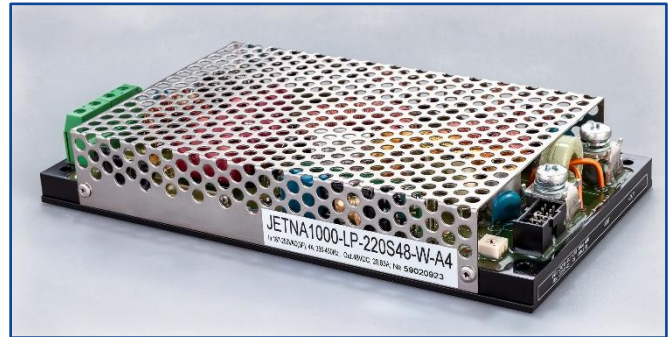


## Features

- Output power up to 1000 W, 36 W/inch<sup>3</sup>
- Operating case temperature -60 ... +95 °C
- Efficiency up to 94 %
- Case dimensions 174x92x29 (mm) - A4
- CNC milled case
- Component polymer potting protection
- Input ranges:
  - "400" - (323-440 VAC, 3ph., 50 Hz) - standard,
  - "220" - (187-253 VAC, 3ph., 400 Hz) - on request
- Remote ON (OFF)
- Active parallel operation
- Remote sense via RS pins
- Max output capacitance - unlimited
- Additional temperature sensor for operation in air-tight equipment (on request)



## Description

**JETNA-LP** series of 3-phase AC/DC isolated power supply units meant for operation in harsh environmental conditions. A combination of electro-technical and mechanical parameters creates versatility for the series to be used in various application fields: both low and high altitude in unprotected equipment compartments, in all types of transport, in supercomputers, in low and high temperature environments, digital signage equipment, in radar systems. The series is an optimal fit for any environment which requires low-profile, minimized dimensions and weight, high efficiency and wide temperature range.

## Ordering information

**JETNA 1000 - LP - 400 S 24 - W - A4**

1            2            3            4            5            6            7            8

- 1 Series name.
- 2 Nominal output power, W: default **1000 W**, other output power limits may be provided on request.
- 3 Part of series name.
- 4 Input voltage range: default **"400" 323-440 VAC, 3 ph.**; possible to provide **"220"** range on request.
- 5 Number of output channels: **"S"** - 1 channel.
- 6 Nominal output voltage of channel.
- 7 Index of case operating temperature range: **"W"** - default **-60 ... +95 °C**; other temperature ranges possible on request.
- 8 Index of case form-factor.

Base models (1 channel)					
Model part number	Input voltage	Output power	Output voltage	Output current per channel	Typical efficiency at 70 % load
<a href="#">JETNA1000-LP-400S12-W-A4</a>	323-440 VAC or DC equivalent	720 W	12 VDC	60.00 A	91 %
<a href="#">JETNA1000-LP-400S15-W-A4</a>		900 W	15 VDC	60.00 A	92 %
<a href="#">JETNA1000-LP-400S24-W-A4</a>		1000 W	24 VDC	41.67 A	93 %
<a href="#">JETNA1000-LP-400S27-W-A4</a>		1000 W	27 VDC	37.04 A	93 %
<a href="#">JETNA1000-LP-400S36-W-A4</a>		1000 W	36 VDC	27.78 A	94 %
<a href="#">JETNA1000-LP-400S48-W-A4</a>		1000 W	48 VDC	20.83 A	94 %
<a href="#">JETNA1000-LP-400S60-W-A4</a>		1000 W	60 VDC	16.67 A	94 %

**Additional ordering information:**

- 1) The units may be provided with a different range of input voltage on request, please see available ranges in our [selection guide](#).
- 2) Units with non-standard output voltage may be provided on request.
- 3) Units with non-standard output power may be provided on request.

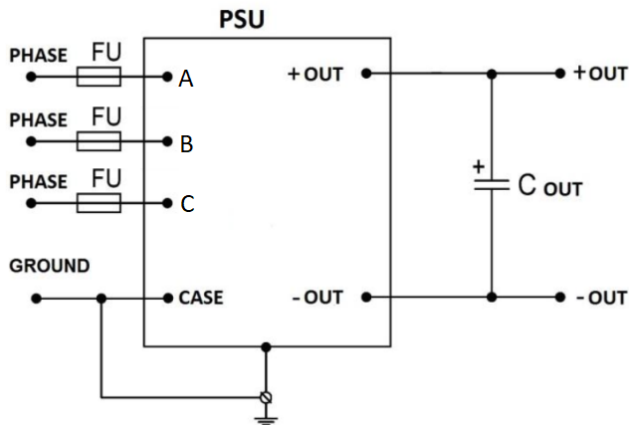
General characteristics <sup>3</sup>		
Switching frequency		100 kHz typ. (PWM modulation)
Temperature ranges	case operating temperature	-60° C ... +95° C (default "W")
	storage temperature	-60° C ... +100° C
Over-temperature protection		+95° C typ.
Thermal mode and cooling method	cooling methods, from most preferred (for the unit to be used with a coldplate or heatsink it's necessary to consult with the producer)	1. Conductive - heatsink-coldplate 2. Forced air heatsink cooler 3. Convectional heatsink cooling with vertical orientation of itself and vertical orientation of its ribs for free air flow from bottom to top
Thermal resistance	case to ambient	-
Humidity (non-condensing)		5-95 % rel. H
Insulation	in/case	1500 VAC
	in/out, in/REM	3000 VAC
	out/case, out/REM, REM/case	500 VAC
	out/out	500 VDC
Isolating resistance @ 500 VDC		>20 MOhm
Thermal shock, mechanical shock & vibration		MIL-STD-810F
Safety standards		IEC/EN 60950-1
Typical MTBF	Pout = 0.7·Pout,max	130 000 hrs (Tcase = 25° C)
Weight (max)		1100 g
Input characteristics <sup>3</sup>		
Input voltage range (with power derating)	"400", 50 Hz, 3 ph. and ground	323-440 VAC, 400 VAC nom. (or 390-620 VDC)
	"220", 400 Hz, 3 ph. and ground	187-253 VAC, 220 VAC nom. (or DC equivalent)
Start-up input voltage	for "400" input	typ. 300 VAC
EMC standard compliance <sup>1</sup>	with JETAF15-400 filter – CE 102 MIL-STD-461F	
Power Factor typ.		0.94
Output characteristics <sup>3</sup>		
Power derating based on input voltage	-	no derating
Output voltage adjustment	-20 % ... +5 % via in. trimmer ADJ or ±5 % via ADJ output (see drawing)	
Output voltage regulation <sup>2</sup>	input variance U <sub>in,min</sub> to U <sub>in,max</sub>	±0.5 % for load 10-100 %
	load variance 10 % to 100 %	±1 %
Ripple and noise (peak-to-peak)	20 MHz bandwidth	<1 % for load 10-100 %
Protection	over-current	current source behavior: current is limited at 110-125 % of I <sub>out,nom</sub>
	over-voltage	<130 % U <sub>out</sub>
Capacitive load (max)	-	<b>unlimited</b>
Remote OFF	Unit is shut down by applying 3-5VDC (2-10 mA) to +REM, -REM pins or by connecting AUX to +REM.	
Isolated aux. output	FAN pins	9.5-13 VDC, 200 mA max.
"OGOOD" function	open-collector. LOW resistance if U <sub>out</sub> > 0,7·U <sub>out,nom</sub> ; HIGH if U <sub>out</sub> < 0,7·U <sub>out,nom</sub> . U <sub>max</sub> = 20 V, I <sub>max</sub> = 15 mA	

1. See available filters on [www.aeps-group.com](http://www.aeps-group.com).

2. -

3. All specifications are valid for normal climatic conditions, nominal output voltage and current, unless stated otherwise.

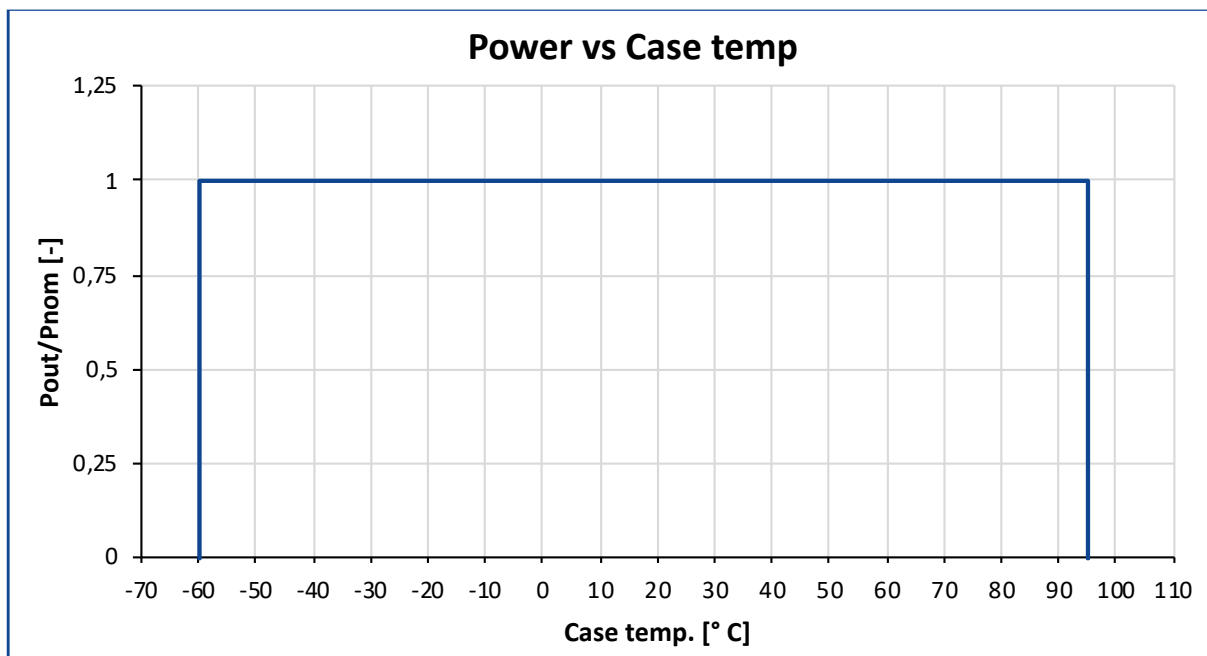
## Minimal connection scheme



In any system application it's necessary to at least use minimal connection scheme consisting of components shown on the picture.

C out – chosen in accordance with Technical Reference Manual (see on our website).

## Power-temperature relationship



## Additional application information

### 1. Value of case temperature

The case temperature is measured at the middle of the long side of the case base. When using a thermocouple, it is necessary to attach the thermocouple conductors to the base surface at a distance of at least 20 mm from thermocouples head. **The thermocouple measuring end and its conductors must be covered with a layer of heat-conducting paste 2-3 mm thick to provide correct measurements.**

### 2. Possible cooling methods

- 1) Conductive cooling with aluminum (or copper) **heatsink or coldplate, with base at least 2 mm thick.**
- 2) Forced air.
- 3) Convectional heatsink cooling with vertical orientation of itself and vertical orientation of its ribs for free air flow from bottom to top.

**To use the units without a heatsink it's necessary to consult with the producer.**

Most of the unit's dissipated heat (93-95 %) is concentrated **on the BOTTOM SIDE of the unit (fully metal surface)** which must be attached to the heatsink-coldplate or ribbed heatsink surface. Requirements for the heatsink surface (preferably CNC milled) - flatness tolerance of the heatsink surface must be lower than 0.1 mm per 100 mm of length.

### 3. Unit heatsink fixation

Mounting screws tightening order should be following: first the central screw (mandatory if available), then one pair of diagonally placed screws, then another pair of diagonally placed screws. First installation of the screws should be done without force. Then all the screws should be tightened with the recommended torque.

For quality contact between the unit and a heatsink - it's necessary to use thermal conductive paste with thickness less than 0.1 mm, with thermal conductivity **greater than 2 W/K.m**. The paste must be applied with mesh stencil in a pattern of squares (i.e. 2x2 mm to 4x4 mm squares mm with 0.5-1 mm spacing between the squares). This allows paste to be evenly spread in a thin layer and excess air to escape when tightening screws during unit mounting.

### 4. Short-term unit operation

If it's necessary to shortly turn on the unit for 3-5 minutes (for example for input-control testing), an aluminium (copper) coldplate must be used as a heatsink. Its width and length must be not less than of the unit itself, with thickness at least 12 mm. The unit must be placed on coldplate through a thin (0.15-0.3 mm) silicone-based heat-conducting sheet.

## 5. Thermal protection tripping

When internal unit's thermal protection is tripped the unit is turned off (until automatic restart) and "OGOOD" outputs state becomes high-resistance (where available). **Such state should lead to measures of forced heatsink cooling, for example via fans turn-on.** Time before automatic restart of the unit after thermal protection tripping can last from several seconds up to several minutes depending on thermal inertia of the heatsink. **For units meant to operate in airtight equipment** - on request it's possible to include **additional thermal sensor** to monitor ambient temperature of air closest to the unit's surfaces.

## 6. Operation with shorted outputs

The units have a short-circuit output protection. **The protection is for emergency only, not for long-term operation. It's prohibited to use the units with shorted outputs (the units have the special detectors inside).**

## 7. Reliability of in-parallel connected units system

To maximize reliability of in-parallel connected units system (for case of failure of one in-parallel connected units), with minus outputs (-OUT) directly connected together - plus outputs (+OUT) should be connected through separating diodes. Usually, Schottky diodes with breakdown voltage at least twice of unit's output voltage are used for such purpose. PAR outputs of all in-parallel connected units must be directly connected together.

**Only units delivered within one order are guaranteed to be properly operating while utilizing active parallel function.** Please consult with us if you'd like to set-up active parallel operation of units from different orders or batches.

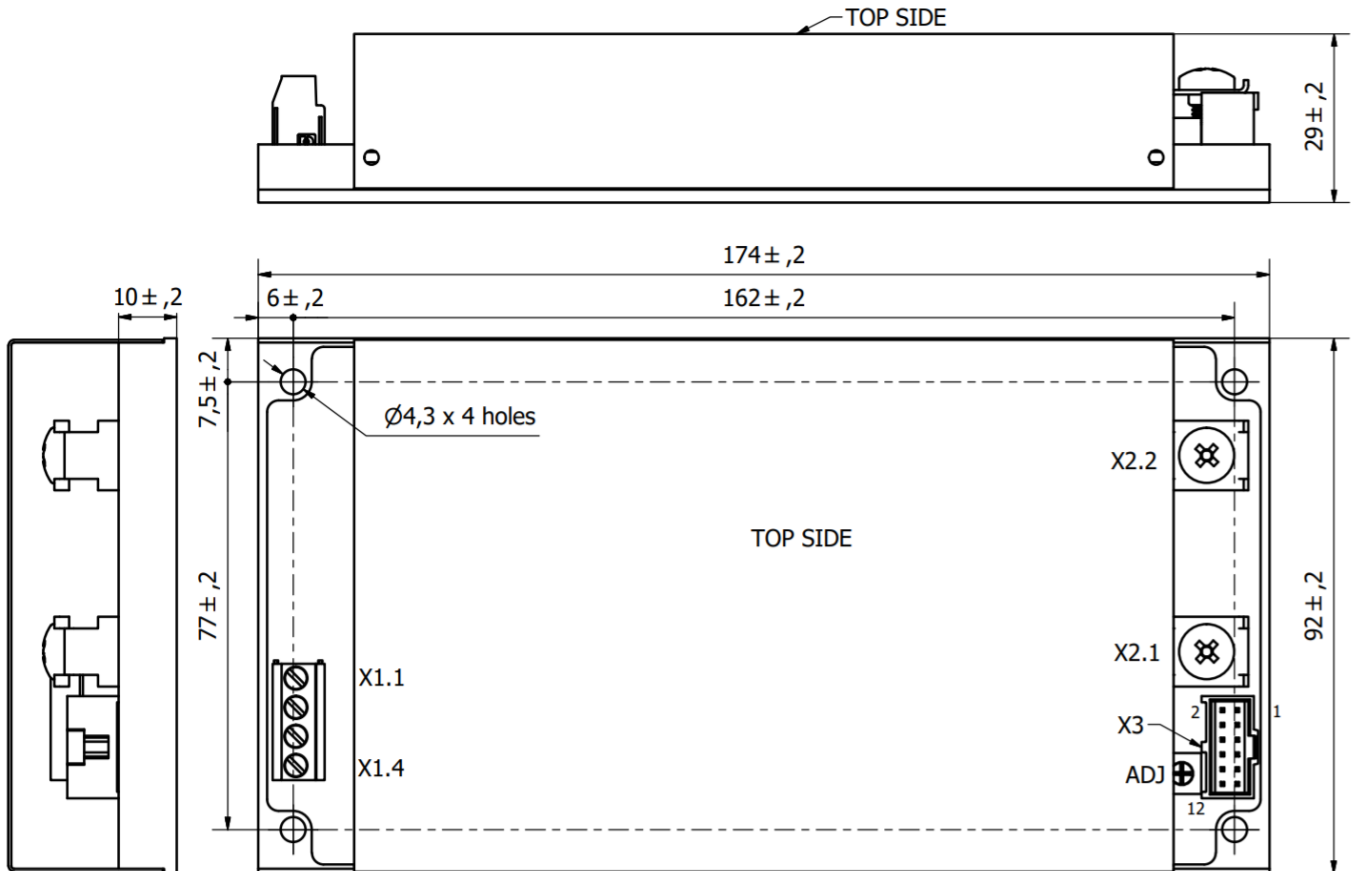
If you have any questions, please contact us directly at [aepe@aepe-group.cz](mailto:aepe@aepe-group.cz).

## Dimensions

X1.1	X1.2	X1.3	X1.4	X2.1	X2.2	X3.1	X3.2	X3.3
GND	A	B	C	-OUT	+OUT	ADJ	PAR	+FAN
X3.4	X3.5	X3.6	X3.7	X3.8	X3.9	X3.10	X3.11	X3.12
-FAN	-RS	-OUT	+RS	+OUT	+AUX	n.a.	-REM	+REM

<b>X1</b>	<b>RATED WIRE SIZE</b> <b>SOLID: max.: 4 mm<sup>2</sup></b> <b>Stranded (flexible): max.: 2.5 mm<sup>2</sup></b> <b>Stranded with Ferrule: max 2.5 mm<sup>2</sup></b> <b>Screw size: M3</b> <b>Torque: 0,5 Nm</b>
<b>X2</b>	<b>Screw size: M5</b> <b>Recommended torque: 2 Nm</b> <b>Recommended: Use ring terminal, for example</b> <b>MOLEX 19323-0013, MOLEX 19324-0013</b>
<b>X3</b>	<b>MOLEX, C-GRID III</b> <b>MALE – SDA-90130-1102.</b> <b>FEMALE – SD-90142-0012 (12 pin) USE WITH "CRIMP TERMINAL" SD – 90119-0109 or other.</b> <b>USE "HAND CRIMP TOOL" for C-GRID III female Crimp Terminals for example 63825-8100 or other depending on the CRIMP TERMINALS.</b>

Dimensions in millimeters, cover rivets may protrude beyond case cover by 0.4 mm on each long side



## Additional information

After ordering the product - the customer is fully responsible for applying the product in strict compliance with mentioned rules and principles of use in the product datasheet and reference technical material (RTM) which is downloadable at [www.aeps-group.com](http://www.aeps-group.com).

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes, etc.) is found at [www.aeps-group.com](http://www.aeps-group.com) or provided via an email request at [aeps@aeps-group.cz](mailto:aeps@aeps-group.cz). All pictures shown are for illustration purpose only, actual product appearance may vary, incl. inner components choice and placement and connectors placement.

According to company's policy in view of constant improvements of the production design the manufacturer reserves the right to change the contents of specifications and promotional materials without prior notice! Make sure you are using the latest documentation downloadable at [www.aeps-group.com](http://www.aeps-group.com).

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