

RLH 500 Series AC/DC Power Supply

HIGH CAPACITY ISOLATED POWER

Description

The RLH 500 Series Rack Mount AC/DC power supply is an isolated DC power source designed to provide constant power to telecom and industrial equipment. There are two models available, with either 24VDC or 48VDC output, rated up to 42A. They feature heavy duty, recessed front panel input power circuit breakers for safety, 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 DC output terminals for connecting multiple devices. Each input is protected by heavy duty circuit breakers.

The Series 500 AC/DC power supply is an EIA 19/23 inch 2RU rack mountable unit, with both front or telco center style rack ear mounting.



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Standard Features

Dual, heavy duty, high cycle life, front mounted input breakers	Universal AC input / full range, active surge current limiting
Built-in short circuit, overload, over-voltage and over-temperature protection.	Auto switching dual input terminal for redundant power input sources
High current output up to 60 Amps	Breakers meet Mil-STD-202 for environmental durability
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

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

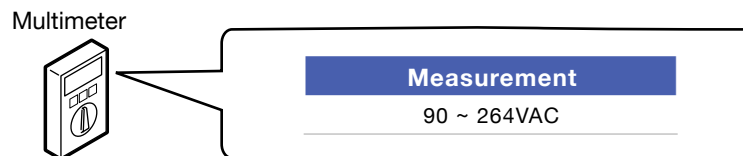
The power converter is intended to be shelf or rack mounted using the supplied rack hardware. Use a rack sufficiently strong enough to support converter. This unit is not weatherproof, and must be mounted indoors or in a weather proof enclosure if used outdoors.

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 70A circuit breaker for a 42A output converter ($1.5 \times 42 = 63$, rounded up to more commonly available 70A size breaker).

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.

Connecting equipment

Set the front panel breaker switches to OFF to prevent the output terminals from accidentally 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 power 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, refer to rear panel picture below. 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.

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



Front panel switches and indicators

Once the AC INPUT power is energized, set the front panel breaker switches to the ON position. **The DC OUTPUT terminals are now energized.** The blue POWER LED(s) will be ON, indicating the presence of AC power at the input terminals, and the energizing of the output terminals. The yellow DC POWER LED will be ON, indicating isolated power is being output on (+) and (-) output terminals. 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 and adjust accordingly using the Output Voltage Adjustment potentiometer on the front panel.

Troubleshooting

Troubleshooting the AC/DC power supply always begins with the observation of the status LEDs. When the breakers are switched on, the blue LED(s) indicates the presence of AC INPUT power, and the yellow DC POWER LED indicates regulated DC output.

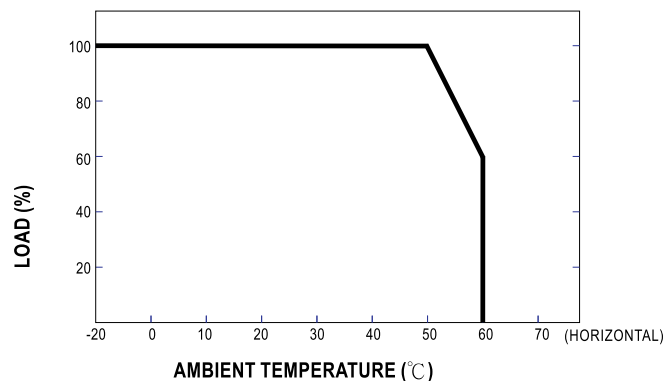
The front breakers will trip if the current being drawn through them exceeds the rating of the converter. Refer to the General Specifications for output information including over-voltage protection limits. If the breakers continue to trip, disconnect all cards/equipment from the output terminals. Then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

Front panel indicators

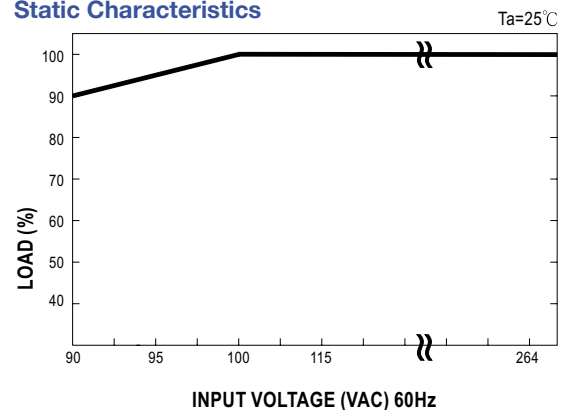
Breaker 1 Blue LED	Breaker 2 Blue LED	Yellow LED	Description
ON	ON	ON	Both breaker switches ON: Normal Operation with primary and secondary power sources connected. Note that these LEDs will be ON even if equipment is disconnected from the system.
OFF	ON	ON	Both breaker switches ON: Loss of AC Input 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 over voltage. Switch breakers OFF then ON to recover. Over temperature condition has shut down output voltage. Unit will recover after temperature goes down. If DC power does not recover, contact RLH technical support.

Derating curve and static characteristics

Derating Curve



Static Characteristics



General Specifications

Specifications		24VDC model	48VDC model
Output	DC Voltage	24V	48V
	Rated Current	21A	10.5A
	Current Range	0 ~ 20.8A	0 ~ 10.5A
	Rated Power	499.2W	504W
	Ripple & Noise *2	150mVp-p	200mVp-p
	Voltage Tolerance *3	±1.0%	±1.0%
	Line Regulation	±0.2%	±0.2%
	Load Regulation	±0.5%	±0.5%
Input	Voltage Range *4	90 ~ 264VAC	
	Frequency Range	47 ~ 63Hz	
	Power Factor (Typ.)	0.95/230VAC 0.98/100VAC at full load	
	Efficiency (Typ.)	84%	86%
	AC Current (Typ.)	7A/115AVC	3.5A/230VAC
	Inrush Current (Typ.)	20A/115VAC	40A/230VAC
	Leakage Current	<1mA / 240VAC	
Protection	Overload	110 ~ 125% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed	
	Over Voltage	27.6 ~ 32.4V	57.6 ~ 67.2V
	Over Temperature	Protection Type: Shut down o/p voltage, re-power on to recover.	
		RTH2 ≥ 95°C detect on heatsink of Q1, Q7 power transistors & L3 output choke Protection type: Shut down o/p voltage, recovers automatically after temperature goes down	
Environment	Working Temperature	-10°C ~ +60°C	
	Working Humidity	20 ~ 90% RH with 30CFM forced air non-condensing	
	Storage Temp., Humidity	-20 ~ +85, 10 ~ 95% RH	
	Temp. Coefficient	0.03%/°C (0 ~ 50°C)	
	Vibration	10 ~ 500Hz, 2G 10min./1 cycle, 60min. each along X, Y, Z axes	
Safety & EMC	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) Class B	
	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, heavy 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.

Ordering Information

AC Input	DC Output	Max. Output	Part Number
90 ~ 264VAC	24V	21A	8806-1679-01
	48V	10.5A	8806-1667-01

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

Technical Support

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Specifications subject to change without notice.