



Avionic Instruments Inc. (AI[®]) Frequency Converters have been used in military and commercial, airborne, ground, and shipboard applications since the early 1980s.

Frequency converter products use a combination of very high frequency switching and current mode control to produce a highly regulated and robust source of AC power. Power ratings are conservative, providing high overloads for electronic equipment that require high start-up currents, repetitive sub-cycle peak currents, and a well-regulated distortion free waveform.

Two levels of power are available with output frequencies of 50, 60, or 400Hz. The Mid Power Converter Series provides single phase or three phase power from 1000VA to 12KVA. The High Power Series provides single or three phase power from 2KVA to 42KVA.



Three phase system outputs operate with accurate phase displacement for any combination of unbalanced loading. Proportional current sharing is maintained under all load conditions for units operated in parallel.

Frequency converters use a two-stage power processing topology that includes an input AC to DC transformer rectifier (TRU) and an output DC to AC bridge inverter switching at a very high frequency. Each power stage operates independently. The input AC to DC TRU provides overall device isolation, and supplies the bridge inverter with high voltage DC. The DC to AC bridge inverter, in turn, synthesizes an accurate output sinewave at either 115VAC or 230VAC, and at other international voltages. Fourth generation current mode control, refined and field proven over the past thirty years, is used to provide excellent line and load regulation. The output responds to sudden load changes and sub-cycle peak current demands within microseconds, assuring a stable output, free of load damaging voltage spikes and transients.

AI[®] frequency converters exhibit superior compatibility with aircraft generators and associated Generator Control Units (GCUs). The circuit architecture includes an electronically

processed twelve pulse rectification scheme with trap filtering, ensuring a high power factor and exceptionally low reflected current harmonics at the input power source.

Frequency converters are designed for stringent military and high reliability commercial applications. In particular, converters are used within airborne medical installations where high reliability is essential. AI[®] frequency converters have an OEM installed user base within the vast majority of VIP and executive aircraft installations around the world.

Designs use military style, FAA-approved components for safe operation over the -55 degrees C to +71 degrees C temperature range. Products are subjected to an extended operational power burn-in and vibration screening prior to acceptance and shipment. Military variants, available for any standard product, are subjected to high levels of Environmental Stress Screening (ESS), ensuring reduced infant mortality and increased long-term field reliability for mission critical applications.

Consult your AI[®] Sales Associate for more information.



GENERAL PERFORMANCE SPECIFICATIONS

ELECTRICAL PERFORMANCE

INPUT VOLTAGE

Three Phase WYE
190 to 210 VAC L-L

INPUT FREQUENCY

380 to 420 Hz Nominal
324 to 700 Hz Normal

OUTPUT VOLTAGE

115 VAC +/- 2.0% or
230 VAC +/- 2.0%

OUTPUT FREQUENCY

50 Hz +/- 1% or
60 Hz +/- 1% or
400 Hz +/- 1%

OUTPUT POWER

1000VA to 42000VA

OVERLOAD

110% for 2 Hours
125% for 5 Minutes
200% Short Circuit Current

OUTPUT WAVEFORM

Sinewave THD < 2%
Crest Factor 1.41 +/- 0.04
DC Content < 0.1 VDC

EFFICIENCY

85% Typical

OUTPUT POWER FACTOR

0.75Lag to 0.8 Lead
Not Damaged by Any Power Factor

DESIGN STANDARDS

RTCA DO-160 Environmental
Conditions for Airborne
Electronic Equipment

Mil-Std-704 Aircraft Electric
Power Characteristics

Mil-Std-5400 Aircraft
Electronic Equipment

Mil-Std-454 General Requirements
for Electronic Equipment

Mil-Std-217 Reliability

Mil-B-5087B Electrical Bonding

Mil-Std-130 U.S. Military
Identification Marking

FAR-25 Federal
Aviation Regulations

JAR-25 Joint
Airworthiness Regulations

Mil-Std-810 Environmental
Standards and General
Requirements

Mil-Std-461 Electromagnetic
Interference Characteristics

Mil-Std-1399 Interface Standard
for Shipboard Electrical Systems

ISO 9001 Quality System

QUALIFICATION

-55° to +71° C
Operational Temperature

65° to +85° C
Storage Temperature

Temperature Shock

Severe Humidity

High Altitude

Shock

Random and Sinusoidal Vibration

Acceleration

Explosion

Sand & Dust

Fungus Resistance

Salt Spray

Magnetic Effect

Power Input

Electromagnetic Interference

Lightning

Dielectric Strength

Insulation Resistance

Bonding & Grounding

FEATURES

Military Temperature
Range Components

MTBF > 75000 Hours

300 Microsecond Response Time

Current Controlled Modulation

12 Pulse Rectification Scheme

Parallel, Three Phase and Phase
Lock Capability

Remote On/Off

Fault Bit

Military Grade Fan

Environmental Stress Screening

Low Cost

30-Month Warranty

NSN and GSA Listed Models

PROTECTION

Input Over/Under Voltage

Input Over/Under Frequency

Loss of Phase

Output Over Voltage

Output Over/Under Frequency

Output DC Offset

Thermal Shutdown

Short Circuit



MODEL NUMBER INDEX

Model	Power (VA)	Output (VAC)	Frequency (Hz)	Output Phase(s)	Size (see outline index)	Weight (lbs.)	Input Breaker	ESS	Parallel and Three Phase Operation	Reverse Remote
4A1000-1HP-100	870	100	60	1	A	15.5	✓			
4A1000-1HCP	1000	115	60	1	A	15.5			✓	
4A1000-1HP	1000	115	60	1	A	15.5	✓			
4B2000-2E-CM-100-1614	2000	100	60	1	E	37.0	✓			
4A2000-1B-1-HRCP	2000	115	60	1	B	44.0				
4A2000-1B-1-HRP	2000	115	60	1	B	44.0	✓			
4B2000-1A-CM-1649	2000	115	60	1	E	37.0	✓			
4B2000-1A-NB-1078	2000	115	60	1	E	37.0		✓		
4B2000-2E-NB-1079	2000	115	60	1	E	37.0		✓	✓	
4B2000-2E-NB-CM-1084	2000	115	60	1	E	37.0			✓	
4B2000-2E-NB-RR-1702	2000	115	60	1	E	37.0		✓	✓	✓
PL2000-4AP	2000	115	60	1	A-SYS	31.0				
4C2000-1A-1955	2000	115	60	1	F	19.5	✓			
4C2000-1A-NB-1956	2000	115	60	1	F	19.5				
4C2000-1B-1957	2000	230	60	1	F	19.5	✓			
4C2000-1B-NB-1958	2000	230	60	1	F	19.5				
4A2000-1D-1-HRP-1058	2000	230	60	1	B	44.0	✓			
4B2000-2H-CM-841	2000	230	60	1	E	37.0	✓			
4B2000-2H-NB-1081	2000	230	60	1	E	37.0		✓	✓	
4B2000-2H-NB-CM-1086	2000	230	60	1	E	37.0			✓	
SR2000-4AP	2000	230	60	1	A-SYS	31.0				
4A3000-1B-HRP	3000	115	60	1	C	61.0	✓			
PL3000-4AP	3000	115	60	1	A-SYS	46.5				
3PH3000-4AP	3000	115/200	60	3	A-SYS	46.5				
4A3000-1C-HRP	3000	115/200	60	3	C	61.0	✓			



MODEL NUMBER INDEX

Model	Power (VA)	Output (VAC)	Frequency (Hz)	Output Phase(s)	Size (see outline index)	Weight (lbs.)	Input Breaker	ESS	Parallel and Three Phase Operation	Reverse Remote
4B3500-1A-100-825	3040	100	60	1	E	43.0	✓	✓		
4B3500-1A-NB-100-1071	3040	100	60	1	E	43.0		✓		
4B3500-2E-NB-100-1089	3040	100	60	1	E	43.0		✓	✓	
4B3500-2E-NB-CM-100-1549	3040	100	60	1	E	43.0			✓	
4B3500-1A	3500	115	60	1	E	43.0	✓	✓		
4B3500-1A-CM-770	3500	115	60	1	E	43.0	✓			
4B3500-1A-NB-907	3500	115	60	1	E	43.0		✓		
4B3500-1A-NB-CM-910	3500	115	60	1	E	43.0				
4B3500-2E-NB-1607	3500	115	60	1	E	43.0		✓	✓	
4B3500-2E-NB-CM-1600	3500	115	60	1	E	43.0			✓	
4B3500-2E-NB-RR-1616	3500	115	60	1	E	43.0		✓		✓
4C3500-1A-1943	3500	115	60	1	F	23.5	✓			
4C3500-1A-NB-1959	3500	115	60	1	F	23.5				
4B3500-2H-220-1594	3500	220	60	1	E	43.0	✓	✓		
4C3500-1B-1960	3500	230	60	1	F	23.5	✓			
4C3500-1B-NB-1961	3500	230	60	1	F	23.5				
4B3500-2H-NB-1074	3500	230	60	1	E	43.0		✓	✓	
4B3500-2H-NB-CM-1068	3500	230	60	1	E	43.0			✓	
4B3500-2H-NB-CM-RR-1447	3500	230	60	1	E	43.0			✓	✓
4B3500-2H-NB-RR-1446	3500	230	60	1	E	43.0		✓	✓	✓
4A4000-1B-HRP	4000	115	60	1	D	72.0	✓			
PL4000-4AP	4000	115	60	1	A-SYS	62.0				
PL4000-4B-2E-846	4000	115	60	1	E-SYS	74.0		✓		
PL4000-4B-2E-CM-1107	4000	115	60	1	E-SYS	74.0				
PL4000-4C-2E-854	4000	230	60	1	E-SYS	74.0		✓		



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Model	Power (VA)	Output (VAC)	Frequency (Hz)	Output Phase(s)	Size (see outline index)	Weight (lbs.)	Input Breaker	ESS	Parallel and Three Phase Operation	Reverse Remote
PL4000-4C-2E-CM-1115	4000	230	60	1	E-SYS	74.0				
SP4000-4AP	4000	230	60	1	A-SYS	62.0				
PL6000-4B-2E-849	6000	115	60	1	E-SYS	111.0		√		
PL6000-4B-2E-CM-1110	6000	115	60	1	E-SYS	111.0				
PL6000-4C-2E-856	6000	230	60	1	E-SYS	111.0		√		
PL6000-4C-2E-CM-1117	6000	230	60	1	E-SYS	111.0				
3PH6000-4AP	6000	115/200	60	3	A-SYS	93.0				
3PH6000-4B-2E-875	6000	115/200	60	3	E-SYS	111.0		√		
3PH6000-4B-2E-CM-1137	6000	115/200	60	3	E-SYS	111.0				
3PH6000-4B-2H-1090	6000	230/400	60	3	E-SYS	111.0		√		
3PH6000-4B-2H-CM-1139	6000	230/400	60	3	E-SYS	111.0				
PL7000-4B-2E-1618	7000	115	60	1	E-SYS	86.0		√		
PL7000-4B-2E-CM-1122	7000	115	60	1	E-SYS	86.0				
PL7000-4C-2E-833	7000	230	60	1	E-SYS	86.0		√		
PL7000-4C-2E-CM-1130	7000	230	60	1	E-SYS	86.0				
PL8000-4B-2E-852	8000	115	60	1	E-SYS	148.0		√		
PL8000-4B-2E-CM-1113	8000	115	60	1	E-SYS	148.0				
PL8000-4C-2E-858	8000	230	60	1	E-SYS	148.0		√		
PL8000-4C-2E-CM-1119	8000	230	60	1	E-SYS	148.0				
SP8000-4AP	8000	230	60	1	A-SYS	124.0				
3PH9000-4AP	9000	115/200	60	3	A-SYS	140.0				
PL10500-4B-2E-864	10500	115	60	1	E-SYS	129.0		√		
PL10500-4B-2E-CM-1620	10500	115	60	1	E-SYS	129.0				
PL10500-4C-2E-870	10500	230	60	1	E-SYS	129.0		√		
PL10500-4C-2E-CM-1132	10500	230	60	1	E-SYS	129.0				



MODEL NUMBER INDEX

Model	Power (VA)	Output (VAC)	Frequency (Hz)	Output Phase(s)	Size (see outline index)	Weight (lbs.)	Input Breaker	ESS	Parallel and Three Phase Operation	Reverse Remote
3PH10500-4B-2E-831	10500	115/200	60	3	E-SYS	129.0		✓		
3PH10500-4B-2E-CM-1142	10500	115/200	60	3	E-SYS	129.0				
3PH10500-4B-2H-1092	10500	230/400	60	3	E-SYS	129.0		✓		
3PH10500-4B-2H-CM-1144	10500	230/400	60	3	E-SYS	129.0				
3PH12000-4AP	12000	115/200	60	3	A-SYS	186.0				
3PH12000-4B-2E-881	12000	115/200	60	3	E-SYS	222.0		✓		
3PH12000-4B-2E-CM-1147	12000	115/200	60	3	E-SYS	222.0				
3PH12000-4B-2H-1094	12000	230/400	60	3	E-SYS	222.0		✓		
3PH12000-4B-2H-CM-1149	12000	230/400	60	3	E-SYS	222.0				
PL14000-4B-2E-1621	14000	115	60	1	E-SYS	172.0		✓		
PL14000-4B-2E-CM-1128	14000	115	60	1	E-SYS	172.0				
PL14000-4C-2E-872	14000	230	60	1	E-SYS	172.0		✓		
PL14000-4C-2E-CM-1134	14000	230	60	1	E-SYS	172.0				
PL17500-4B-2E-1632	17500	115	60	1	E-SYS	215.0		✓		
PL17500-4B-2E-CM-1633	17500	115	60	1	E-SYS	215.0				
3PH18000-4B-2E-886	18000	115/200	60	3	E-SYS	333.0		✓		
3PH18000-4B-2E-CM-1157	18000	115/200	60	3	E-SYS	333.0				
3PH18000-4B-2H-1098	18000	230/400	60	3	E-SYS	333.0		✓		
3PH18000-4B-2H-CM-1159	18000	230/400	60	3	E-SYS	333.0				
3PH21000-4B-2E-883	21000	115/200	60	3	E-SYS	258.0		✓		
3PH21000-4B-2E-CM-1147	21000	115/200	60	3	E-SYS	258.0				
3PH21000-4B-2H-1096	21000	230/400	60	3	E-SYS	258.0		✓		
3PH21000-4B-2H-CM-1149	21000	230/400	60	3	E-SYS	258.0				
3PH24000-4B-2E-892	24000	115/200	60	3	E-SYS	444.0		✓		
3PH24000-4B-2E-CM-1167	24000	115/200	60	3	E-SYS	444.0				

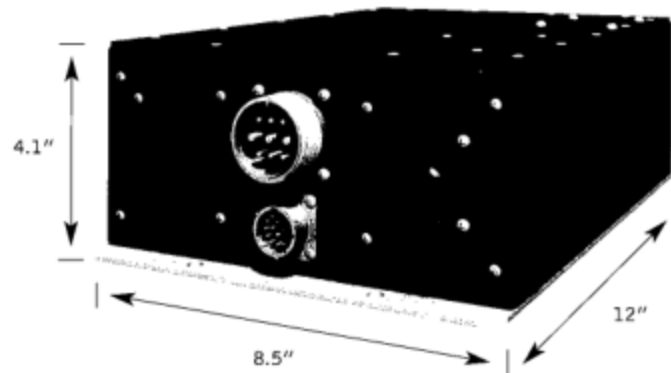


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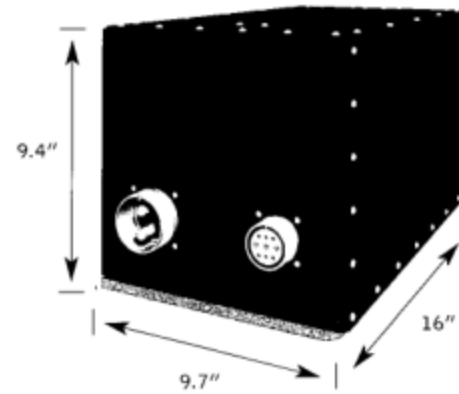
Model	Power (VA)	Output (VAC)	Frequency (Hz)	Output Phase(s)	Size (see outline index)	Weight (lbs.)	Input Breaker	ESS	Parallel and Three Phase Operation	Reverse Remote
3PH24000-4B-2H-1100	24000	230/400	60	3	E-SYS	444.0		√		
3PH24000-4B-2H-CM-1169	24000	230/400	60	3	E-SYS	444.0				
3PH31500-4B-2E-889	31500	115/200	60	3	E-SYS	387.0		√		
3PH31500-4B-2E-CM-1622	31500	115/200	60	3	E-SYS	387.0				
3PH31500-4B-2H-1104	31500	230/400	60	3	E-SYS	387.0		√		
3PH31500-4B-2H-CM-1164	31500	230/400	60	3	E-SYS	387.0				
3PH42000-4B-2E-895	42000	115/200	60	3	E-SYS	516.0		√		
3PH42000-4B-2E-CM-1172	42000	115/200	60	3	E-SYS	516.0				
3PH42000-4B-2H-1102	42000	230/400	60	3	E-SYS	516.0		√		
3PH42000-4B-2H-CM-1174	42000	230/400	60	3	E-SYS	516.0				
4A1000-1GCP	1000	115	50	1	A	15.5			√	
4A1000-1GP	1000	115	50	1	A	15.5	√			
4A1000-1C-1-HRP	1000	230	50	1	B	44.0	√			
4B2000-3H-CM-100-1615	2000	100	50	1	E	37.0	√			
4B2000-3H-NB-100-1010	2000	100	50	1	E	37.0		√	√	
4A2000-1C-1-HRP	2000	115	50	1	B	44.0	√			
4B2000-3H-CM-842	2000	115	50	1	E	37.0	√			
4B2000-3H-NB-1082	2000	115	50	1	E	37.0		√	√	
4B2000-3H-NB-CM-1087	2000	115	50	1	E	37.0			√	
PL2000-4BP	2000	115	50	1	A-SYS	31.0				
4A2000-1A-1-HRP	2000	230	50	1	B	44.0	√			
4B2000-1C-769	2000	230	50	1	E	37.0	√	√		
4B2000-1C-NB-909	2000	230	50	1	E	37.0		√		
4B2000-3E-CM-840	2000	230	50	1	E	37.0	√			
4B2000-3E-NB-1080	2000	230	50	1	E	37.0		√	√	



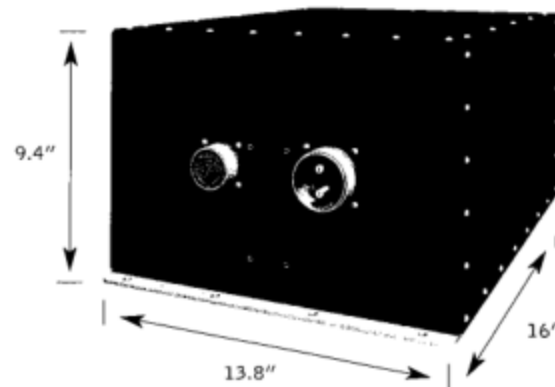
PRODUCT OUTLINE INDEX



OUTLINE A



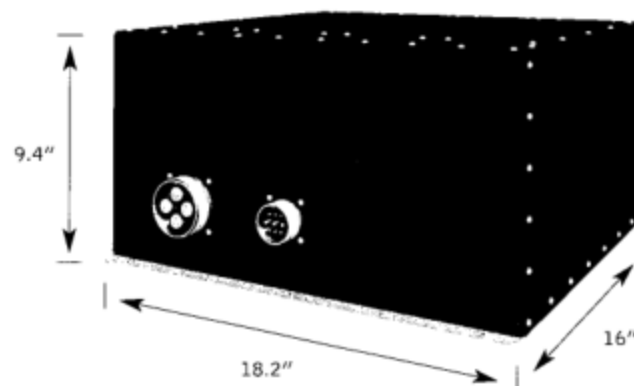
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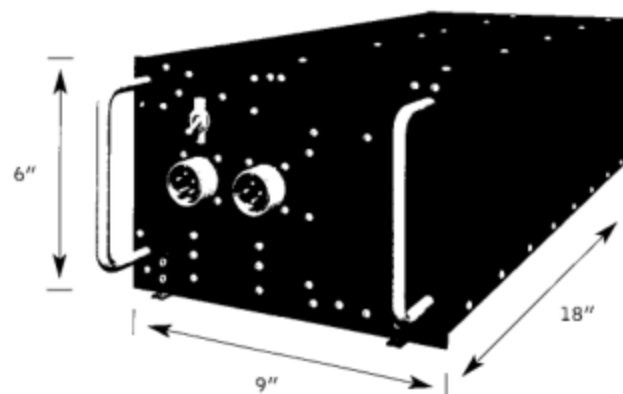
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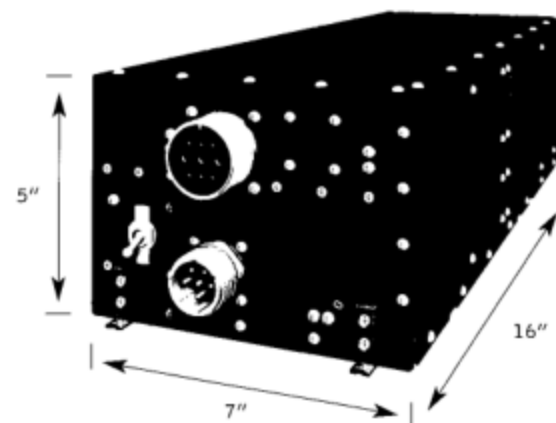
PRODUCT OUTLINE INDEX



OUTLINE D



OUTLINE E



OUTLINE F