

Features

- Up to 2000 W output power, 36.4 W/in³
- Extreme case operating temp. range for request up to -60° ... +85° C
- Efficiency up to 94 %
- 210x116x37 (mm) milled case
- Input ranges:
"400" - (323-440 VAC, 3ph., 50 Hz) - standard,
"220" - (187-253 VAC, 3ph., 400 Hz) - on request
- Output voltage adjustment
- Remote on/off
- External feedback
- Parallel operation
- Isolated aux. output 12 VDC (FAN)
- Isolated OGOOD pins signaling output state readiness
- Max output capacitance - not limited.
Constant current (CC) mode when charging output capacitance.



Description

JETNA2000-LP are the series of isolated AC/DC power supplies meant to work under both heavy electrical and environmental conditions. Output power is **up to 2000 Watts**, power density is up to **36.4 W/in³**. The units offer you flexibility of wide input range with both extremely low and high case temperatures of **-40° to +85° C (default)**. The units feature a system of over-current protection and over-voltage protection. Standard functions include remote on/off and output voltage trimming. Its versatility allows you to implement the converter in a vast number of industrial applications, supplying capacitive, constant-power and impulse load. Application fields: low-high altitude, land transport, supercomputers, mining, equipment in high and low temperature regions, digital signage equipment, APAR radars and others - where there are needed low-profile and high efficiency.

When ordering nominal power may be chosen from 1200, 1500 and 2000 W

One channel 2000 W model*	Input voltage range**	Power max.	Output voltage nom.***	Output current max.	Efficiency typ.
JETNA2000-400S15-SCx-LP-A5	323-440 VAC or DC equivalent	1500 W	15 V	100.0 A	92 %
JETNA2000-400S24-SCx-LP-A5		2000 W	24 V	83.3 A	93 %
JETNA2000-400S27-SCx-LP-A5		2000 W	27 V	74.1 A	93 %
JETNA2000-400S36-SCx-LP-A5		2000 W	36 V	55.6 A	94 %
JETNA2000-400S48-SCx-LP-A5		2000 W	48 V	41.7 A	94 %
JETNA2000-400S60-SCx-LP-A5		2000 W	60 V	33.3 A	94 %

* Index of temperature range (instead of X): -40...+85° C (N), -50...+85° C (P), -60...+85° C (E).

** Units with different input voltage ranges, may be provided on request (please check the [selection guide](#)).

*** Models with custom output voltage may be provided on request.

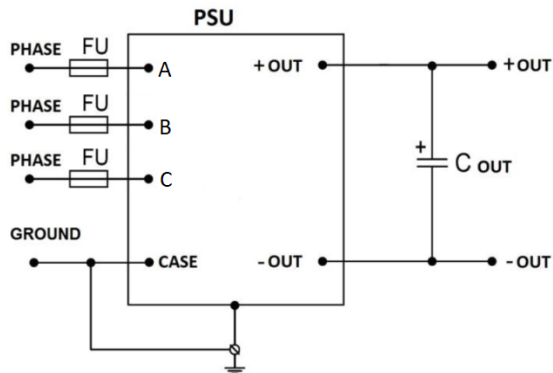
General specifications		
Switching frequency		130 kHz typ. (PWM modulation)
Temperature ranges	operating case temp.	-40° C to +85° C (Standard "N" range)
	storage temp.	-60° C to +85° C
Over-temperature protection		+90° C typ.
Thermal mode and cooling method		conductive via heatsink
Humidity (non-condensing)		5-95 % rel. H
Insulation	input/case	1500 VAC
	input/output, input/REM	3000 VAC
	output/case, output/REM, REM/case	500 VAC
	output/output	500 VDC
Isolating resistance @ 500 VDC		>20 MOhm
Thermal shock, mechanical shock & vibration		MIL-STD-810F
Safety standards		IEC/EN 60950-1
Typical MTBF	$P_{out} = 0.7 \cdot P_{out,max}$	30 000 hrs ($T_{case} = 50^{\circ} C$)
Weight (max)		1500 g
Input specifications		
Input voltage range (with power derating)	"400", 50 Hz	323-440 VAC (3-phase) or 390-620 VDC
	"220", 400 Hz	187-253 VAC (3-phase) or DC equivalent
Start-up input voltage		typ. 300 VAC for "400" and 170 VAC for "220"
EMC standard compliance*	CE MIL-STD-461F, CE EN 55022 - class A (class B with JETAF15-400 filter)	
Power Factor typ.		0.94
Output specifications		
Power derating based on input voltage	<i>no derating</i>	
Output voltage adjustment	in range -20 % ... +5 %, via internal trimmer ADJ or ± 5 % via ADJ output (see drawing)	
Output voltage regulation	input variance $U_{in,min}$ to $U_{in,max}$	± 0.5 % for load 10-100 %
	load variance 10 % to 100 %	± 2 %
Ripple and noise (peak-to-peak)	20 MHz bandwidth	<2 % for load 10-100 %
Protection	over-current	current source behavior: current is limited at 110-125 % of $I_{out,nom}$
	over-voltage	<130 % U_{out}
Capacitive load (max)	<i>not limited</i>	
Remote Off	Unit is shut down by applying 3-5VDC (≤ 5 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 $U_{out} > 0,7 \cdot U_{out,nom}$; HIGH if $U_{out} < 0,7 \cdot U_{out,nom}$. $U_{max} = 20$ V, $I_{max} = 15$ mA	

* See product page for AC/DC filters at www.aeps-group.com.

Please contact the tech. team at aeps@aeps-group.cz for more information.

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

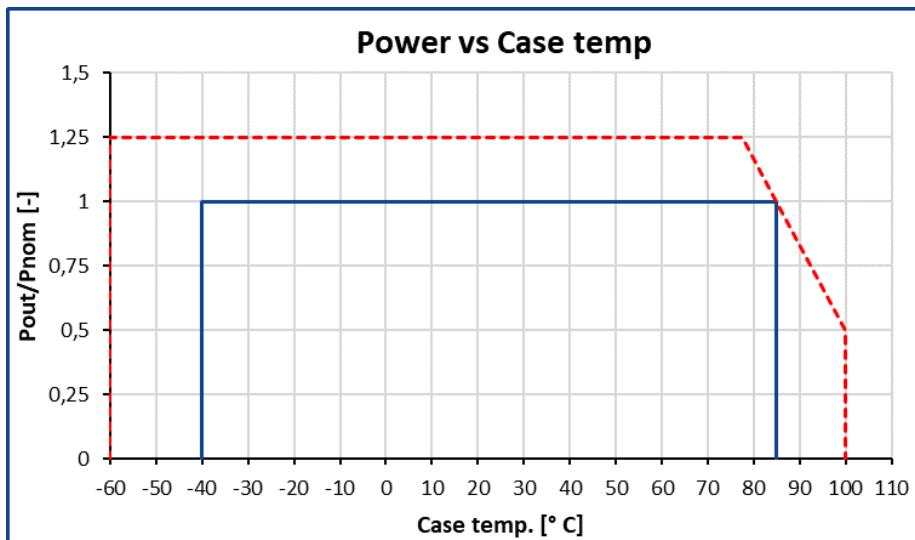
Typical connection scheme (minimum required)



When using the units with typical connection scheme it's necessary to use certain type components.

C out values – please see point 5.6 in [Reference Technical Material](#) on our website.

Power-temperature relationship and cooling principles



— Standard maximum output power.

- - - Possible range of output power for customized product.

Cooling method

The units don't include their own cooling system and may be operated only with a conductive (liquid) or convectional heatsink. Most of the unit's dissipated heat (93-95 %) is concentrated on the bottom surface of the unit, its base, which must be attached to the heatsink surface (aluminum or copper). Requirements for the heatsink surface (preferably milled) - flatness tolerance of the heatsink surface must be lower than 0.1 mm per 100 mm of length, with heatsink base at least 6 mm thick.

Unit's attachment to heatsink

It's mandatory to use unit's central mounting hole to create quality thermal connection between the unit and its heatsink. To mount the unit on a heatsink it's necessary to use all 5 mounting hole points and special attention should be paid to the central mounting hole. Recommended torque 0,5-1 N·m. Screw used for central mounting hole shouldn't enter the hole deeper than shown on the drawing. Violation of these requirements may lead to unit's failure and waiving of warranty.

Mounting screws tightening order should be following: first the central screw, then one pair of diagonally placed screws, then another pair of diagonally placed screws. First tightening of the screws should be done without force. Second tightening of the screws should be done with the recommended torque.

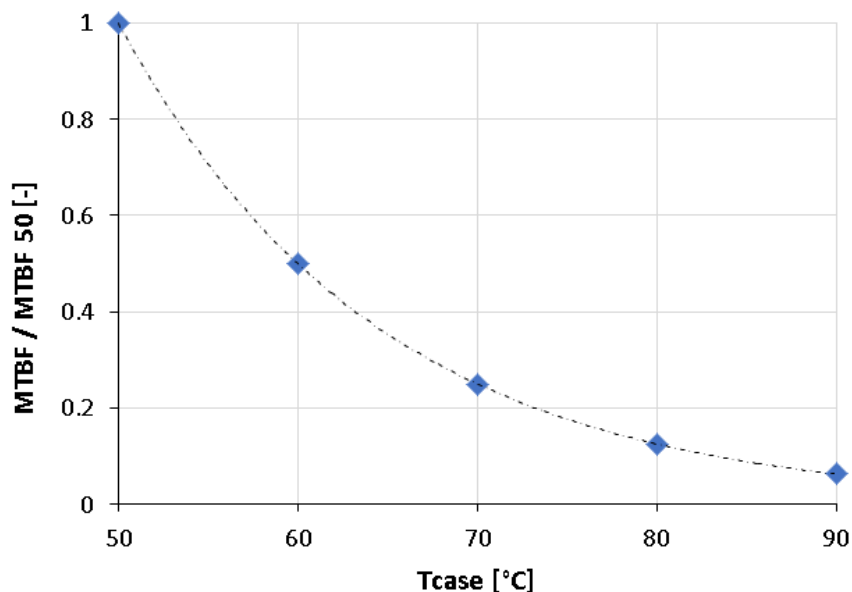
For quality contact between the unit and a heatsink - it's necessary to use thermal conductive paste with thickness less than 100 μm , with thermal conductivity greater than 2 W/(K.m). Mesh stencil should be used to apply the paste in a pattern of squares (i.e. 2x2 mm to 4x4 mm squares mm with 0.5-1 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.

Short-term unit turn-on

If it's necessary to shortly turn on the unit for 3-5 minutes (for example for input-control testing), an aluminium (or 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 4 mm. It's prohibited to use the units without the specified coldplate.

MTBF based on case temperature

When using the unit, a customer must in one way or another monitor maximal heatsink temperature. Maximal heatsink temperature near the center point of the longer unit's side (considered as unit case temperature) must correspond to the expected unit's MTBF. Approximate MTBF function shown on the graph lower, where MTBF / MTBF 50 is unit's MTBF value at chosen unit's case operating temperature relative to value at 50°C unit's case temperature. Maximal unit's case temperature is recorded by internal unit's thermal sensor-monitor.



Thermal protection tripping

When internal unit's thermal protection is tripped (typ. +85°C ... +95°C) the unit is turned off (until automatic restart) and "OGOOD" outputs state becomes high-resistance. Such state should lead to measures of forced heatsink cooling, for example via fans turn-on. In case of long-term unit operation in such conditions (particularly in parallel connection modes or with close-to-zero loads) there is a possibility of failure due to frequent turning off and on at maximal unit's heatsink temperature. 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 limit ambient temperature of air closest to the unit's surfaces.

Operation with shorted outputs

The units have a short-circuit output protection, which is for emergency only, not for long-term operation. It's prohibited to use the units with reversed input voltage polarity or turn on the units with short-circuited outputs (the units have the special detectors inside).

Reliability of parallel unit operation

To maximize reliability of parallel unit system (for case of failure of one parallel-connected units), while minus outputs (-OUT) are directly connected together - the pluses of the units (+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 parallel-connected units must be connected together.

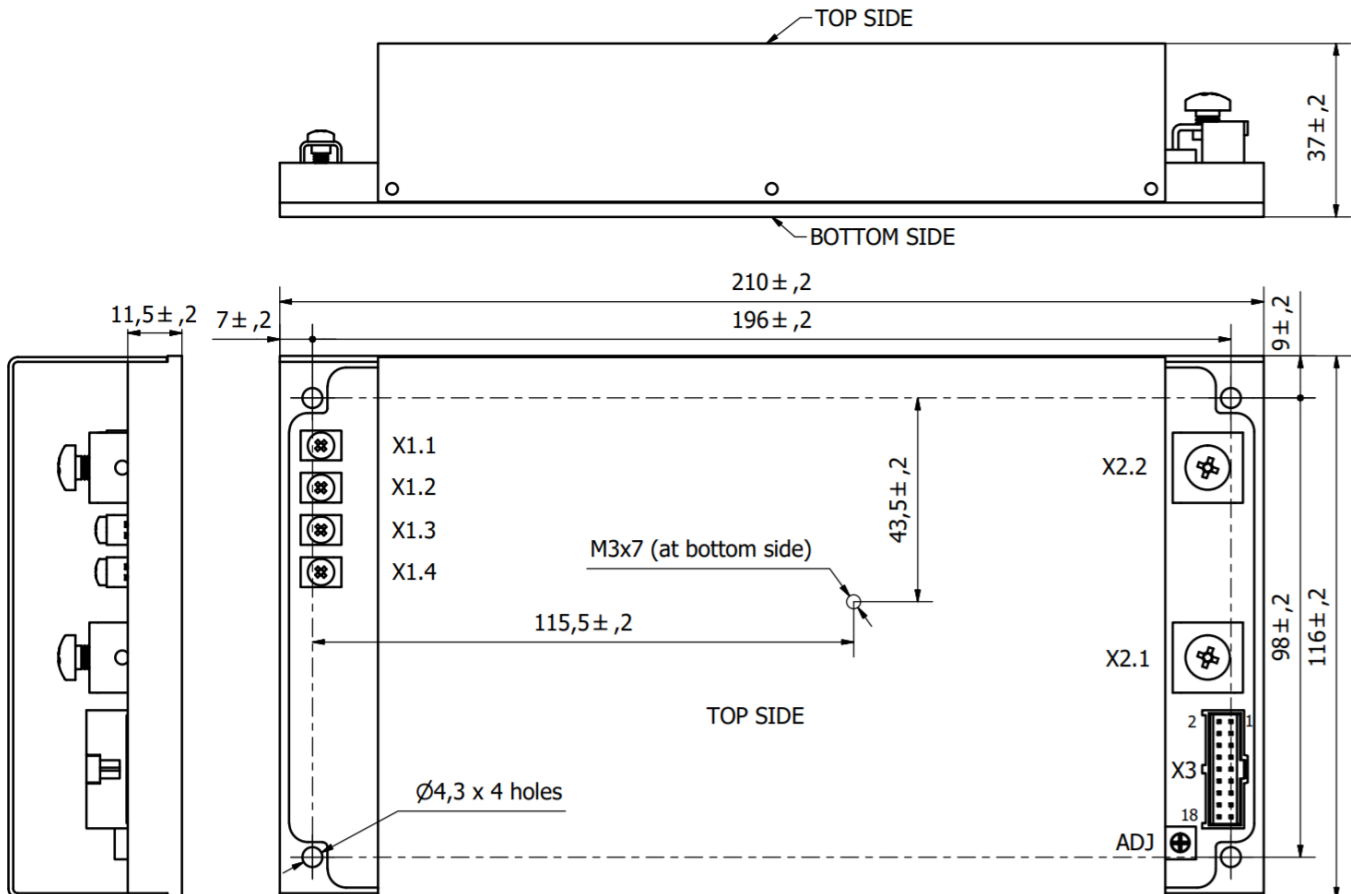
If you have any questions please contact us directly at aeps@aeps-group.cz.

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	+OGOOD	-OGOOD	<i>n.a.</i>
X3.4	X3.5	X3.6	X3.7	X3.8	X3.9	X3.10	X3.11	X3.12
<i>n.a.</i>	ADJ	PAR	+FAN	-FAN	-RS	-OUT	+RS	+OUT
X3.13	X3.14	X3.15	X3.16	X3.17	X3.18			
<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	AUX	-REM	+REM			

X1	RATED WIRE SIZE SOLID: max.: 4mm² Stranded (flexible): max.: 2,5mm² Stranded with Ferrule: max 2,5mm² Screw size: M3 Torque: 0,5 Nm
X2.1 X2.2	Screw size: M5 Recommended torque: 2Nm
X3	MOLEX, C-GRID III. MALE-SDA-90130-1118. FEMALE-SD-90142-0018 (18 pin) USE WITH "CRIMP TERMINAL" SD-90119-0109 or other. USE "HAND CRIMP TOOL" for C-GRID III Female Crimp Terminals for example 63825-8100 or other depending on the CRIMP TERMINALS.

Dimensions in millimeters



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.

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes) is found at www.aeps-group.com or provided via an email request at 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.

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