



# ANALYTIC SYSTEMS

Power Conversion Solutions

## INSTALLATION & OPERATION MANUAL

### IPS300 SERIES Pure-Sine Inverter



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)

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**ANALYTIC SYSTEMS**  
Power Conversion Solutions

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## IMPORTANT & SAFETY INSTRUCTIONS

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1. SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for inverter.
2. Do not expose inverter to rain or snow.
3. Use of an attachment not recommended or sold by the inverter manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. Do not disassemble inverter; 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 inverter from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
6. Never place inverter directly above battery; gases from battery will corrode and damage inverter.
7. Never allow battery acid to drip on inverter when reading gravity or filling battery.

**GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS** — Inverters should be grounded to reduce risk of electric shock. Inverter is equipped with electric receptacles capable of accepting an equipment-grounding conductor and a grounding plug.

**DANGER:** Never alter AC cord or plug provided — if it will not fit the 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 IPS300 Series Pure Sine Inverters 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

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Computers are moving into non-traditional work areas at an ever increasing rate as more and more specialty software packages become available. However there is a major problem. Computers require clean, pure AC power to work reliably. If you power one from the same Genset that runs your heavy loads, you could damage it from surges and spikes generated by switching those loads. If you power it from the same Inverter that runs a microwave and other electrical devices, similar problems occur, plus voltage dropouts from excessive loads on the inverter add to the problem. Also, most inverters produce 'Quasi-Sine Wave' AC, which often doesn't run computers very well. Complaints of noisy displays, cursors that move by themselves and more abound.

The Model IPS300 Watt 'Pure Sine Wave' Inverter is designed specifically for running computers, high end audio, home theatre and similar equipment.

### FEATURES

- 'Pure Sine Wave' 120 VAC / 60 Hz fully regulated output, exactly the same as household AC.
- Crystal controlled for precise frequency ( $\pm 0.01$  Hz).
- 300 Watts output power sufficient for a complete computer workstation including processor, monitor and printer (except laser printers).
- State of the art MosFet technology and unique Soft-Start circuitry for reliable operation.
- Illuminated ON-OFF switch for positive indication of proper operation.
- Heavy input filtering to shield other devices sharing the same battery.
- Transformer type output to protect computers and other sensitive equipment from surges and spikes.
- Low voltage warning and shutdown circuitry to protect the batteries.
- Ground fault interruption protection to protect the user against possible electric shock caused by faulty equipment plugged into the inverter.
- Over voltage and over temperature warning and shutdown circuitry to protect the inverter.
- LED indicators and a buzzer to bring attention to the cause of the shutdown.
- One standard 2 outlet AC receptacle for easy connections.
- Versions are available for 12, 24, and 32 volt battery systems.
- Three year parts and labour warranty.
- Adjustable power save mode reduces output current when the load drops below a user set level.



# Specifications

Input Voltages			
Nominal (ip)	12	24	32
Actual (Vdc)	10.5 - 16	20 - 30	30 - 40
Input Amps (max)	48	25	17
Input Fuses (ATC)	2 x 30A	30A	20A

Output Voltages		
Nominal (op)	110	220
Actual (Vac)	115 ± 5 rms	225 ± 5 rms
Output Amps (max)	2.5 cont. / 3.33 peak	1.36 cont. / 1.82 peak
Output Frequency	60 ± 0.01 Hz	50 ± 0.01 Hz
Output Type	Pure Sine Wave	
Output Distortion	< 5% at 300 Watts Out into 0.8 power factor load	

General	
Efficiency	> 80% @ maximum output
Temp Range	-25 to +40 deg C @ maximum output
Isolation	1500 VDC Input to Output & Output to Case 500 VDC Input to Case
Dimensions	10.7 x 7.7 x 5.2 in / 27.2 x 19.6 x 13.2 cm
Clearance	1.0 in / 2.5 cm
Material	Marine Grade Aluminum
Finish	Black Powder Epoxy
Fastenings	18-8 Stainless Steel
Weight	12.0 lb / 5.5 kg
Safety	ABS 11-HS794404D-PDA

\* Specifications subjects to change without notice.

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

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# Installation

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## **MOUNTING**

Mount the unit in a DRY location. Mount the unit in a ventilated area. Allow at least 1 inch of clearance around the unit for adequate cooling. If the unit is to be mounted vertically, it is recommended that the unit be mounted with the exhaust fan at the top. This will allow the hot air to exhaust out of the top of the unit.

It is NOT recommended that the unit be secured until it has been tested under the intended load.

## **CAUTION**

Do not mount the unit where explosive gases may accumulate as a slight arc may occur when the power leads are connected, and in the unlikely event of a failure, sparks may be generated inside the unit.

## **POWER CONNECTION**

Use a voltmeter to measure the input voltage to ensure the voltage of the battery is within the Input Voltage range printed on the front of the unit.

The unit is supplied with two 5 foot power cables. This should be adequate to connect to a power source.

Connect the wires as follows:



## **CAUTION**

Do Not Reverse Connect the Input Wires. This will cause serious Damage to the Inverter and will not be covered by Warranty.

If you must extend the cable:

- Use the smallest extension length possible.
- Use at least AWG 8 gauge conductors.
- Splice and solder the joint.
- Protect the joints with heat shrink tubing.

Before plugging any devices into the unit, turn it on. If the power switch is illuminated, the unit is working properly.



## **OUTPUT CONNECTIONS**

One standard AC receptacle is provided for connection of up to two devices. Ensure that the total average load does not exceed the continuous current rating of the unit.

### **CAUTION**

Do not apply AC voltage to the outlet. Damage caused by this action will not be covered under warranty.

## **Operation**

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Turn the switch on the front of the unit on to energize the outputs. The switch will glow to indicate the presence of AC power at the receptacles.

### **POWER SAVE**

The Power Save feature allows the user to set the level at which the unit goes into the Power Save mode. The Power Save mode adjustment is accessed on the front of the unit. A small flat bladed instrument screwdriver is used to make the adjustment.

Turning the potentiometer fully counter clockwise forces the Power Save mode to off. This means that the inverter will continue to output 120VAC even if there is no devices connected to it. Turning the potentiometer clockwise will set the level at which the Power Save mode will operate.

The unit is internally set to come back on at 40 watts. This means that once the unit has gone into the Power Save mode, the load must be at least 40 watts for the unit to come back on.

When the standby light on the front of the inverter is lit, the unit is in the Power Save mode.



# Troubleshooting

Indicates that the battery voltage is below normal because:

## **LOW VOLTAGE**

- The battery needs to be recharged,
- The battery voltage is not compatible with the inverter.

Indicates that the inverter is running too hot because:

## **OVER TEMP**

- Too much power is being drawn, turn off or unplug some devices.
- The inverter is located in a poorly ventilated area.

Indicates that the load is trying to draw more current than the inverter can supply:

## **OVER LOAD**

- Too much power is being drawn, turn off or unplug some devices.

Indicates that a short circuit has occurred at the inverter output:

## **SHORT CIRCUIT**

- Turn off the inverter. Disconnect all devices from the inverter and clear the short before reconnecting devices to the inverter.

Indicates that the inverter has detected a ground fault and has shut itself down to prevent a possible electric shock to the user. This could be caused by dampness, faulty mechanism, worn insulation, etc

## **GROUND FAULT**

- Turn the inverter off. Have a qualified person determine the reason for the ground fault and correct the problem.

Indicates that the inverter has gone into the Power Save mode.

## **STANDBY**

Indicates the output voltage has risen above the specified output range and the inverter has shut itself down to prevent damage to the equipment plugged into it.

## **LOW VOLTAGE & OVER TEMP**

- The inverter has an internal fault and must be returned to the factory for repair.

## **TROUBLE SHOOTING CHECKLIST**

- Use a voltmeter to measure the input voltage. The input should match the rating printed on the unit.
- Ensure that the battery is connected correctly: Red to Positive, Black to Negative.
- Check the specifications of the load to see what power it consumes and test it from a standard wall outlet.
- Unplug all devices connected to the unit and turn it on.
- Make a note of any LED's that stay on.
- Ensure that the Power Save mode is not activated.
- If the unit cycles on and off, check and see if the standby light comes on when the unit is off. If so, the Power Save mode is set too close to the recovery (40 watts) load. Adjust the Power Save mode in accordance with the previous instructions.
- Disconnect the input power and remove the cover. Check the automotive type fuses (ATC) which are visible at the top of the circuit board. If any are blown, replace all of them with the correct value shown in the specifications and on the label.



## DEFECTS OR DAMAGE

If after checking all of the above, the problem persists, you may assume the unit is defective or damaged and it must be returned for repair.

## Remote Control Option

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**IMPORTANT:** This remote is to be used only on Inverters manufactured by Analytic Systems.

A remote control panel may be connected to the inverter using a 9-pin D-connector, which attaches to the front panel of the inverter. The remote control panel and D connector are part of the remote control option. The remote control panel allows the unit to be operated remotely as well as duplicating all the diagnostic indicators and audible alarm.

## REMOTE CONNECTOR

This connector is located on the front of the unit. Important: To prevent the possibility of High Voltage Electrical Shock, do not power up the Inverter unless all wiring from the unit to the remote is securely connected. Do not remove the dust cover from the DB-9 connector if the remote is not being used.



## **Special Services & Options**

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<b>Conformal Coating</b>	INCLUDED ON ALL UNITS UNLESS REQUESTED NOT TO as of April 1, 2014
<b>Option "c"</b>	Ruggedization Package (EXTRA Conformal Coating and RTV Compound)
<b>Option "v"</b>	Marine / Industrial Pkg (EXTRA Conformal dipping and RTV Compound)
<b>Option "MS"</b>	Military Pkg (incl. Wide Temp Components, Conformal Dipping and RTV Compound)
<b>Option "w"</b>	Wide Temperature Operation (-40 to +55 C, incl)
<b>Option "SM"</b>	High Voltage Protection on the DC Input Side
<b>Option "d"</b>	Paralleling Diodes
<b>Option "FI"</b>	Forklift Modifications
<b>Option "F"</b>	Open Frame - No chassis just heat sink bars (not for all products)
<b>Special Input</b>	There is no charge for nominal output voltages (ie. 12.0, 24.0, 48.0), but this
<b>Special Output</b>	must be noted at the time of order (Contact Factory for details)
<b>Water tight options</b>	IP66, IPS67, IPS68

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## Limited Warranty

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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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