



ANALYTIC SYSTEMS

Power Conversion Solutions

Installation & Operation Manual

FCA250 & FCA500

FREQUENCY CONVERTER



IMPORTANT & SAFETY INSTRUCTIONS

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

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

Analytic Systems does not recommend the use of the FCA250 & FCA500 Frequency Converter 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

The FCA250 & FCA500 frequency converter series were designed electrically and mechanically to achieve optimal ruggedness required for industrial, telecommunications, military and airborne applications.

Electrical Connections

The input can be grounded either on the positive or negative, or may be left floating. The output is normally grounded, although it can be floating if required.

The input connections are via a 3-pole terminal block. GND, PH and N are clearly labeled. The output connections are via a standard North American receptacle (other input/output options available).

All connections should follow NEC standards.

Location

The unit should be mounted securely to a flat surface with a minimum of one-inch clearance to provide ample airflow and to achieve maximum continuous power. Cooling is enhanced if the unit is installed on a metal surface to allow for additional conduction cooling.

ON/OFF Switch

The FCA250 & FCA500 frequency converter series have an ON/OFF switch which disables the converter's control circuit. Turning the switch to the 'OFF' position cuts the power to the AC output. A minimum current drain will continue on the input side.

Electronic Protection

The frequency converter has a number of protection circuits designed to provide full electronic protection:

Grounding – The input can be either positively or negatively grounded, or may be left floating. The output is normally floating, although it can be grounded.

Thermal shutdown – In the event of overheating due to high ambient temperatures, blocked airflow or overload conditions, the internal thermal protection circuit will shut the unit down. Operation will automatically resume when the temperature reaches the specified operating level.

Overload and short-circuit protection – In case of an overload or short circuit, the converter will go into "hiccup" mode. This means that the unit will automatically shut down and will periodically test whether or not the overload condition still exists.

Input and output filtering – All FCA250 & FCA500 series frequency converters have a double stage input filter to restrict EMI emissions. Filtering also provides immunity against voltage spikes and other disturbances on the input power line. The converters meet FCC 20780 Class B and EN 55022 Class B conducted emission requirements.

Operating

Before plugging any appliance into the frequency converter, please refer to its power requirements. Power requirements are indicated in watts (W), volt-amps (VA) or amps (A). Ensure that the rating does not exceed the frequency converter's capacity.

Safety Considerations

WARNING:

The FCA250 & FCA500 series frequency converters generate 115VAC (or 230VAC) power – the same voltage coming out of a standard wall outlet. This voltage can be hazardous and has to be treated with the same caution as with a regular electrical outlet.

As with any other electrical equipment, the frequency converter must be protected from water and moisture at all times.

Specifications

FCA250

INPUT	
Input Voltage:	115/230 VAC +/- 20%, auto-ranging, 47 to 410Hz
Input Protection:	Inrush current limiting & thermal fuse
Input Isolation:	2250 Vdc input to output, input to chassis & output to chassis
RFI Suppression:	Meets requirements of FCC 20780 Class B and EN55022 Class B conducted emissions as a minimum
OUTPUT	
Output Voltage / Current:	115 VAC / 60 Hz / 2.1 Amp continuous (250 Watts) 230 VAC / 50 Hz / 1.05 Amp continuous or any combination including frequency up to 400Hz
Wave Form:	Sinusoidal
Total Harmonic Distortion:	Better than 5% at full load
Line Regulation:	Maximum 0.5%
Load Regulation:	Maximum \pm 6% from 10% load to full load
GENERAL	
Temperature Drift:	0.05% per ° C over operating temperature range
Operating Temp. Range:	0° C to +50° C for full specification (no fan)
Humidity:	5 - 95 % non-condensing
Output Protection:	Current limiting with short-circuit protection. Thermal shutdown with automatic recovery in case of continuous overload or insufficient airflow
Output Overload Protection:	Hiccup at 300 W
Output Over-voltage Protection:	By internal supply voltage limiting at 120% V out, nominal level
Load Crest Factor:	Maximum 2.5 at 90% load
Efficiency:	Minimum 78% at full load
Cooling:	By convection / conduction
Input Connection:	Screw-type terminal block
Output Connection:	Standard AC Receptacle (North American Type)
Package Size / Weight:	5.0 x 5.3 x 15.5 Enclosed case, 9 pounds (4.1 kg)

FCA500

INPUT	
Input Voltage:	115/230 VAC +/- 20%, auto-ranging, 47 to 410Hz
Input Protection:	Inrush current limiting & thermal fuse
Input Isolation:	2250 Vdc input to output, input to chassis & output to chassis
RFI Suppression:	Meets requirements of FCC 20780 Class B and EN55022 Class B conducted emissions as a minimum
OUTPUT	
Output Voltage / Current:	115 VAC / 60 Hz / 4.4 Amp continuous (500 Watts) 230 VAC / 50 Hz / 2.2 Amp continuous or any combination including frequency up to 400Hz
Wave Form:	Sinusoidal
Total Harmonic Distortion:	Better than 5% at full load
Line Regulation:	Maximum 0.5%
Load Regulation:	Maximum \pm 6% from 10% load to full load
GENERAL	
Temperature Drift:	0.05% per °C over operating temperature range
Operating Temp. Range:	0° C to +50° C for full specification (no fan)
Humidity:	5 - 95 % non-condensing
Output Protection:	Current limiting with short-circuit protection. Thermal shutdown with automatic recovery in case of continuous overload or insufficient airflow
Output Overload Protection:	Hiccup at 600 W
Output Over-voltage Protection:	By internal supply voltage limiting at 120% V out, nominal level
Load Crest Factor:	Maximum 3.0 at 90% load
Efficiency:	Minimum 78% at full load
Cooling:	By internal fan
Input Connection:	Screw-type terminal block
Output Connection:	Standard AC Receptacle (North American Type)
Package Size / Weight:	5.0 x 5.3 x 15.5 Enclosed case, 9 pounds (4.1 kg)

* Specifications subjects to change without notice.

Designed and manufactured by: ANALYTIC SYSTEMS WARE (1993) LTD.
 8128 River Way, Delta, B.C., V4G 1K5, Canada
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Limited Warranty

1. The equipment manufactured for 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: 2 Years from date of Purchase.
3. 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., V4G1K5, Canada.
4. 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.
5. Analytic Systems reserves the right to void the warranty if:
 - a. Identification marks or serial numbers are removed or altered in any way.
 - b. Our invoice is unpaid.

The defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.
6. 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.
7. Only the Warrantor shall perform warranty service. Any attempt to remedy the defect by anyone else shall render this warranty void.
8. 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.
9. 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.

10. 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.

11. The Warrantor assumes no liability for incidental or consequential damages of any kind.



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