



Power Supply

Users Guide

**PRODUCT MANUAL**



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## 1 Overview

The Power Supply Chassis with one (1) or two (2) Power Supply Module(s) can be rack mounted in a 19" two (2) post rack or four (4) post rack. Some of the features included in this Power Supply are as follows:

- 44 mm low profile, suitable for standard 1U rack applications
- Universal AC input / Full range.
- Built-in active PFC function, PF>0.96.
- Protections: short circuit / overload / over voltage / over temperature.
- Active current sharing up to 3000W (3 units) in one 19" rack; up to 3 racks (8units maximum) can be connected in parallel.
- Remote control for single RCP-1000 unit.
- Built-in remote sense function.
- Output voltage can be trimmed between 90~110% rated output voltage.
- Hot swap operation.
- AC OK and DC OK signal output.
- Forced air cooling by built-in DC fan with fan speed control function.
- Built-in 5V / 0.3A auxiliary output.
- Internal ORing diode.




## 2 Unpacking and Physical Inspection of Components

The unpacking of your components as shown in Table 2-1 includes: taking an inventory of the contents of the packing container, physically unpacking and inspecting the components for any noticeable damage that might have occurred during shipping.

The components of your Power Supply depend on the configuration that you purchased.

<p>Power Supply Chassis (shown with two modules installed)</p>	
<p>Power Supply Module(s) one (1) or two (2) (installed in the Power Supply Chassis)</p>	
<p>8' Power Cord 13 A rating (one for each Power Supply Module)</p>	
<p>RCP-1U Loop Back Connector <b>NOTE:</b> This must be installed on the back of the chassis for the Power Supply to provide DC power</p>	
<p>Power Supply Support Brace (attached to Power Supply Chassis)</p>	
<p>Accessory Kit for the Power Chassis including:</p> <ul style="list-style-type: none"> <li>• Terminal Guide (for covering the DC Output Screw Terminals)</li> <li>• Two (2) Terminal Rings 16-14 AWG ¼" Insulation</li> <li>• USB with the Power Supply Users Guide</li> </ul>	

Table 2-1: Unpacking and Physical Inspection

Step	Procedure	Illustration
1	Open the box	
2	Remove the power cord(s) on the top of the cardboard insert	
3	Remove the cardboard insert	
4	Remove the RCP-1U from the packing material	
5	Remove the packing material protecting the Power Supply Chassis	
6	Remove the Accessory Kit bag for the Power Supply Chassis	
7	Lift the Power Supply Chassis out of the box and remove packing material from the Chassis	
8	Inspect the Power Supply to verify that no damage occurred during shipping	

### 3 Indicators and Connectors

Figure 3-1 shows the front of the Power Supply Chassis. Table 3-1 provides a description of the Power Supply indicators.

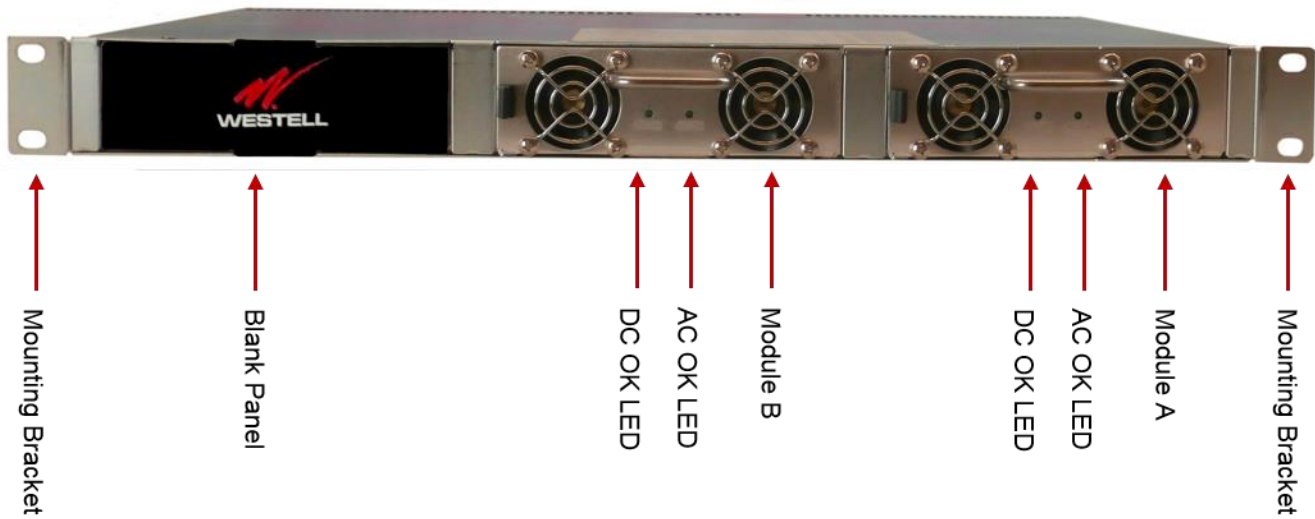


Figure 3-1: Power Supply Chassis Front

Table 3-1: Front Panel Indicators and Corresponding Signal at Function Pins

Function	LED	Description	Signal *	PSU Output
AC-OK	ON	When input voltage $\geq 82V \pm 4V$	0 ~ 0.5V	ON
AC-NG	OFF	When input voltage $\leq 82V \pm 4V$	4.5 ~ 5.5V	OFF
DC-OK	ON	When input voltage $\geq 80\% \pm 5\%$ of $V_o$ rated	0 ~ 0.5V	ON
DC-NG	OFF	When input voltage $\leq 80\% \pm 5\%$ of $V_o$ rated	4.5 ~ 5.5V	ON
T-OK	-	When the internal temperature (TSW1 and TSW2 short) is within safe limit	0 ~ 0.5V	ON
T-ALARM	-	When the internal temperature (TSW1 or TSW2) exceeds the limit of temperature alarm	4.5 ~ 5.5V	OFF

\* Signal between function pin and "-S".

Figure 3-2 shows the back of the Power Supply Chassis.

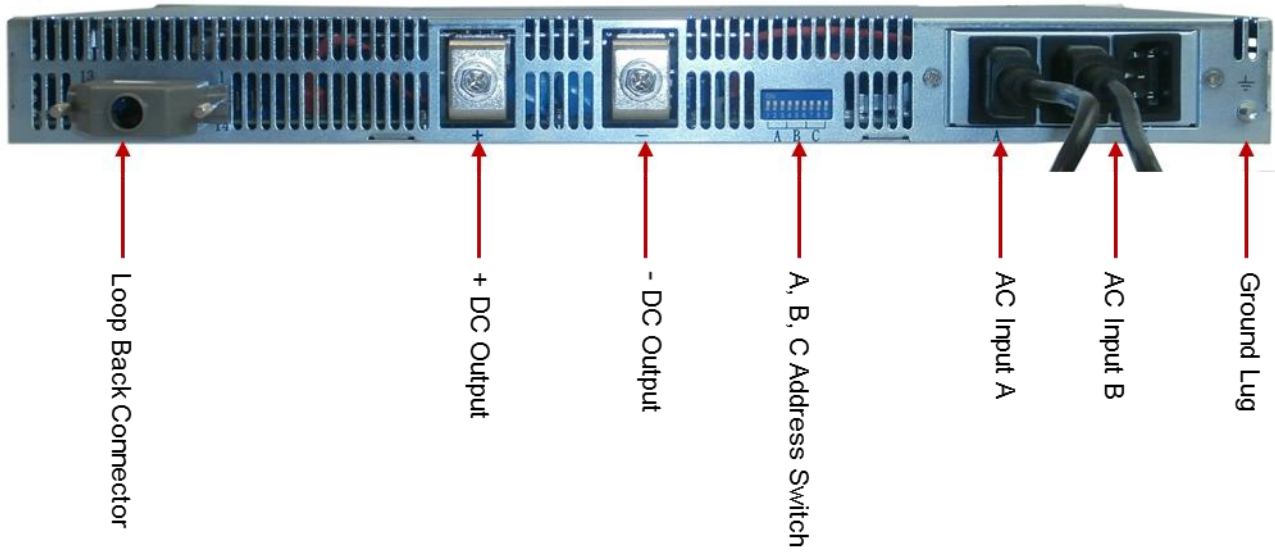


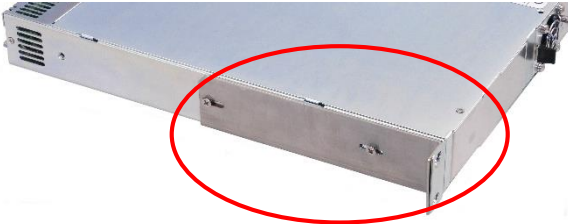

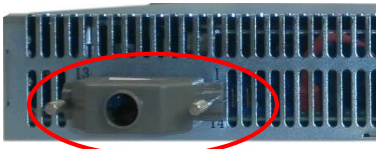


Figure 3-2: Power Supply Chassis Back

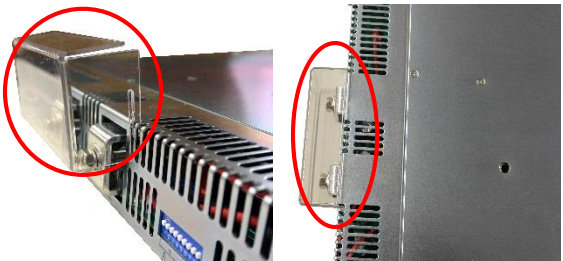



## 4 Installation

Follow the steps in Table 4-1 for the installation of the Power Supply Chassis.

Table 4-1: Installation

Step	Procedure	Illustration
1	<p>Before mounting the Power Supply Chassis into a rack make sure that the Power Supply Support Brace is installed</p> <p>For mounting onto a wall for the DSP95 Modular 255 Series:</p> <ul style="list-style-type: none"> <li>• Unscrew the four (4) screws that attach the Brace to the Power Supply</li> <li>• Mount the Brace to the wall with four (4) screws</li> <li>• Install the Power Supply onto the Brace and fasten with the four (4) screws</li> </ul>	
2	<p>Fasten the front of the Power Supply Chassis to the racks front posts using the mounting holes provided on the front panel</p>	
3	<p>Plug the RCP-1U into the back left hand side of the Power Supply Chassis</p>	
4	<p>Plug the PowerCord(s) into the back right hand side of the Power Supply Chassis</p>	
5	<p>DC Output – Attach the appropriate power supply cable to the screw terminals for output of -48 DC. These are located at the center back of the Power Supply Chassis</p> <p><b>NOTE:</b> For using with a <b>DSP95 Modular 255 Series</b> use the power supply cable (820-2222-001) that ships with the DSP unit</p>	

Step	Procedure	Illustration
	<p>For using with a <b>UDIT Chassis and Control Module</b> use the 16 AWG UDIT power supply cable (820-2355-001) that ships with the UDIT Control Module. Fasten the terminal rings supplied in the Power Supply Chassis Accessory kit to the ends of the Power Cable before attaching to the screw terminals.</p>	
6	<p>Place the Terminal Guide over the DC Output Screw Terminals</p>	
7	<p>Ground the Power Supply Chassis to the ground bus bar or rack</p> <p><b>NOTE:</b> If grounding to the rack, be sure there is no paint on that area of the rack where the ground lug will be attached to assure that a solid ground between the lug and rack is made</p> <p>Follow local grounding procedures regarding scraping the paint from the rack, use of metal piercing washers etc.</p>	

## 5 Hot Swap Operation

With a built-in "Oring diode" in every Power Supply Module the Module can be hot swapped without turning off the AC power source provide to the whole Power Supply Chassis.


Press the clip as indicated in Figure 5-1, then grasp the handle and pull the module out to remove. Insert a new Power Module by grasping the handle and pushing the module into the rack.



Figure 5-1: Power Module Clip

## 6 Safety Guidelines

Any kind of failure should be examined by a qualified technician.

- Do not remove the chassis by yourself! Risk of electrical shock or energy hazard could happen.
- Do not change any component by yourself or make any kind of modification.
- Do not install in places with high moisture or near the water.
- Do not install in places with high ambient temperature or under direct contact of sunlight.
- The rated input voltage / frequency are 100~240VAC and 50/60 Hz. Do not feed in AC power that is over 10% of the rated value.
- Safety protection level of this unit is class I.
- The grounding wire should be firmly fixed at the "FG" terminal (  ) of the rack.
- The total leakage current of the rack system is less than 3.5mA.
- Refer to the safety label as shown in Figure 6-1 on the top of each unit before operating.

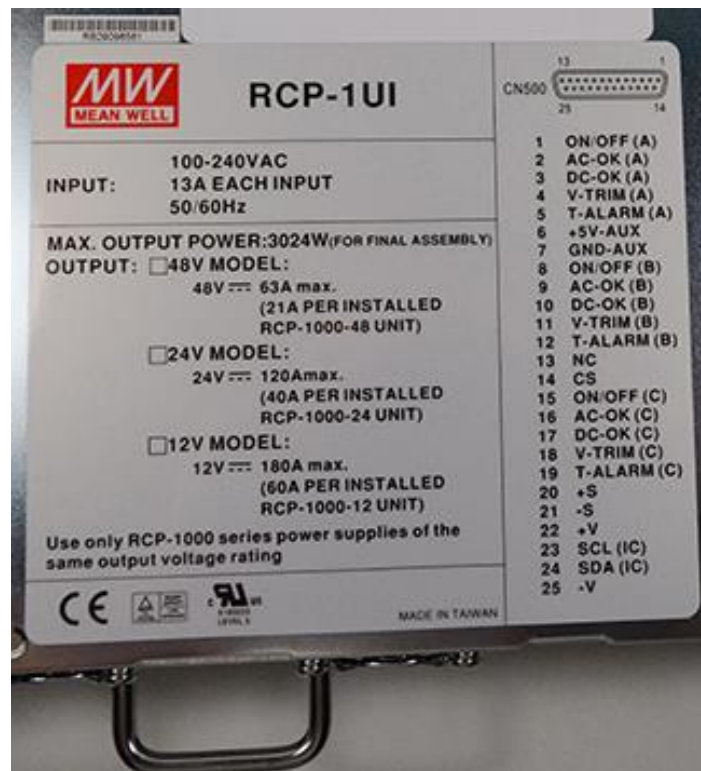


Figure 6-1: Safety Label

## 7 Specifications

Single unit Power Module specifications are shown in Table 7-1. Power Supply Chassis specifications are shown in Table 7-2.

Table 7-1: Single Unit Power Module Specifications

Description		Specification
<b>Output</b>	DC Voltage	48V
	Rated Current	21A
	Current Range	0 ~ 21A
	Rated Power	1008W
	Ripple & Noise (Max.) <b>Note 2</b>	300mVp-p
	Voltage Adj. Range	46.3 ~ 49.7V
	Voltage Tolerance <b>Note 3</b>	±1.0%
	Line Regulation	±0.5%
	Load Regulation	±0.5%
	Setup, Rise Time	1000ms, 60ms/230VAC at full load
	Hold Time	16ms/230VAC at full load
<b>Input</b>	Voltage Range <b>Note 5</b>	90 ~ 26VAC 127 ~ 370VDC
	Frequency Range	47 ~ 63Hz
	Efficiency (Typ.)	89%
	AC Current (Typ.)	11A/115VAC 5.5A/230VAC
	Inrush Current (Typ.)	COLD START 50A
	Leakage Current	< 1.1mA / 230VAC
<b>Protection</b>	Over Load	105 ~ 125% rated output power
		Protection type : Constant current limiting, recovers automatically after fault condition is removed
	Over Voltage	52.8 ~ 64.8V
		Protection type: Shut down o/p voltage, re-power on to recover
Over Temperature	75°C±5°C (TSW1) Detect on heatsink of power transistor 85°C±5°C (TSW2) Detect on heatsink of power diode	
	Protection Type: Shut down o/p voltage, recovers automatically after temperature goes down	

Table 7-2: Power Supply Specifications

Description		Specification
<b>Output</b>	Module	RCP-1000-48
	Rack	RCP-1UI
	Output Voltage	48V
	Max. Output Current	63A
	Max. Output Power <b>Note 6</b>	3024W
<b>Input</b>	Voltage Range <b>Note</b>	90 ~ 264VAC    127 ~ 370 VDC
	Frequency Range	47 ~ 63Hz
	AC Current (Typ.) For Each Unit	11A/115VAC    5.5A/230VAC
	Leakage Current	<3.5mA / 230VAC
<b>Function</b>	Auxiliary Power	5V @ 0.3A
	Remote On/Off Control	By electrical signal or dry contact    ON:short    OFF:open
	Remote Sense	Compensate voltage drop on the load writing up to 0.5V. "Local Sense: should be connected in order to get the correct output voltage if the "Remote Sense" is not used
	DC Ok Signal	Open collector signal, on when $V_{out} \geq 80\% \pm 5\%$ , max. sink current:10mA
	AC Fail Signal	Open collector signal, refer to function manual
	Output Voltage Trim	Adjustment of output voltage, possible between 90 ~ 110% of rated output
	Over Temp Warning	Logic "High" for over temperature warning, refer to function manual
<b>Environment</b>	Working Temp.	-20 ~ +60°C (Refer to "Derating Curve")
	Working Humidity	20 ~ 90% RH non-condensing
	Storage Temp., Humidity	-40 ~ +85°C, 10 ~ 95% RH
	Temp. Coefficient	$\pm 0.02\%/^{\circ}\text{C}$ (0 ~ 50°C)
	Vibration	10 ~ 500 Hz, 2G 10 min./1 cycle, 60 min. each along X, Y, Z axes
<b>Safety &amp; Emc (Note 4)</b>	Safety Standards	UL60950-1, TUV WN60950-1 approved
	Withstand Voltage	I/P-O/P:3KVAC    I/P-FG:2KVAC    O/P-FG:0.7KVDC

Description		Specification
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH
	EMC Emission	Compliance to EN55022 (CISPR22) Class B, EN61000-3-2,-3
	EMC Immunity	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A
<b>Others</b>	Dimension	Rack 483.6*350.8*44(L*W*H)
	Packing	11Kg; 1pcs/11Kg/2.67CUFT

**NOTES:**

1. All parameters NOT specially mentioned are measured at 230VAC 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. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. Derating may be needed under low input voltages. Check the derating curve for more details.
6. Output of all the RCP-1000 modules are connected in parallel in the rack.
7. Under parallel operation of more than one rack connected together, the ripple of the output voltage may be higher than the SPEC at light load condition. It will go back to normal ripple level once the output load is more than 10%.

