

Features

- Output power up to 30 W
- Operating case temperature -40 ... +85 °C
- Case dimensions 100x51x20 (mm)
- Component polymer potting protection
- Input "230W" 50 Hz

Description

HL30A series of 1-phase AC/DC isolated power supply units meant for operation in harsh environmental conditions.



1 channel 30W model					
Model part number	Input voltage	Output power	Output voltage	Output current per channel	Typical efficiency at 70 % load
HL30A-230WS12-SHN	100-242 VAC (230 VAC nom.) 1s 264 VAC tran. or DC equivalent	30 W	12 VDC	2.50 A	84 %

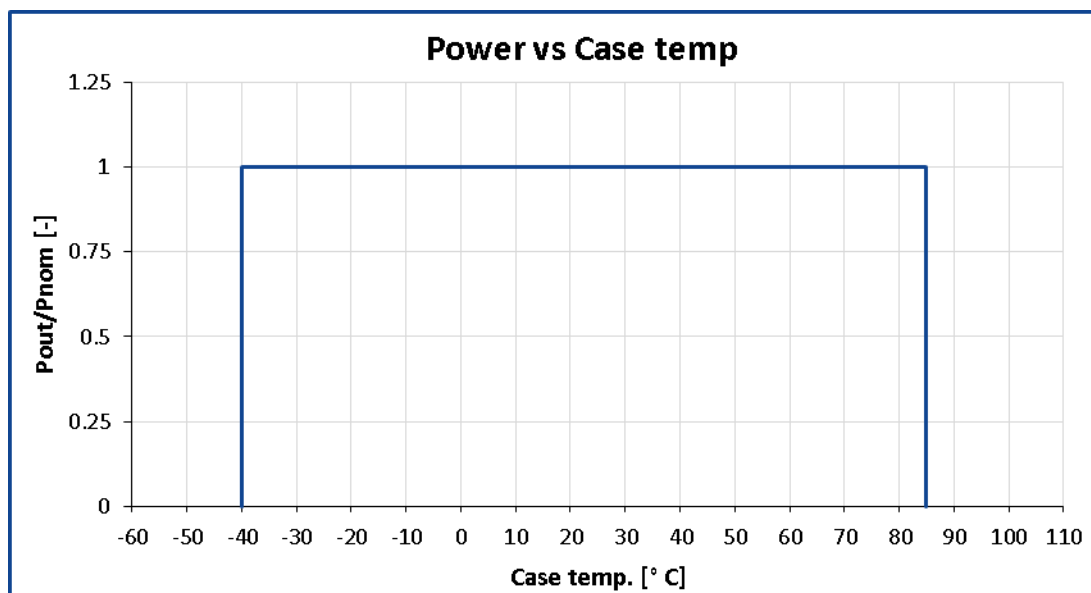
General characteristics ³		
Switching frequency		200 kHz typ. (PWM modulation)
Temperature ranges	case operating temperature	−40° C ... +85° C
	storage temperature	−50° C ... +100° C
Over-temperature protection		+100° C typ.
Thermal mode and cooling method	cooling methods, from most preferred (for the 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	6.4 K/W
Humidity (non-condensing)		5-95 % rel. H
Insulation	in/case	1500 VAC
	in/out	3000 VAC
	out/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	50 000 hrs (Tcase = 50° C)
Weight (max)		180 g
Input characteristics ³		
Input voltage range (with power derating)	"230W"	100-242 VAC, nominal 230 VAC, 50 Hz, 264 VAC 1s tran.
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Start-up input voltage		typ. 90 VAC
Power Factor typ.		>0.67
Output characteristics ³		
Power derating based on input voltage	linear derating, for input "230W"	derating from 30 W to 20 W with input voltage decrease from 175 VAC to 100 VAC
Output voltage adjustment	-	
Output voltage regulation	input variance Uin,min to Uin,max	±1 %
	load variance 10 % to 100 %	<2 % for load 10-100 %
Ripple and noise (peak-to-peak)	20 MHz bandwidth	<2 % for load 10-100 %
Protection	over-current	auto-reset at 110-140 % of Iout,nom
	over-voltage	<130 % Uout
Remote OFF	-	

1. See available filters on www.aeps-group.com.

2. When varying load in the main stabilized channel from 10 % to 100 %, secondary output voltage regulation may reach ±13 %

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

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 fixate the conductors (connected to the thermocouple end) to the base surface at a distance of at least 20 mm. 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-coldplate**, for example, aluminum plate thicker than 2 mm.
- 2) Forced air.
- 3) Convectonal 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 surface of the unit, its base, 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.

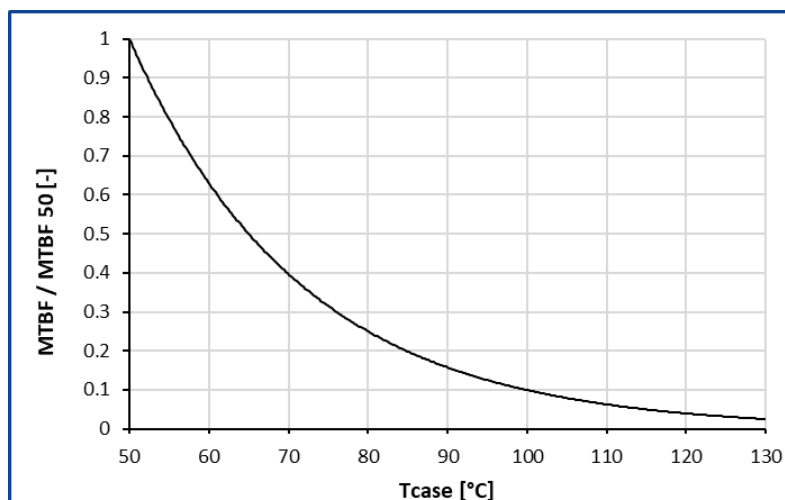
For quality contact between the unit and a heatsink - it's necessary to use thermal conductive paste with thickness less than 0.1 mm, with thermal conductivity **greater than 5 W/K.m**. The paste must be applied with mesh stencil in a pattern of squares (i.e. 2x2 mm to 4x4 mm squares mm with 0.5-1 mm 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 8 mm. The unit must be placed on coldplate through a thin (0.15-0.3 mm) silicone-based heat-conducting sheet.

5. MTBF dependance 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.



6. Thermal protection tripping

When internal unit's thermal protection is tripped (typ. +100°C) 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.

7. 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).**

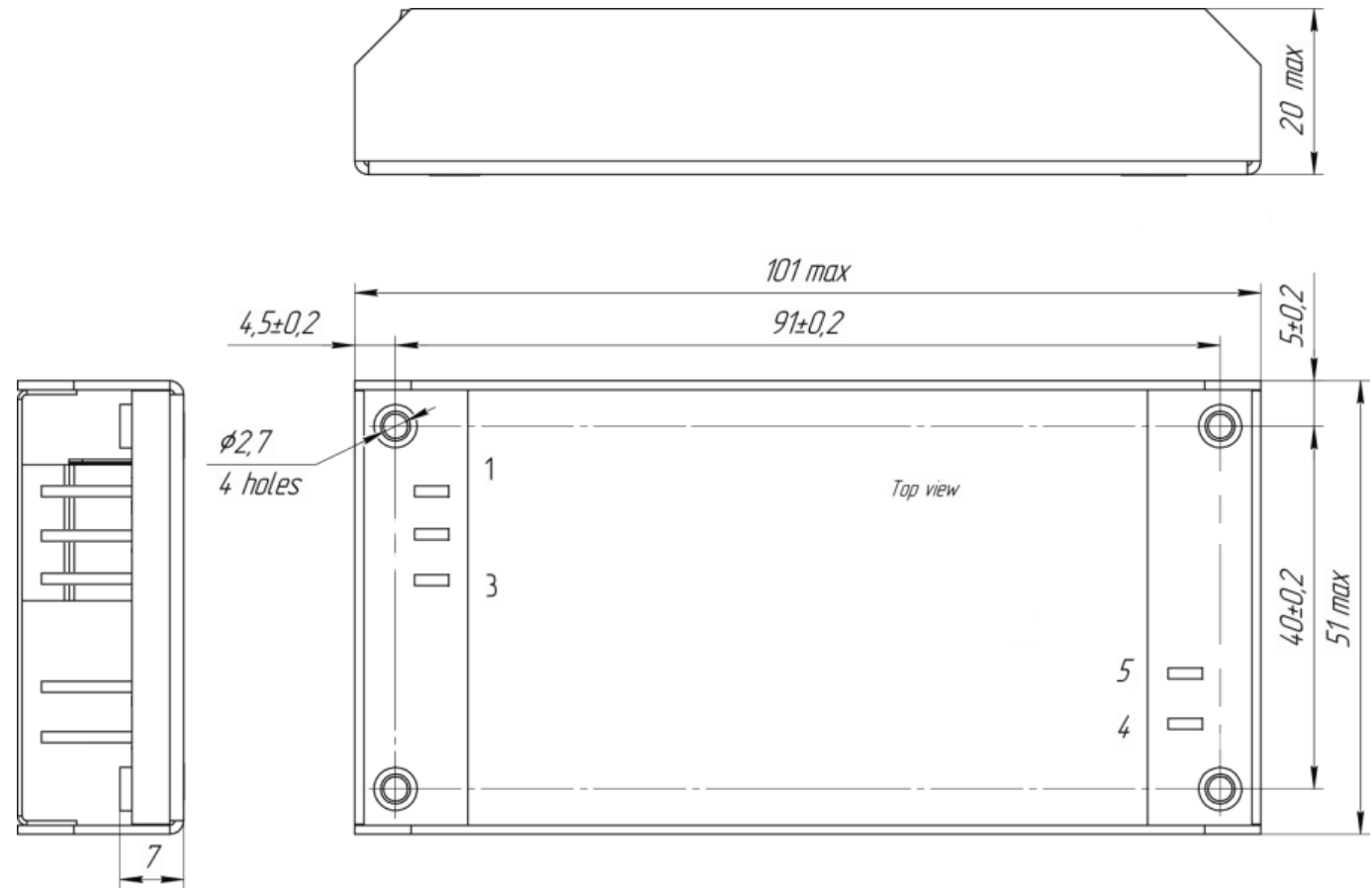
If you have any questions, please contact us directly at aepe@aepe-group.cz.

Dimensions

Pin #	1	2	3	4	5
One channel	GND	L	N	+OUT	-OUT

IN/OUT	Blade connectors, 2.8 mm by 0.81 mm in cross-section
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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, etc.) 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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