ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

IPS600 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)

www.analyticsystems.com

ANALYTIC SYSTEMS
Power Conversion Solutions

IMPORTANT & SAFETY INSTRUCTIONS

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 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 IPS600 Series 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

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 IPS600 Series 600 Watt 'True Sine Wave' Inverter is designed specifically for running computers and their related equipment.

FEATURES

- 'Pure Sine Wave' 115 VAC / 60 Hz or 220 VAC / 50 Hz fully regulated output, exactly the same as commercial AC.
- Crystal controlled for precise frequency (± 0.01 Hz).
- 600 Watts output power sufficient for a complete computer workstation.
- 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.
- Over voltage and over temperature warning and shutdown circuitry to protect the inverter.
- Short circuit protection.
- LED indicators and a buzzer to bring attention to the cause of the shutdown.
- An output that connects to a computer to warn the user of impending shutdown.
- Two AC receptacles for easy connection of up to four devices.
- Versions are available for 12, 24, and 32 volt battery systems.
- Optional line detect feature available for operation as an 'off-line' UPS.
- Three year parts and labour warranty.

Specifications

Input Voltages		
Nominal (op)	12Vdc	20Vdc
Actual	10.5 - 16Vdc	20 - 40Vdc
Input Amps (max)	107	57
Input Fuses (ATC)	40 Amp x 3	20 Amp x 4
Output Voltages		
Nominal (op)	110Vac	220Vac
Actual (VAC)	115 ± 5Vac	220 ± 10Vac
Output Amps (cont)	5.0	2.5
Output Amps (max)	7.5	3.7
Output Frequency	60.00 ± 0.01 Hz	50.00 ± 0.01 Hz
Output Type	Pure Sine Wave	
Output Distortion	< 5% at 1000 Watts into 0.8 power factor load	

General	
Efficiency	> 80 % @ maximum output
Temp. Range	-25 to +40 deg. C @ maximum output
Isolation	Input-Output & Output-Case 1500VDC Input-Case 500VDC
Length	13.0 in / 33.0 cm
Width	9.0 in / 22.9 cm
Height	7.8 in / 19.8 cm
Clearance	1 Inch (2.5 cm) all around
Material	Marine Grade Aluminum
Finish	Black Powder Epoxy
Fastenings	18-8 Stainless
Weight	22 lb / 10.0 kg

** Actual startup is at 22, 42, or 67Vdc Input, depending on model

* This is Analytic Systems' suggested range. Please consult your battery manufacturer for their recommendations.

* Specifications subjects to change without notice.

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

8128 River Way
Delta, BC V4G 1K5 Canada

p. 604.946.9981 f. 604.946.9983
tf. 800.668.3884 US/Canada

www.analyticsystems.com
analyticinfo@analyticsystems.com

Revised July 2014

Installation

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.

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

CAUTION: The case of the inverter is connected to AC Ground and AC Neutral to meet regulatory requirements and to reduce the possibility of it generating any radio frequency interference. The case must be bonded appropriately to the grounding system of the vehicle or marine vessel. On a vehicle bond the case to the frame and on a marine vessel bond the case to the hull. A grounding stud is provided on the front of the inverter for this purpose. To ensure proper grounding, check the connection with an ohmmeter.

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 High-Voltage and Low-Voltage alarm setpoints are now infinitely adjustable between the minimum and maximum allowable input voltages for these inverters.

The adjustment is made by using a small flat-blade screwdriver to turn the potentiometer which is accessible through the HI-LO switch opening on the front of the inverter. Setting the potentiometer fully counter-clockwise sets the low and high voltage alarms to their lowest settings. Turning the potentiometer fully clockwise sets the low and high voltage alarms to their highest settings.

If the voltage alarm goes off during normal operation, first confirm that the battery voltage is within the normal range for your battery system. If it is, then adjust the alarm setpoints by turning the potentiometer slightly clockwise if the Low Battery alarm is ON, or counter-clockwise if the High Battery alarm is ON.

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: Red - Positive | Black- Negative

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

f you must extend the cable:

- Use the smallest extension length possible.
- Use at least AWG 4 gauge conductors.
- Splice and solder the joint.
- Protect the joints with heatshrink tubing.

Before plugging any devices into the unit, turn it on.

If the power switch is illuminated, the unit is working properly.

OUTPUT CONNECTIONS

Two standard AC receptacles are provided. Ensure that the total average load connected does not exceed the continuous current rating of the unit.

CAUTION: Do not apply AC voltage to the outlets. Damage caused by this action will not be covered under warranty. An optional line input detect modification is available for UPS operation. Consult your local representative.

An optional AC output cable modification is available for hardwiring to a load. Consult your local representative for information on the modification and to specify a cable length and termination.

LINE DETECT CONNECTION

Plug the optional LINE IN cable into a standard 110 VAC wall outlet.

The inverter will operate in Standby as long as power is available from the wall to run the load. If there is a power failure, or the voltage falls below 98 VAC, the inverter will switch on within a few AC cycles and take over supplying power to the load. The inverter will wait twenty seconds after the power is restored before returning to Standby.

A separate battery charger is required for UPS operation. Plug the battery charger into the wall, NOT the inverter.

DISCONNECTION

If you disconnect the unit to remove it for service or storage, turn the power switch on for at least one minute after it has been disconnected from it's input power source to discharge the storage capacitors.

Operation

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.

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.

STANDBY	Indicates that the unit circuitry deemed it necessary to shut down.
	One of the causes listed below has reached a critical level,
	The optional line input is energized.
LOW VOLT	Indicates that the output voltage is below normal because:
	The battery needs to be recharged,
	The battery voltage adjustment potentiometer on the inverter is set incorrectly,
	The battery voltage is not compatible with the inverter.
OVER VOLT	Indicates that the battery voltage is above normal because:
	The charging system may be faulty,
	The battery voltage adjustment potentiometer on the inverter is set incorrectly,
	The battery voltage is not compatible with the inverter.
OVERTEMP	Indicates that the inverter is running too hot because:
	Too much power is being drawn, turn off or unplug some devices.
	The inverter is located in a poorly ventilated area.
LOW VOLT & OVER VOLT	Indicates that the inverter output is shorted or nearly shorted because:
	A short circuit exixts at the output,
	The inverter is severely overloaded.

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.

TROUBLE SHOOTING CHECKLIST

1. Use a voltmeter to measure the input voltage. The input should match the rating printed on the unit.
2. Check that the battery voltage adjustment potentiometer on the front of the unit is set for the measured input voltage.
3. Ensure that the battery is connected correctly: Red to Positive, Black to Negative.
4. The large (+) and (-) markings on the case are more reliable than the colors of the cable.
5. Check the specifications of the load to see what power it consumes and test it from a standard wall outlet.
6. Unplug all devices connected to the unit and turn it on.
7. Make a note of any LED's which stay on.

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

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.

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

REMOTE CONNECTOR

This connector is located on the side 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

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

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

ANALYTIC SYSTEMS
Power Conversion Solutions

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