ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

PWS1000R

Rackmount Power Supply

An ISO9001 and AS9100 Registered Company

Battery Chargers • Inverters • Power Supplies • Voltage Converters

8128 River Way, Delta B.C. V4G 1K5 Canada T. 604.946.9981 F. 604.946.9983 TF. 800.668.3884 (US/CANADA)

www.analyticsystems.com

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IMPORTANT & SAFETY INSTRUCTIONS

1. SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for this power supply
2. Do not expose this power supply to rain or snow.
3. Use of an attachment not recommended or sold by the power supply manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. Do not disassemble this power supply; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
5. To reduce risk of electric shock, unplug this power supply from the outlet before attempting any maintenance or cleaning. Turning off the controls will not reduce this risk.
6. O/P CONNECTION PRECAUTIONS

   Connect and disconnect DC output connections only after setting the I/P power switch to the off position.

GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS — The plug must be plugged into an outlet that is properly installed and grounded in accordance with al local codes and ordinances.

DANGER — Never alter AC cord or plug provided — if it will not fit outlet, have proper cord installed by a qualified electrician. Improper connection can result in a risk of an electric shock.

Analytic Systems does not recommend the use of the PWS1000R Series Power Supplies in life support applications where failure or malfunction of this product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness.

Analytic Systems does not recommend the use of any of its products in direct patient care. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as “critical” by the U.S. FDA.

Introduction

All new Current Mode switching design offers increased power and reliability in a compact package. Extra input and output filtering reduce EMI to extremely low levels. Reliability features include an input fuse, thermal shutdown, current limiting, reverse battery hookup protection and output short circuit shutdown with automatic recovery. The output voltage is easily adjusted 1.0 volts above or below the standard output voltage. An output overvoltage crowbar circuit protects devices connected to the converter. The PWS1000R Series Rack Mount Voltage Converter supplies either 12, 24 or 48 VDC from a 12, 24, or 48 VDC power source. Other input or output voltages up to 72 volts are also available by special order.

Specifications

Input Voltages		
Nominal (ip)	110Vac	220Vac
Actual	90 - 130Vac	180 - 260Vac
Input Amps (max)	13.2(12V) / 17(24/32/48V)	6.6(12V) / 8.5(24/32/48V)
Input Fuse (slow blow)	MDA-20(12V) / MDA-25(24/32/48V)	MDA-10(12V) / MDA-15(24/32/48V)

Output Voltages				
Nominal (op)	12Vdc	24Vdc	32Vdc	48Vdc
Actual	13.6 ± 0.05Vdc	27.2 ± 0.05Vdc	36.3 ± 0.05Vdc	54.4 ± 0.10Vdc
Adjust	± 1.0			
Output Crowbar	16.0 ± 0.5 Vdc	32.0 ± 1.0 Vdc	42.7 ± 1.3 Vdc	64.0 ± 2.0 Vdc
Output Amps (cont)	60	40	30	20
Output Amps (max)	70	45	34	22.5

General	
Input Frequency	45 - 65 Hz
Switching Frequency	60 ± 2 KHz
Idle Power	< 10 Watts
Noise on Input	< 50 milli-Volts
Noise on Output	< 50 milli-Volts
Transient Response	< 2V for 50% Surge (Output Amps/2)
Efficiency	> 80 % @ maximum output
Temp. Range	-25 to +40 deg. C @ maximum output
Isolation	Input-Output & Input-Case 1500 Vdc Output-Case 500 VDC (1500Vdc @ 48 V Out)
Dimensions	14.5 x 10.2 x 5.5 in / 36.8 x 25.9 x 14.0 cm
Clearance	1 Inch (2.5 cm) all around
Material	Marine Grade Aluminum
Finish	Black Powder Epoxy
Fastenings	18-8 Stainless
Weight	12 lb / 5.5 kg

* Specifications subjects to change without notice.

Designed and manufactured by: **ANALYTIC SYSTEMS WARE (1993) LTD.**

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Installation

MOUNTING

Mount the unit in a DRY location. Allow at least 4 inches of clearance around it for adequate cooling.

POWER CONNECTION

The unit is supplied with a 5 foot power cable. This should normally be adequate to connect to a source of power. If you must extend the power cable be sure to use a 3 conductor grounded type extension cable. For hard wiring to a source of power, cut off the plug, and strip the wires as necessary. The wire colours are

110 VAC	220 VAC
Brown - AC Hot	Brown - AC Hot / Phase 1
Blue - AC Neutral	Blue - AC Neutral / Phase 2
Green - Ground	Green/Yellow - Ground

All connections should be made inside an appropriate junction box. The maximum current draw from the 110 VAC supply is 14.6 amps, so a 20 amp circuit breaker should be used in the circuit panel and for a 220 VAC supply, 7.3 amps is the maximum current draw, so a 10 amp circuit breaker should be used in the circuit panel to feed power to the PWS1000R.

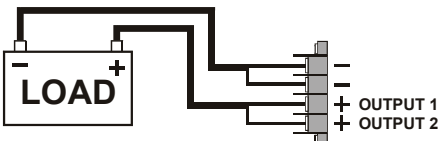
A ground stud is provided to bond the chassis to local ground to reduce or eliminate EMI.

OUTPUT CONNECTIONS

Two Positive output terminals and two Negative output terminals are provided. Connect only one wire to each terminal. Ensure that the total average load connected does not exceed the continuous current rating of the unit.

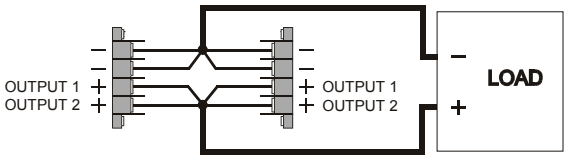
For 12Vdc Model Only!

For 12 Vdc models only, the output terminals must be connected as shown below if the load current is greater than 50 amps!



LOAD SHARE OPTION

The units may be configured for load sharing if they are equipped with the optional output isolation diodes. To confirm that your unit has these diodes, use an ohmmeter to measure the resistance between one of the positive output terminals and one of the negative terminals. If the diodes are present the terminals will measure as not connected. If the diodes are NOT present, the terminals will measure the static load resistance. Value depends on the output voltage of the unit. Assuming the output isolation diodes are present, connect one 4 foot piece of #14 AWG red wire to each positive output terminal. Connect all the positive wires to a distribution bus, or connect them together, and then connect from the common point to the load using the correct gauge of wire for the total output capability of all the supplies running in parallel. Repeat this process for the negative terminals using the same gauges of wire, but black in colour. These units should now load share. You can confirm this by watching the output ammeters. A slight difference is negligible, however, if this is not the case, you can increase the output voltage of the unit that is reading low using the output adjust potentiometer.



Output Fail Relay

The unit is equipped with a dry contact output fail relay. The contacts on the relay are accessed through a connector on the back of the unit.

Operation

Turn the switch on the top of the unit on to energize the outputs. The green indicator light will glow to indicate the proper operation of the unit.

Output Adjustment

The unit has an adjustment potentiometer to allow up to +/- 0.5V adjustment of the output voltage. This potentiometer is accessed through a small hole on the front plate of the voltage converter. As shipped from the factory, the unit is preset for a voltage of 13.6, 27.2, 36.3 or 54.4VDC. If you wish to adjust this voltage reach in with a very small flat blade screwdriver to rotate the potentiometer. Clockwise increases the output voltage and counter clockwise decreases it.

Meters

The unit comes equipped with a digital volt ammeter. The meter shows simultaneous voltage and current on either of the two output terminals. A toggle switch permits selection between the output terminals. The meter features bright red LED readouts to permit easy monitoring from many feet or meters away.

Troubleshooting

This unit provides LED indicators and a buzzer to help diagnose any problems. The unit should sound the buzzer to alert you prior to shutting itself down. You should immediately check the indicators to determine the cause of the shutdown.

CHARGING	Indicates that the battery charger is charging the batteries:
	If the LED is not on, the batteries may be fully charged and the charger is supplying a float voltage to the batteries to keep them fully charged.
LOW OUTPUT	Indicates that the output voltage is below normal because:
	The current demanded by the devices connected to the unit exceeds the maximum output current rating, causing the output voltage to drop to maintain the current at the maximum level,
	The input voltage is not high enough for unit to operate,
LOW INPUT	Indicates that the input voltage is below normal because:
	The input voltage is not in the correct range for proper operation of the unit.
OVERTEMP	Indicates that the Battery Charger is running too hot because:
	Too much power is being drawn, turn off or unplug some devices.
	The Battery Charger is located in a poorly ventilated area.

If the load exceeds the continuous rating for too long a period, the temperature sensor inside the unit will turn off the outputs. After the unit cools sufficiently, it will automatically come back on. If this happens frequently, remount the unit for increased airflow so it cools better.

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Limited Warranty

1. The equipment manufactured by Analytic Systems Ware (1993) Ltd. (the "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This warranty is in effect for:
    a. 3 Years from date of purchase by the end user for standard products offered in our catalog.
    b. 2 Years from date of manufacture for non-standard or OEM products
    c. 1 Year from date of manufacture for encapsulated products.
3. Analytic Systems will determine eligibility for warranty from the date of purchase shown on the warranty card when returned within 30 days, or
    a. The date of shipment by Analytic Systems, or
    b. The date of manufacture coded in the serial number, or
    c. From a copy of the original purchase receipt showing the date of purchase by the user.
4. In case any part of the equipment proves to be defective, the Purchaser should do the following:
    a. Prepare a written statement of the nature of the defect to the best of the Purchasers knowledge, and include the date of purchase, the place of purchase, and the Purchasers name, address and telephone number.
    b. Call Analytic Systems at 800-668-3884 or 604-946-9981 and request a return material authorization number (RMA).
    c. Return the defective part or unit along with the statement at the Purchasers expense to the Warrantor; Analytic Systems Ware (1993) Ltd., 8128 River Way, Delta, B.C., V4G 1K5, Canada.
5. If upon the Warrantor's examination the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense by the most economical means. Requests for a different method of return or special handling will incur additional charges and are the responsibility of the Purchaser.
6. Analytic Systems reserves the right to void the warranty if:
    a. Labels, identification marks or serial numbers are removed or altered in any way.
    b. Our invoice is unpaid.
    c. The defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.
7. No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so.
8. Only the Warrantor shall perform warranty service. Any attempt to remedy the defect by anyone else shall render this warranty void.
9. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically stated to be waterproof.
10. No other express warranty is hereby given and there are no warranties that extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.
11. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof.
12. The Warrantor assumes no liability for incidental or consequential damages of any kind

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