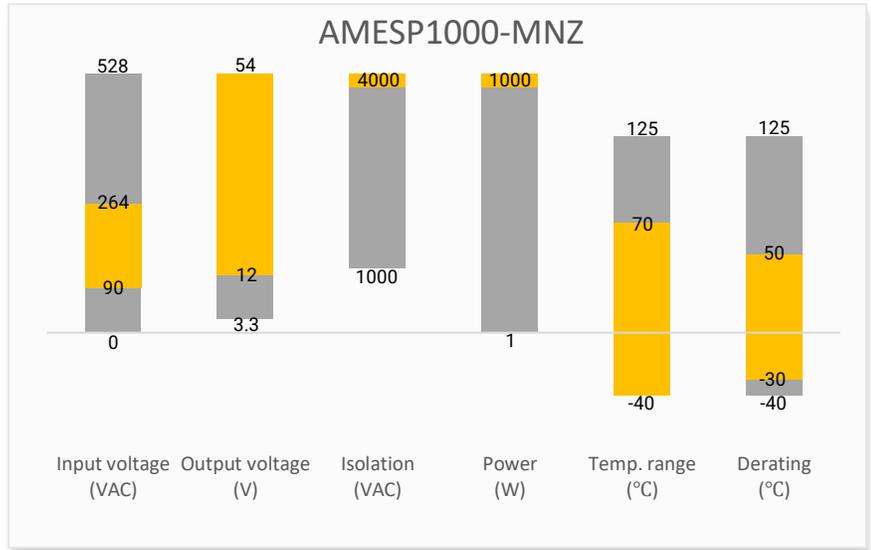
This new series offers great operating temperatures, from -30°C to 50°C with full power and also features an isolation of 4000VAC for improved reliability and system safety. Furthermore, a high MTBF of 250,000h, output short circuit protection (OSCP), output over-current protection (OCP), output over-voltage protection (OVP) and over-temperature protection (OTP) come standard with the series.

The AMESP1000-MNZ is suitable for street lighting controls, grid power, instrumentation, industrial applications, telecom, and security applications.

## Features

- Universal Input: 90 - 264VAC/120 - 370VDC
- Operating Temp: -40 °C to +70 °C
- PFC > 0.95
- High isolation voltage: Up to 4000VAC
- Low ripple & noise, 200mV(p-p) typ.
- Output short circuit, over-current, over-voltage and over temperature protection
- Regulated Output
- The base plate with conformal coating
- Active power factor correction
- Meets 2xMOPP

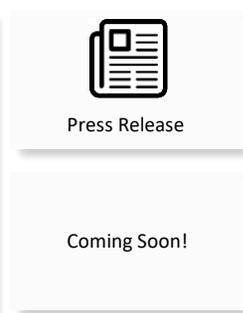
## Summary



## Training



Product Training Video  
(click to open)



Application Notes

## Applications



Power Grid



Industrial



Telecom



Instrumentation

## Models & Specifications

Single Output								
Model	Input Voltage (VAC/Hz)	Input Voltage (VDC)	Max Output Wattage (W)	Output Voltage (V)	Output Voltage Adjustable Range (V)	Output Current max (A)	Maximum capacitive load ( $\mu$ F)	Efficiency @230VAC (%)
AMESP1000-12SMNZ	90-264/47-63	120-370	960	12	12-14.4	80	40000	92
AMESP1000-15SMNZ	90-264/47-63	120-370	960	15	15-18	64	20000	92
AMESP1000-24SMNZ	90-264/47-63	120-370	1008	24	24-28.8	42	10000	94
AMESP1000-27SMNZ	90-264/47-63	120-370	1007	27	27-32.4	37.3	8000	94
AMESP1000-36SMNZ	90-264/47-63	120-370	1008	36	36-43.2	28.8	6000	94
AMESP1000-48SMNZ	90-264/47-63	120-370	1008	48	48-56	21	4000	94
AMESP1000-54SMNZ	90-264/47-63	120-370	1009	54	54-58	18.7	3000	94

\*Add suffix "-Q" for optional conformal coating (ex. AMESP1000-12SMNZ-Q is conformal coating version).

Input Specifications				
Parameters	Conditions	Typical	Maximum	Units
Input current	115VAC		12	A
	230VAC		6	A
Inrush current	115VAC, cold start	20		A
	230VAC, cold start	40		A
Power factor	115VAC, Full load	$\geq 0.99$		--
	230VAC, Full load	$\geq 0.95$		--
Leakage current	240VAC		0.5	mA

Output Specifications				
Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	Full load, main output	$\pm 1$		%
	Full load, auxiliary 5V output	$\pm 2$		%
Line regulation	Full load, main output	$\pm 0.5$		%
	Full load, auxiliary 5V output	$\pm 1$		%
Load regulation	Full load, main output	$\pm 0.5$		%
	Full load, auxiliary 5V output	$\pm 1$		%
Ripple & Noise*	15V/27V main output	150		mV <sub>p-p</sub>
	Others main output	200		mV <sub>p-p</sub>
	Auxiliary 5V output	100		mV <sub>p-p</sub>
Start up time	230VAC, full load		3	S
Hold up time	Full load, 115VAC/230VAC	12		ms
Dynamic minimum load		10		%
Minimum load		0		%
5V auxiliary DC output	Output voltage	5		V
	Output current		2	A
	Maximum capacitive load		1000	$\mu$ F

\* Ripple and Noise are measured at 20MHz bandwidth with a 47 $\mu$ F electrolytic capacitor and a 0.1 $\mu$ F ceramic capacitor. Please refer to the application note for specific details.

Isolation Specifications				
Parameters	Conditions	Typical	Rated	Units
Tested I/O voltage	60 sec, leakage current < 10mA, 2xMOPP		4000	VAC
Tested Input to GND voltage	60 sec, leakage current < 10mA, 1xMOPP		2000	VAC
Tested Output to GND voltage	60 sec, leakage current < 10mA, 1xMOPP		1500	VAC
Resistance (I/O, I/O to GND) *	500VDC		> 100	MΩ
Means of protection I/O			2xMOPP	
Means of protection I/PE			1xMOPP	
Means of protection O/PE			1xMOPP	

\* Tested under 25±5°C ambient temperature with relative humidity <95% and no condensation.

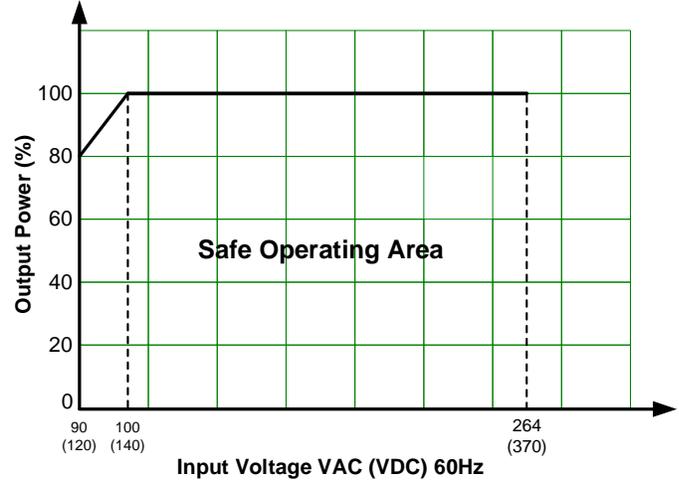
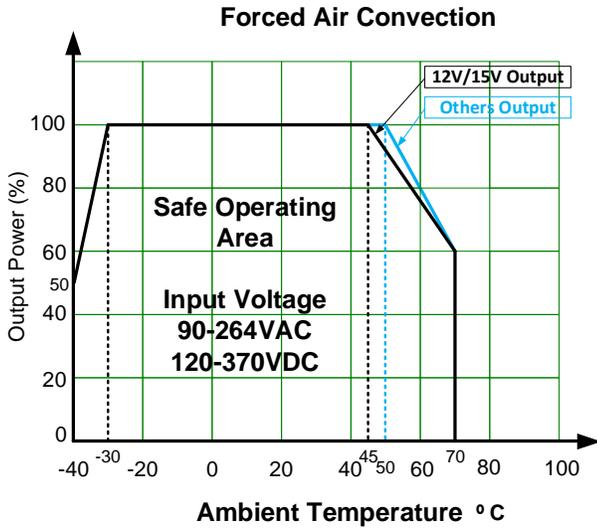
General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Safety class	Class I			
Switching frequency	PFC circuit	65		KHz
	LLC circuit	100		KHz
Over Current protection	Auto recovery	≥ 110		% of Iout
Over voltage protection	Hiccup, Continuous, Auto recovery, auxiliary 5V output		7	VDC
	PS_ON signal control or manual recovery, 12V output		16.5	VDC
	PS_ON signal control or re-power on for recover, 15V output		21	VDC
	PS_ON signal control or re-power on for recover, 24V output		35	VDC
	PS_ON signal control or re-power on for recover, 27V output		35	VDC
	PS_ON signal control or re-power on for recover, 36V output		48	VDC
	PS_ON signal control or re-power on for recover, 48V output		60	VDC
	PS_ON signal control or re-power on for recover, 54V output		63	VDC
Over temperature protection*	Over-temperature protection activation		70	°C
	Over-temperature protection deactivation	50		°C
Short circuit protection	Hiccup, Continuous, Auto recovery			
Operating temperature	See derating graph	-40 to +70		°C
Storage temperature		-40 to +85		°C
Power derating	-40 °C to -30 °C	5		% / °C
	+45 °C to 70 °C, 12V/15V output	1.6		% / °C
	+50 °C to 70 °C, others	2.0		% / °C
	90VAC ~ 100VAC	2.0		% / VAC
Temperature coefficient		±0.03		% / °C
Cooling	Forced air cooling			
Humidity	Non-condensing, Storage	≥ 10	95	% RH
	Non-condensing, Operating	≥ 20	90	% RH
Altitude			5000	m
Case material	SUS 304			
Weight		1250		g
Dimensions (L x W x H)	7.48 x 5.00 x 1.59 inches (190.0 x 127.0 x 40.5mm)			
MTBF	≥ 250 000 hrs (MIL-HDBK -217F, t=+25°C)			

\*Tested under full-load condition.  
\*\* The fan speed is determined by the ambient temperature and output power and linearly adjusted.  
Note: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications		
Parameters		
Agency approvals	EN/BS EN 62368-1	
Standards	Information technology Equipment	Design to meet IEC/UL 62368-1, GB4943.1, IEC 60601-1, IS 13252, ES/EN 60601-1-2:2015 Edition 4
	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B
	Harmonic current	EN 61000-3-2, class A
	Voltage flicker	IEC/EN 61000-3-3
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2 Contact $\pm 8\text{KV}$ / Air $\pm 15\text{KV}$ , Criteria A
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4 $\pm 2\text{KV}$ , Criteria A
	Surge Immunity	IEC/EN 61000-4-5 L-L $\pm 2\text{KV}$ /L-G $\pm 4\text{KV}$ , Criteria A
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6 10Vr.m.s, Criteria A
	Voltage dips, Short Interruptions Immunity	IEC/EN 61000-4-11 0%, 70%, Criteria B
<p>Note: The power supply should be considered as a part of the components in the system. RE performance are been tested on a metal plate with a thickness of 3mm and a length of 450mm <math>\times</math> 450mm. The power supply must be combined with the terminal equipment for electromagnetic compatibility confirmation.</p>		

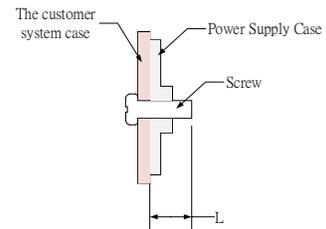
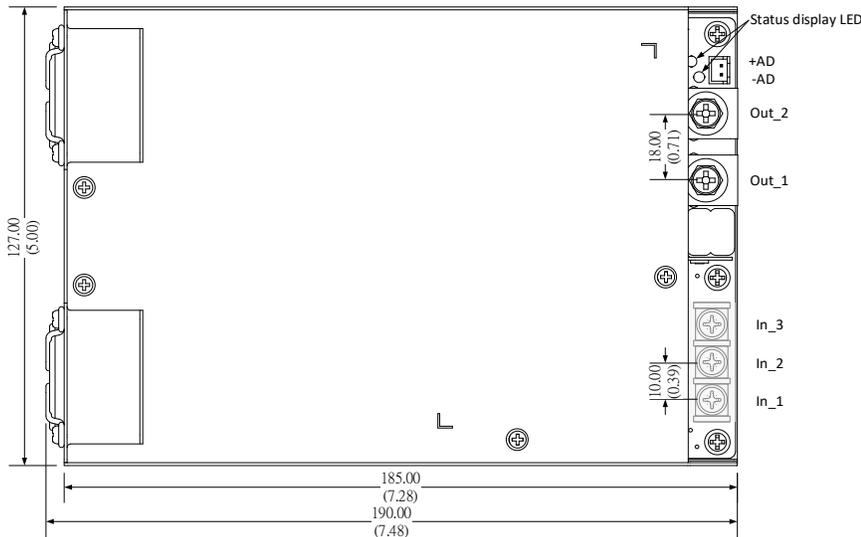
Functional Specifications				
Parameters	Conditions	Typical	Rated	Units
Remote control	Full input voltage and load range, Power ON	PS_ON (Pin6) and GND (Pin7/14) are short		
	Full input voltage and load range, Power OFF	PS_ON (Pin6) and GND (Pin7/14) are open		
Remote Sense	Total compensate voltage (Vs+/Vs-shorted to Vo+/VO-respectively)	200		mV
DC_OK signal	Full input voltage and load range, Power ON	> 2.5	5	VDC
	Full input voltage and load range, Power OFF		0.5	VDC
ORing	Support direct parallel use, achieve 3+1 parallel redundancy			
Current sharing accuracy	When units in parallel, each power supply needs to carry a rated load of more than 50%	$\pm 5$		%
LED signal	Main output status indication, Normal output	Green LED ON		
	Main output status indication, Abnormal output, Protected	Red LED ON		
	Main output status indication, Power OFF (AC without input)	LED light OFF		
SDA, SCL for I2C	Internal 2.4 k $\Omega$ pull-up resistor to internal 3.3 V			
<p>Note: If the product is used in medical equipment, the terminal system should shield the LED signal light to meet the medical certification requirements that operators should not see the indicator light after the product is installed.</p>				

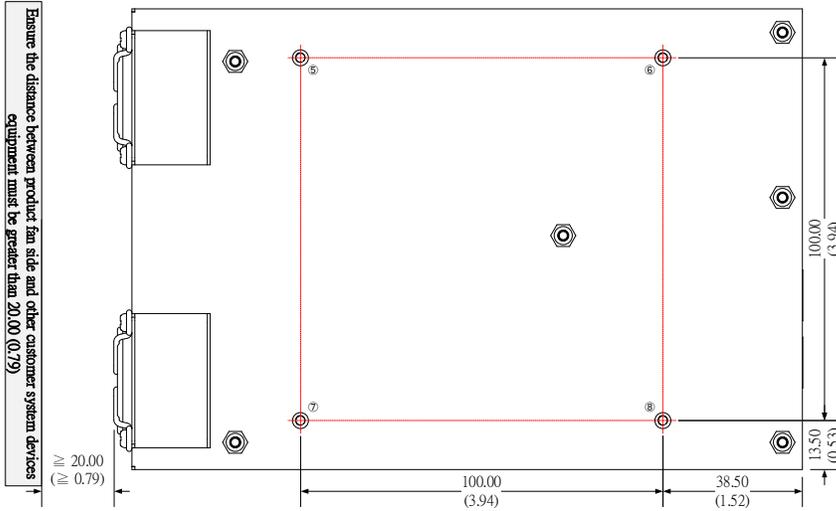
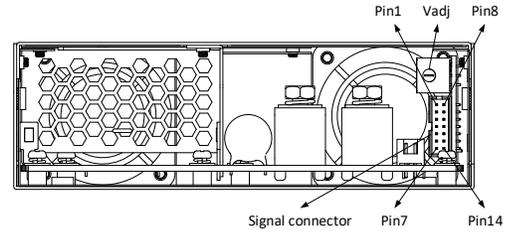
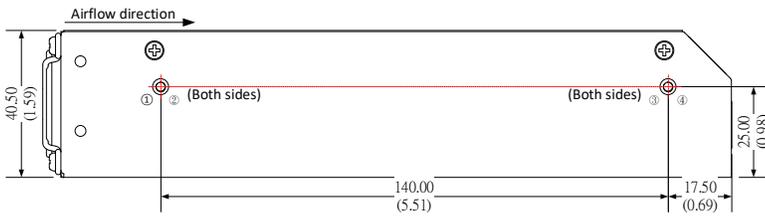
**Derating**



Note: With an AC input voltage between 90-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves.

**Dimensions**





Note:  
Unit: mm(inch)  
Input wire gauge: 22-12AWG  
Input screw terminal tightening torque: M4, 1.2N-m(Max)  
Output screw terminal tightening torque: M5, 2.3N-m(Max)  
Mounting screw tightening torque: M3, 3mm(Max), 0.8N-m(Max)  
General tolerance:  $\pm 1.0(\pm 0.04)$   
At least one of the ① - ⑧ location must be connected to PE

Pin Output Specifications	
Pin	Function
In1	AC Input (L)
In2	AC Input (N)
In3	GND
Out_1	-V Output
Out_2	+V Output

Pin Output Specifications (Auxiliary DC output)		
Pin	Function	Recommended connector
-AD	Auxiliary DC output -	Connector KANGDAO XHS2.5-SY or equivalent
+AD	Auxiliary DC output +	Terminal KANGDAO XH2.5-TE or equivalent

Pin Output Specifications (Signal connection terminal)						
Pin	Label	Function	Pin	Label	Function	Recommended connector
1	VS+	Remote compensation positive end	8	VS-	Remote compensation negative terminal	Connector JST PHDR-14VS or equivalent
2	Current share	Current sharing bus	9	ADDRESS_0	ADDRESS code 0	
3	DC_OK	DC_OK Signal	10	ADDRESS_1	ADDRESS code 1	
4	SCL	I2C communication line	11	ADDRESS_2	ADDRESS code 2	Terminal JST SPHD-002T-P0.5 or equivalent
5	SDA	I2C communication line	12	RXD	Serial communication	
6	RC	Remote Control signal	13	TXD	Serial communication	
7	GND	Signal terminal reference ground	14	GND	Signal terminal reference ground	

Note:  
1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load.

2. The ambient temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m.
3. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability.
4. The out case needs to be connected to PE of system when the terminal equipment is operating.
5. The output voltage can be adjusted by the ADJ, clockwise to decrease.
6. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. All EMC tests should be confirmed with the final equipment.
7. In the appearance dimension drawing,  $\pm V_o$  represents the main output,  $\pm S$  represents the auxiliary output, and the auxiliary output can be selected by the customer, which has no effect on the main output.

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