RLH Industries, Inc.

PRODUCT INFORMATION

The leader in fiber optic telecommunications technology.

R2009A-110509

RLH 1000 Series AC/DC Power Supply

HIGH CAPACITY ISOLATED POWER

Product Specifications

Figure 1. *RLH 1000 Series AC/DC Power Supply*

Description

The RLH 1000 Series Rack Mount AC/DC Converter is an isolated DC power source designed to provide constant power to telecom and industrial equipment. There are several models available, rated up to 60A. They feature recessed front panel input power circuit breakers and a digital ammeter for monitoring the output current.

The converters have dual inputs with automatic internal switching for connecting redundant power input sources, and three position output terminals for connecting multiple devices. Each input is protected by heavy duty circuit breakers.

The Series 1000 AC/DC converter is an EIA 19/23 inch 2RU rack mountable enclosure, with both front or telco center style rack ear mounting.

Contents

Standard Features	
Dual, heavy duty, high cycle life, front mounted input breakers	Universal AC input / full range
Breakers meet Mil-STD-202 for environmental durability	Built-in short circuit, overload, over-voltage and over-temperature protection.
High current output up to 60 Amps	Auto switching dual input terminal for redundant power input sources
Output OK signal and LED current meter	Built-in alarm for remote sensing
Heavy duty powder coated enclosure	Forced air cooling with built-in fan and speed control
EIA 19in and 23in 2 RU rack mount ears	Commercial grade terminal blocks
AC input active surge current limiting	Exclusive lifetime warranty

Specifications subject to change without notice.

General Safety Practices

The equipment discussed in this document may require tools designed for the activity being described. RLH recommends that service personnel be familiar with the correct handling and use of any installation equipment used, and follow all safety precautions including the use of protective personal equipment as required.

Caution - Severe Shock Hazard

- Never install during a lightning storm or where unsafe high voltages are present.
- This equipment uses high AC and DC voltages and current, do not touch terminals when power is applied.
- Use caution when handling copper wiring and follow appropriate safety regulations.
- An external Surge Protective Device (SPD) is not required.

Mounting Information

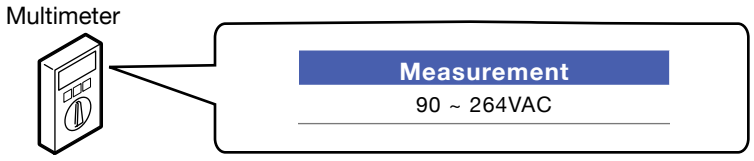
The power converter is intended to be shelf or rack mounted using the supplied rack hardware. Use a rack sufficiently strong enough to support converter. This unit is not weatherproof, and must be mounted indoors or in a weather proof enclosure if used outdoors.

Installation

Prior to installation:

- Check for shipping damage
- Check the contents to ensure correct model and powering options
- Have a clean, dry installation environment ready

Measure the AC voltage of the source power. Ensure the power is within range of the converter being used to avoid damage when power is applied.



Note: When installing into an environment with a circuit breaker before the converter, it must be rated at 1.5 times (minimum) the output current rating of the converter. For example, use a 60A circuit breaker for a 40A output converter (1.5 x 40 = 60).

Do not connect AC power to the converter at this point.

Install into equipment rack

Mount the power converter in to a 19/23 inch equipment rack using the mounting brackets provided.

Connect equipment

Set the front panel breaker switches to OFF to prevent the output terminals from accidently becoming energized. Connect the Fiber Optic Link Cards or other equipment to their respective + POS and – NEG DC OUTPUT terminals.

Note: Always make sure the front panel breakers are OFF before making connections to the output terminals.

Connect input terminals

Turn OFF and lock out the AC circuit breaker at the source panel for incoming power. Ensure that power is removed from the source wiring prior to making any connections.

Connect the primary AC source wires to the AC INPUT number 1 terminal, located at back left of the enclosure, see Figure 2. The 3 terminal connections are for ground (GND), line (L) and neutral (N). The GND terminal must be used to prevent damage or injury from lightning or other high voltage events.

Note: The primary input terminal is number 1, the secondary (auto fallover) terminal is number 2.

Connect a secondary (redundant) AC power source (if used) to INPUT 2. Check to make sure the front panel breaker switches are OFF.

Figure 2. Rear panel connections

Apply input power

Double check all connections. Apply power to the input wiring by turning on the source AC power breaker back at the panel.

Once the AC input power is energized, set the front panel breaker switches to ON. The output terminals are now energized. The green DC INPUT LED(s) will come ON, indicating power at the input terminals. The yellow DC OUTPUT LED will come ON, indicating isolated power is being output. The digital LED OUTPUT AMPS current meter will display the total output current. Double check output power at the DC OUTPUT terminals with a multimeter.

Troubleshooting

Troubleshooting the DC/DC converter always begins with the observation of the status LEDS. The green LED(s) indicates DC INPUT, and the yellow LED indicates DC OUTPUT on (+) and (-) terminals. The red digital ammeter indicates the output current. Refer to Table 1, Front Panel Indicators.

The front breakers will trip if the current being drawn through them exceeds the rating of the converter. Refer to the General Specifications for output information including overvoltage protection limits. If the breakers continue to trip, disconnect all cards/equipment from the output terminals. Reconnect cards/equipment one at a time to pinpoint trouble.

Table 1. Front panel indicators

Breaker 1 Green LED	Breaker 2 Green LED	Yellow LED	Description
ON	ON	ON	Both breaker switches ON: Normal Operation with primary and secondary power sources connected. Note that these LEDS will be ON even if equipment is disconnected from the system.
OFF	ON	ON	Both breaker switches ON: Loss of AC Input on the primary input, now operating from secondary input.
ON	OFF	ON	Both breaker switches ON: Loss of AC Input on the secondary input, or no secondary input used. Now operating from primary input. Breaker 2 is OFF: Operating from primary input only.
OFF	OFF	OFF	Both breaker switches ON: Loss of AC Input power. Check power source. If source power is within limits then converter is inoperative. Contact RLH technical support. Both breaker switches OFF: If the breakers have tripped, disconnect all cards/ equipment from the output terminals. Reconnect one at a time to pinpoint trouble.
ON	ON	OFF	Both breaker switches ON: Output voltage has been shut down by internal constant current limiter or input overvoltage. Switch breakers OFF then ON to recover. Overtemperture condition has shut down output voltage. Unit will recover after temperature goes down. If DC power does not recover, contact RLH technical support.

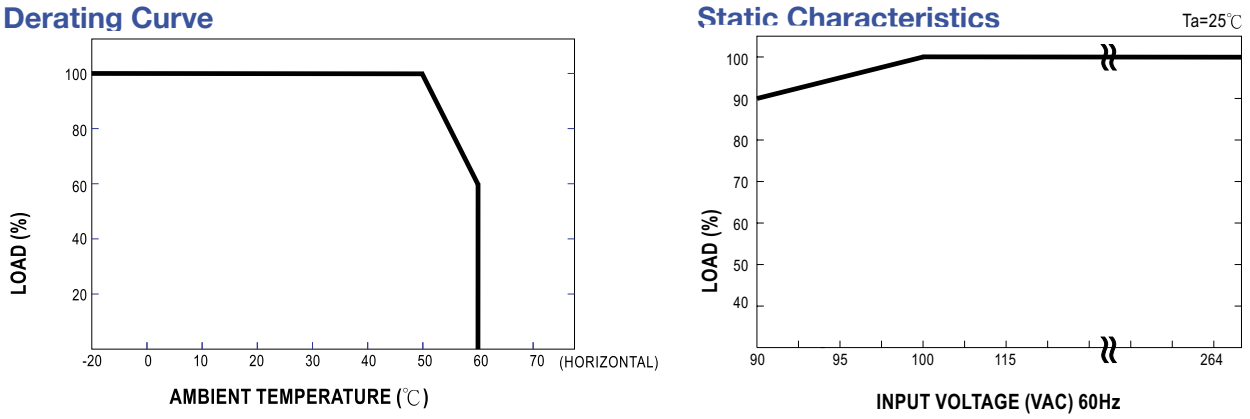


Figure 3. Derating curve and static characteristics

Ordering Information

AC Input	DC Output	Max. Output	Part Number
90 ~ 264VAC	12V	60A	8806-1761-01
	24V	40A	8806-1779-01
	48V	21A	8806-1767-01

▶ Please contact your RLH sales representative for pricing and delivery information

General Specifications

Specifications		12VDC units	24VDC units	48VDC units
Output	**DC Voltage**	12V	24V	48V
	Rated Current	60A	40A	21A
	Current Range	0 ~ 60A	0 ~ 40A	0 ~ 21A
	Rated Power	720W	960W	1008W
	Ripple & Noise *2	150mVp-p	150mVp-p	150mVp-p
	Voltage Tolerance *3	±1.0%	±1.0%	±1.0%
	Line Regulation	±0.5%	±0.5%	±0.5%
	Load Regulation	±0.5%	±0.5%	±0.5%
Input	**Voltage Range *4**	90 ~ 264VAC		
	Frequency Range	47 ~ 63Hz		
	Power Factor (Typ.)	0.95/230VAC		
	Efficiency (Typ.)	83%	88%	90%
	AC Current (Typ.)	12A/115VAC		
	Inrush Current (Typ.)	25A/115VAC		
	Leakage Current	<2.0mA/240VAC		
Protection	**Overload**	105 ~ 125% rated output power		
		Protection Type: Constant current limiting, recovers automatically after fault condition is removed.		
	Over Voltage	13.8 ~ 16.8V	27.6 ~ 32.4V	56.6 ~ 66.2V
		Protection Type: Shut down o/p voltage, re-power on to recover.		
	Over Temperature	85°C±5°C (TSW2) detect on heatsink of o/p diode; 75°C±5°C detect on (TSW1) heatsink of power transistor		
		Protection Type: Shut down o/p voltage, recovers automatically after temperature goes down.		
Function	**DC OK Signal**	The TTL signal out, PSU turn on = 3.3 ~ 5.6V; PSU turn off = 0 ~ 1V		
Environment	**Working Temperature**	-20 ~ +60°C (Refer to output load derating curve)		
	Working Humidity	20 ~ 90% RH non-condensing		
	Storage Temp., Humidity	-40 ~ +85°C, 10 ~ 95% RH		
	Temp. Coefficient	0.02%/°C (0 ~ 50°C)		
	Vibration	1 ~ 500Hz, 2G 10min./1 cycle, 60min. each along X,Y, Z axes		
Safety & EMC	**Safety Standards**	UL60950-1, TUV EN60950-1 approved		
	Withstand Voltage	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC		
	Isolation Resistance	I/P -I/P, I/P-FG, O/P-FG:100M Ohms/500VDC 25°C 70%RH		
	EMI Conductance & Radiation	Compliance to EN55022 (CISPR22)		
	Harmonic Current	Compliance to EN61000 -3-2, -3		
	EMS Immunity	Compliance to EN61000-4-2,3,4,6,8,11; ENV50204, EN55024, EN61000-6-2, EN61204-3, light industry level, criteria A		

Note

1. Ripple parameters NOT specially mentioned are measured at 48, 96VDC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance: Includes set up tolerance, line regulation and load regulation.
4. Derating may be needed under low input voltages. Please check the derating curve for more details.

Warranty

RLH is recognized throughout the U.S. and offers the only **UNCONDITIONAL LIFETIME WARRANTY** in the industry. We are very proud of our warranty which simply states that the product is warranted to be free of defects in material and workmanship for the **LIFE OF THE PRODUCT**. Batteries carry a 5- year unconditional warranty.

- We believe our customers shouldn't have to incur additional costs due to failure or damage
- We engineer our products with total confidence in our quality
- We understand how safety and reliability impact the total cost of ownership
- We know that customer support extends beyond the initial sale, so **we stand behind our products**

RLH will replace any product, or part thereof, that fails **FOR ANY REASON**, provided the defective part is returned to RLH Freight prepaid. This warranty is **UNCONDITIONAL** and valid even when RLH products have been abused or mishandled, or the product has been damaged as a result of a natural disaster. This warranty will reduce your costs and simplify your maintenance activities. Not all RLH products are covered by this warranty.

To make a warranty claim, or schedule repair or replacement of your RLH product, please contact us for an RMA number. You will be promptly assisted by one of our warranty specialists. All returns must have an RMA number before we can receive any items.

Technical Support

Normal technical support: (Mon - Fri 6am - 6pm PST)	Local (714) 532-1672 Toll Free (800) 877-1672 Toll Free (866) DO-FIBER
24/7 Technical support:	(714) 366-2503 (714) 457-5740

Contact Information

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Please contact your RLH sales representative for pricing and delivery information.

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