AVIONIC INSTRUMENTS INC.
RAHWAY, NEW JERSEY 07065

REMOVAL/INSTALLATION MANUAL

MODELS

1B350-( ), 2A350-( ), 3A350-( )

1B250-( ), 2A250-( ), 3A250-( )

1A125-( ), 2A125-( ), 3A125-( )

1A50-( ), 2A50-( ), 3A50-( )

STATIC INVERTERS

MANUAL NO. 1-001-4901-0011

AVIONIC INSTRUMENTS INC.
943 EAST HAZELWOOD AVENUE
RAHWAY, NEW JERSEY 07065
U.S.A.

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REMOVAL/INSTALLATION MANUAL

FOR

1B350-( ), 2A350-( ), 3A350-( )
1B250-( ), 2A250-( ), 3A250-( )
1A125-( ), 2A125-( ), 3A125-( )
1A 50-( ), 2A 50-( ), 3A 50-( )

STATIC INVERTERS

1st Printing: December, 1983

The information in this manual does not profess to include all details of installation or to cover all the possible contingencies which may arise during installation.

Should special problems arise, or further information be desired, please contact Avionic Instruments Inc., Customer Service Department.

AVIONIC INSTRUMENTS INC.
943 East Hazelwood Avenue
Rahway, N. J. 07065
U. S. A.

AVIONIC INSTRUMENTS INC. WARRANTY CERTIFICATE

AVIONIC INSTRUMENTS INC. has designed, engineered and constructed its Static Inverter with the finest workmanship, materials and components available. Each new Static Inverter has been thoroughly tested and inspected before leaving the factory.

Avionic Instruments Inc. (hereinafter called AI^2), warrants each new Static Inverter manufactured by it to be free from defects in workmanship and materials, under normal use for which it is intended, for 2000 hours, or two years after installation date, or 30 months from shipment, whichever comes first.

A. AI^2 shall have no obligation or liability under this warranty.

1. For special, indirect or consequential personal or property damage arising from failure of the Static Inverter.

2. If the Static Inverter is operated with any accessory, equipment or part not specifically approved by AI^2 unless buyer furnishes evidence that in the judgment of AI^2 such installation was not a cause of failure.

3. If the Static Inverter is not installed, operated or maintained in accordance with AI^2 's instructions furnished under this agreement unless buyer furnishes evidence that in the judgment of AI^2 such installation, operation or maintenance was not a cause of the failure.

4. If the Static Inverter is not operated under normal industry use unless buyer furnishes evidence that in the judgment of AI^2 such operation was not a cause of the failure.

5. If the Static Inverter has been repaired, altered or modified without AI^2's approval or, if the Static Inverter has been operated subsequent to its involvement in an accident or breakdown unless buyer furnishes evidence that in the judgment of AI^2 such repair, alteration, modification, operation, accident or breakdown was not a cause of the failure, provided, however, that this limitation insofar as it relates to repairs, accidents and breakdowns, shall not be applicable to routine repairs or replacements of minor accidents or minor breakdowns which normally occur in the operation of a Static Inverter, if such repairs or replacements are made with suitable materials and according to standard practice and engineering.

B. The warranty provided herein and the obligations of AI^2 thereunder are in lieu of and buyer hereby waives all warranties, guarantees, conditions or liabilities, express or implied including warranties of merchantability and fitness, (except as expressly stated herein) arising by law or otherwise (including, without limitation, any obligation of AI^2 with respect to special, indirect, or consequential damages) and whether or not occasioned by AI^2's negligence and shall not be extended, altered or varied except by a written instrument signed by AI^2 and buyer; provided, that in the event any provision relieving AI^2 from liability for its negligence should for any reason be held ineffective the remainder of the warranty shall remain in full force and effect.

C. In the event of any claim under the warranty, the customer's only and exclusive remedy shall be to require AI^2 to replace or repair (at AI^2 's discretion) at any AI^2 authorized dealer or factory, any defective Static Inverter or any original part or component of such Static Inverter which shall, within the warranty period, be returned, all transportation charges prepaid by the customer. AI^2 will not be obligated to reimburse customer for warranty work performed by other than an authorized warranty repair station. This shall be the limit of AI^2's liability.

D. In order to place the warranty in effect, the warranty card must be completed and mailed to AI^2 within 30 days after the equipment is installed. The Standard Aviation Industry Warranty Form may be substituted at the Dealer's discretion and will be accepted to effect the warranty in lieu of AI^2 warranty.

E. The customer must notify AI^2 by registered mail of any warranty claim within 30 days after discovery thereof. Otherwise, such claim will be deemed waived.

F. AI^2 reserves the right to make changes in design or additions to or improvements in its equipment at its own discretion without obligation to install such additions or improvements in equipment therefore manufactured.

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SERVICE BULLETIN RECORD

SERVICE BULLETIN NUMBER	DATE ISSUED	EQUIPMENT TYPE	SUBJECT

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ILLUSTRATIONS

1. GENERAL

A. Purpose of Manual

This manual contains instructions for installing and removing Avionic Instruments Inc. (AI²) Static Inverter Models 1B350-( ), 2A350-( ), 3A350-( ), 1B250-( ), 2A250-( ), 3A250-( ), 1A125-( ), 2A125-( ), 3A125-( ), 1A50-( ), 2A50-( ), and 3A50-( ).

B. Purpose of Equipment

The purpose of these inverters is to convert DC electrical power to AC electrical power at specified power levels, frequencies, and configurations.

2. DESCRIPTION OF EQUIPMENT

A. General

Static Inverters manufactured by Avionic Instruments Inc. are designed to comply with the rigorous requirements of the aviation environment, but may also be successfully employed in naval, mobile, and stationary installations. The use of switching bridge techniques and carefully designed frequency, voltage, and current control circuits has resulted in efficient, lightweight, and highly reliable power sources. Newly designed inverters with an output frequency of 398 Hz for use with Omega navigational equipment are also available.

B. Model Designations

The model number of each AI² Static Inverter contains information concerning its operating frequency, power level, and configuration capability. The prefix consists of a single digit number, which defines the inverter's operating frequency, followed by a letter, which designates the specific generation of AI² inverters of identical power rating to which the inverter in question belongs. The body of the model number consists of a two to four digit number which defines the nominal operating load capacity of the inverter measured in Volt-Amperes. The suffix, separated from the body by a hyphen and

usually placed in parentheses, designates the allowable configuration(s) of the inverter, or offers further identifying information.

C. Physical and Technical Characteristics

Size

All models described in this manual have the following dimensions: Length: 8.25", Width: 5.25", Height: 2.875"

Weight

All 350VA models: 4.75 lbs.
All 250VA models: 4.50 lbs.
All 125VA models: 4.25 lbs.
All 1A50-( ) models: 4.00 lbs.
All 2A50-( ) and 3A50-( ) models: 3.9 lbs.

Model Differentiation

Model	Output Power*	Output Frequency**	No. of Connectors***	Fan Cooled
1B350-1A	350VA	400 Hz	1	Yes
1B350-1B	350VA	400 Hz	2	Yes
1B350-1C	350VA	398 Hz	2	Yes
2A350-1A	350VA	60 Hz	1	Yes
2A350-1B	350VA	60 Hz	2	Yes
3A350-1B	350VA	50 Hz	2	Yes
1B250-1A	250VA	400 Hz	1	No
1B250-1B	250VA	400 Hz	2	No
1B250-1C	250VA	400 Hz	1	Yes
1B250-1D	250VA	400 Hz	2	Yes
1B250-1E	250VA	398 Hz	2	No
1B250-1F	250VA	398 Hz	2	Yes
2A250-1A	250VA	60 Hz	1	Yes
2A250-1B	250VA	60 Hz	2	Yes
2A250-1C	250VA	60 Hz	2	No
3A250-1B	250VA	50 Hz	2	Yes
1A125-1A	125VA	400 Hz	1	No
1A125-1B	125VA	400 Hz	2	No
1A125-1C	125VA	398 Hz	2	No
2A125-1A	125VA	60 Hz	1	No
2A125-1B	125VA	60 Hz	2	No

Model	Output Power*	Output Frequency**	No. of Connectors***	Fan Cooled
3A125-1B	125VA	50 Hz	2	No
1A50-1A	50VA	400 Hz	1	No
1A50-1B	50VA	400 Hz	2	No
1A50-1C	50VA	398 Hz	2	No
2A50-1A	50VA	60 Hz	1	No
2A50-1B	50VA	60 Hz	2	No
3A50-1B	50VA	50 Hz	2	No

* Power values listed are for continuous operation and at an input voltage of between 24-37VDC. These values are to be prorated or derated according to the following conditions:

Operation duration of 2 hours-prorate to 110% of listed value.
Operation duration of 5 minutes-prorate to 150% of listed value.
Operation at 20VDC input-derate to 90% of listed value for 250VA and 350VA units only.

** Frequency tolerance is ± 0.5% for all models, except the 398 Hz models whose frequency tolerance is ± 0.25%, for all line, load, and temperature conditions.

*** Models having two connectors are capable of parallel operation, phase lock operation, and three phase operation. All 50 Hz inverters are additionally capable of series operation.

Environmental Limits

Altitude: Up to 55,000 feet.
Storage and Shipping Temperature: -65°C to +85°C
Operating Temperature: -55°C to +71°C, continuous operation.

CAUTION: NO MODEL, REGARDLESS OF ITS COOLING METHOD, IS TO BE EXPOSED TO AN AMBIENT TEMPERATURE GREATER THAN +71°C DURING NORMAL OPERATION. ALSO, THE TEMPERATURE DIFFERENCE BETWEEN THE MOUNTING SURFACE AND THE INVERTER BASEPLATE MUST NEVER BE GREATER THAN 5°C AT ANY TIME.

Input Power Requirements

Voltage: 28VDC nominal; 24 to 34VDC normal; 16-38VDC abnormal.

MODEL	CURRENT: NO LOAD	FULL LOAD
1B350-( )	0.75ADC	16.0ADC
2A350-( )	0.75	16.0
3A350-( )	0 .75	16.0
1B250-( )	0.50	11.0
2A250-( )	0.50	11.0
3A250-( )	0.50	11.0
1A125-( )	0.50	5.6
2A125-( )	0.50	5.6
3A125-( )	0.50	5.6
1A 50-( )	0.50	2.5
2A 50-( )	0.50	2.5
3A 50-( )	0.50	2.5

Output Specifications

Model	Voltage(s)*	Full Load Current
1B350-( )	115VAC ± 2% and 26VAC ± 2V (1)	3.04AAC
2A350-( )	115VAC ± 2%	3.04
3A350-( )	115VAC ± 2%	3.04
1B250-( )	115VAC ± 1% and 26VAC ± 2V (2)	2.17
2A250-( )	115VAC ± 1%	2.17
3A250-( )	115VAC ± 1%	2.17
1A125-( )	115VAC ± 1% and 26VAC ± 2V (3)	1.08
2A125-( )	115VAC ± 1%	1.08
3A125-( )	115VAC ± 1%	1.08
1A 50-( )	115VAC ± 2% and 26VAC ± 1V (4)	0.43
2A 50-( )	115VAC ± 1%	0.43
3A 50-( )	115VAC ± 1%	0.43

* AC output is floating (not grounded to chassis).

CAUTION: IF AC RETURN IS TO BE CONNECTED TO CHASSIS GND., THIS CONNECTION IS TO BE MADE ONLY WHEN UNIT IS OFF.

(1) The maximum amount of power available from the 26VAC output of these units is 150VA
(2) The maximum amount of power available from the 26VAC output of these units is 150VA.
(3) The maximum amount of power available from the 26VAC output of these units is 125VA.
(4) The maximum amount of power available from the 26VAC output of these units is 50VA.

NOTE: If both the 115VAC output and the 26VAC output are used simultaneously, the maximum power available from either output is limited according to the other's load, while the total combined power available remains as listed.

Short Circuit Current

All 350VA models: 5.0 Amps AC minimum for 5 minutes.
All 250VA models: 4.0 Amps AC minimum for 5 minutes.
All 125VA models: 2.2 Amps AC minimum for 5 minutes.
All 50VA models: 1.0 Amp AC minimum indefinitely.

Power Factor

All 350VA models: 0.9 lead to 0.8 lag.
All 250VA, 125VA, and 50VA models: 0.7 lead to 0.7 lag.

NOTE: All models are immune to damage by any power factor.

Distortion

All models: 0.75% THD, typical.

Fault Monitor

All models: pin F of J1

non-fault condition: 14VDC at 100mA max. supplied to fault indicator.
Fault condition: Power removed from fault indicator.

NOTE: The fault monitor circuit responds only to a malfunction within the inverter and not to an external short circuit condition.

Qualification

All models: FAA TSO-C73
RTCA DO-160A, Category F2B/RTV/EXXXFXXZAZZ

3. INSTALLATION

A. General

The following consists of suggestions and factors to consider before installing the AI² Static Inverter(s). Close adherence to these procedures will assure that the performance capabilities of this equipment are fully realized.

CAUTION: EXERCISE CARE WHEN UNPACKING THIS EQUIPMENT.

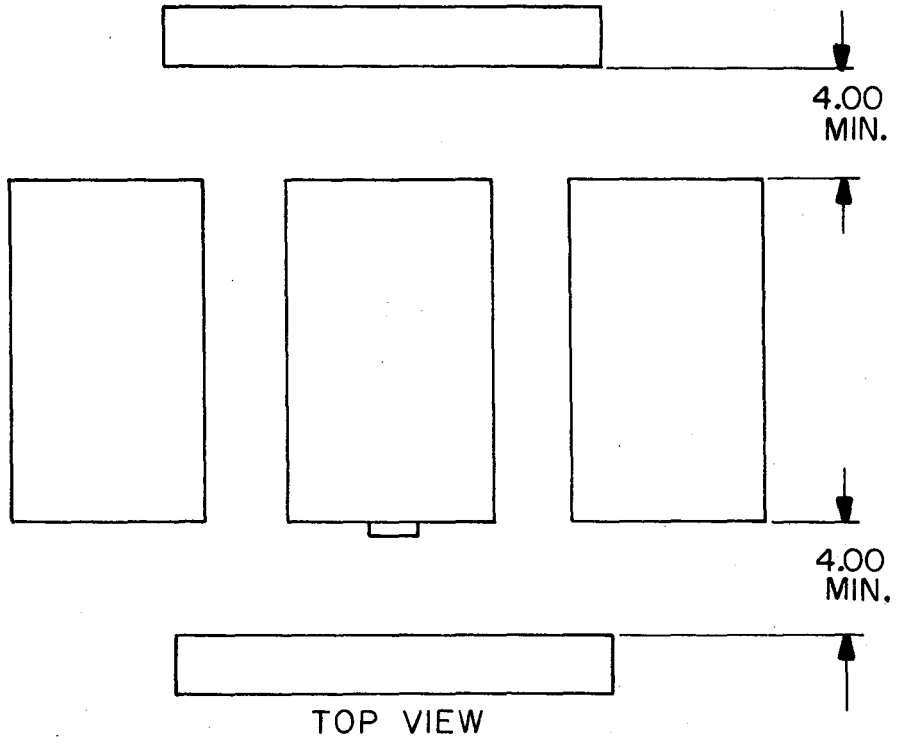
Make a visual inspection of the unit for evidence of damage incurred during shipment. If a claim for damage is to be made, it should be promptly filed with the transportation company. It is also advisable to save the shipping container for equipment storage, reshipment, or claim substantiation.

B. Selection of Mounting Area, Thermal Considerations

The inverter may be mounted in any suitable location in the aircraft, vehicle, or fixed installation provided that the ambient temperature remains between -55°C and +71°C. Space must be provided between the sides of the inverter and the nearest bulkhead or obstruction to allow sufficient air flow to the unit. Figure 1 shows the recommended minimum spacing from the inverter to any surrounding obstructions. The inverter must not be confined to an unventilated compartment. These stipulations apply to all models, both fan cooled and non-fan cooled.

In addition to this, the 250VA non-fan cooled inverters and all 125VA inverters must be mounted on a solid flat surface with minimum dimensions of 12" x 24" x 1/8" and employ thermally conductive grease between the flat mounting surface and the baseplate of the inverter(s).

CAUTION: NO INVERTER, REGARDLESS OF ITS COOLING METHOD, IS TO BE EXPOSED TO AN AMBIENT TEMPERATURE GREATER THAN +71°C DURING NORMAL OPERATION. ALSO, THE TEMPERATURE DIFFERENCE BETWEEN THE MOUNTING SURFACE AND THE INVERTER BASEPLATE MUST NEVER BE GREATER THAN 5°C AT ANY TIME.



ALL DIMENSIONS ARE IN INCHES.

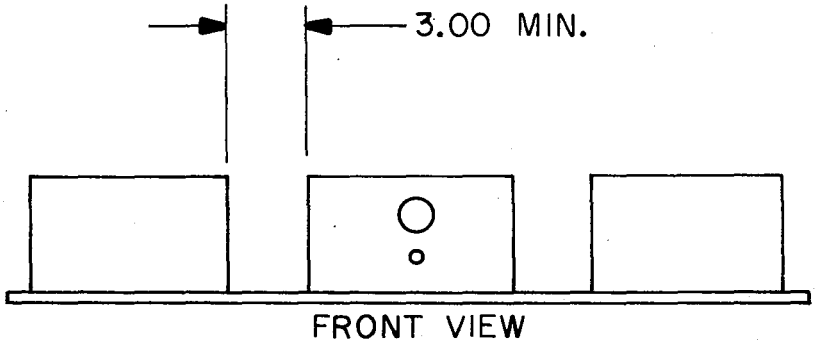


FIGURE I
INVERTER SPACING REQUIREMENTS

C. Selection of Mounting Area, Electrical Considerations

1) Input

The inverters described draw different amounts of input current depending on the inverter power rating, the load seen by the inverter, and the input voltage. To minimize the IR drop in the leads connecting the inverter to the DC bus, the following wire gauges are to be used for the 28VDC input cable:

Inverter Power Rating	Input Cable > 10Ft.	Input Cable < 10 Ft.
350VA	#10AWG	#12AWG
250VA	#10AWG	#12AWG
125VA	#12AWG	#14AWG
50VA	#14AWG	#16AWG

2) Output

Although the 115VAC output is regulated at the inverter output terminals, any appreciable IR drop in the output lines will degrade regulation at the load. To minimize such IR drops, the following wire gauges are to be used for the 115VAC output cables:

Inverter Power Rating	Output Cable > 10 Ft.	Output Cable < 10 Ft.
350VA	#14AWG	#16AWG
250VA	#14AWG	#16AWG
125VA	#16AWG	#18AWG
50VA	#18AWG	#20AWG

3) Circuit Breakers

The use of input and output circuit breakers with inverters is strongly recommended. In an installation using an infinite power source, breakers or fuses are selected for the purpose of protecting the output cable to the load. However, in an installation using a finite power source such as a static inverter, both input and output breakers or fuses are selected to respond to the limited overload capacity of the inverter.

Circuit breakers are preferable to fuses due to the availability of circuit breakers designed for a wide variety of trip conditions, and their ability to function as an ON/OFF switch for both the inverter and the load. Additionally, it is advisable to employ two output circuit breakers; one on each side of the load.

D. Installation Procedure

1) Physical and Mechanical Requirements - Refer to Figure 2

Select a suitable pressurized area where the ambient temperature never exceeds 71°C, or an unpressurized area where the ambient temperature never exceeds 71°C at sea level or 25°C at 55,000 feet, and is properly derated for varying altitudes and varying weather and operating conditions.

CAUTION: ALL BASEPLATE-COOLED INVERTERS MUST BE MOUNTED ON A SOLID FLAT SURFACE (NOT HONEYCOMB) MEASURING AT LEAST 12" x 10" x 1/8" AND MUST EMPLOY THERMALLY CONDUCTIVE GREASE BETWEEN THE FLAT MOUNTING SURFACE AND THE BASEPLATE OF THE INVERTER(S).

Material thickness depends on total weight of components mounted on the surface. Select a mounting area having sufficient strength to support the inverter weight plus other equipment installed on the mounting surface.

The mounting surface may be either solid aluminum or aluminum honeycomb. If a solid surface is chosen, tapped holes may be used. In this case the screws should be long enough to protrude at least 1½ threads beyond the mounting surface, and nuts are not required. If a honeycomb surface is chosen, the mounting holes must be drilled through the surface, mounting nuts must be used, and the screws must be long enough to protrude at least 1½ threads beyond the nuts.

CAUTION: DO NOT USE TAPPED HOLES ON HONEYCOMB MOUNTING SURFACES.

In either case, the screws must allow at least three threads to be engaged or enclosed by the mounting surface. Use screws with the highest pitch (thread density) available. The diameter of the screws and the holes in the mounting surface should match that of the inverter baseplate flanges, which will pass #10 (or 5mm metric) screws. Fasten the inverter tightly against the mounting surface with four screws using flat washers and lock washers between the screw heads and the inverter baseplate flanges.

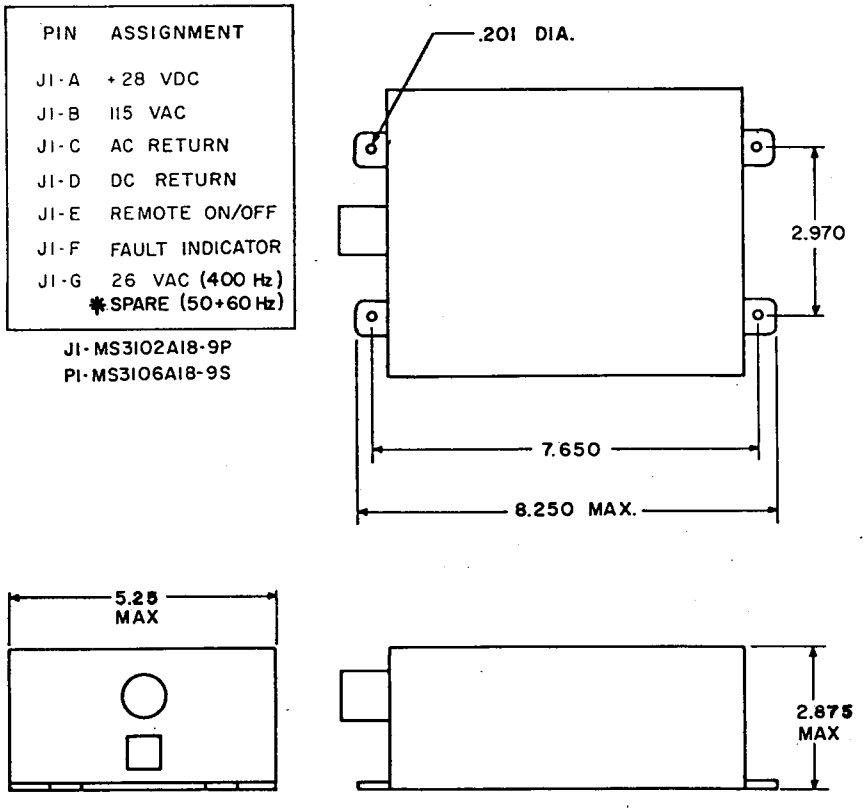


FIGURE 2
INVERTER DIMENSIONS AND PIN ASSIGNMENTS

2) Electrical Requirements

CAUTION: ALL CONNECTIONS ARE TO BE MADE WHILE THE INVERTER IS OFF.

CAUTION: NO CHANGES TO THE CONNECTIONS SPECIFIED IN THIS MANUAL ARE PERMITTED WITHOUT PRIOR CONSULTATION WITH AVIONIC INSTRUMENTS INC.

a) Single Inverter Configuration - Refer to Figure 3

The input/output connector is designated J1, AI² Part No. EA-1809-00 (MS3102A18-9P). Its mating plug, designated P1, AI² Part No. EB-1807-00 (MS3106A18-9S) is supplied with the inverter and is to be wired as described in the following paragraphs.

(1) Input Cable

Fabricate an input cable with two wires of the gauge specified in paragraph 3.C.1) of this manual, and solder them to pins A and D of mating plug P1. Connect P1-A to the main input breaker from the +28VDC bus, and connect P1-D to the 28VDC return. Shielding of the input cable is recommended, and should be connected to P1-D and the 28VDC return.

(2) Output Cable

Fabricate an AC output cable for a 398 Hz or 400 Hz inverter with two wires of the gauge specified in paragraph 3.C.2) of this manual, and solder them to pins B and C of mating plug P1. Connect P1-B through an output breaker to the 115VAC side of the load, and connect P1-C through an output breaker to the AC return side of the load. If the 26VAC output is used, solder another wire of the same gauge to pin G of P1, and connect it (through an output breaker) to the 26VAC load. Similarly, the return side of the 26VAC load is connected through a circuit breaker to P1-C. If

shielded cable is used, connect the shield to P1-C and the AC common. This shield may be grounded to the unit chassis if so desired. For 50 Hz and 60 Hz units, an additional wire must be connected from the P1-C pin to the chassis of the inverter.

CAUTION: THE 115VAC AND 26VAC OUTPUT WIRES MUST BE TWISTED OR SHIELDED

NOTE: It is recommended that the 28VDC input wires be twisted or shielded.

NOTE: It is recommended that the chassis of the inverter be connected to earth or aircraft ground.

(3) Remote ON/OFF Switch

The inverter may be operated from a remote ON/OFF switch by connecting one conductor of a two conductor, #22AWG, shielded, teflon jacketed cable to pin E of mating plug P1, and the other conductor and the shield to pin D of the same plug. This cable is then run to a location remote to the inverter and the two conductors are connected to a SPST switch. When the switch is open, the inverter operates normally; when it is closed, the inverter output is disabled and no output voltage is available.

(4) Fault Indicator

A fault indicator may be utilized by connecting a #22AWG wire to pin F of mating plug P1, and running this wire to a 14VDC, 100 mA max. device such as a lamp, relay, or buzzer. The other contact of the indicator is connected, again with a #22AWG wire, to the DC return (or pin D of mating plug P1).

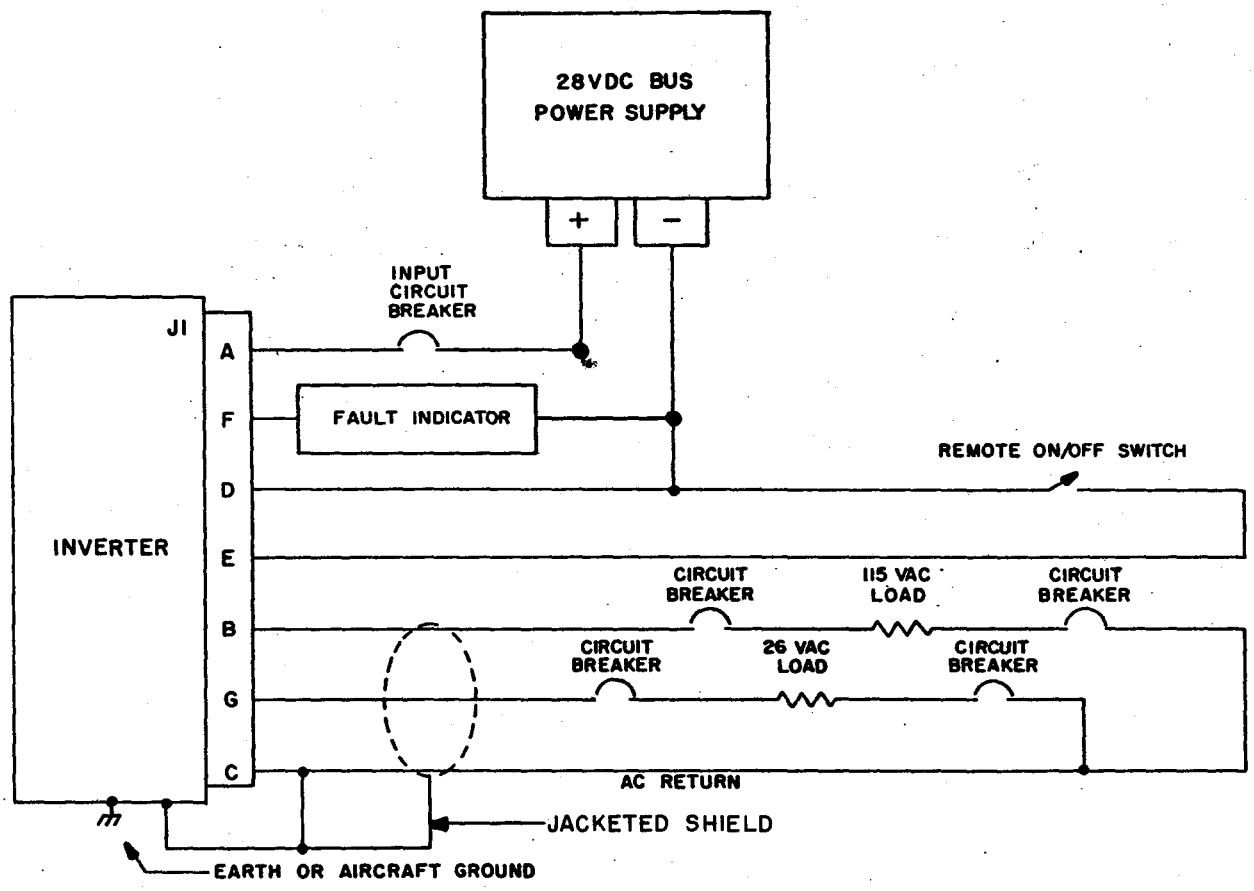


FIGURE 3
SINGLE INVERTER CONFIGURATION

b) Parallel Configuration - Refer to Figure 4

Inverters having J2 connectors are parallelable in configurations of up to four identical inverters. The paralleling cable which couples the J2 connectors of each inverter is prepared exclusively by AI² to accomodate the specific number of inverters the customer requests. The input/output mating plug P1, however, must be wired by the customer as follows:

(1) Input Cable

Fabricate an input cable for each inverter, using two wires of the gauge specified in paragraph 3.C.1) of this manual, and solder them to pins A and D of each P1 mating plug. Connect the wires from the P1-A pins to a common input breaker from the +28VDC bus, and connect the wires from the P1-D pins to the 28VDC return. Shielding of the input cables is recommended, and should be connected to the P1-D Pins and the 28VDC return.

(2) Output Cable

Fabricate an AC output cable for each 398 Hz or 400 Hz inverter using two wires of the gauge specified in paragraph 3.C.2) of this manual, and solder them to pins B and C of each P1 mating plug. Connect the wires from the P1-B pins through a common output breaker to the 115VAC side of the load, and connect the wires from the P1-C pins through a common output breaker to the AC return side of the load. If the 26VAC output is to be used, it must be connected in the same manner as described for the single inverter configuration in paragraph 3.D.2)a)(2) of this manual. For 50 Hz and 60 Hz units, an additional wire must be connected from each P1-C pin to the chassis of the inverter. If shielded cable is used, connect the shields to the P1-C and the AC common.

CAUTION: THE AC OUTPUT AND RETURN LEADS MUST BE TWISTED OR SHIELDED.

NOTE: It is recommended that the 28VDC input wires be twisted or shielded.

NOTE: It is recommended that the chassis of the inverters be connected to earth or aircraft ground.

(3) Remote ON/OFF Switch

If the remote ON/OFF function is to be used, the switches which operate each inverter must be isolated from each other and must cause all the inverters to turn on or off simultaneously. This nesessitates the use of one multiple pole, single throw switch on which each inverter occupies one set of poles. For example, Figure 4 shows two inverters employing the required double pole, single throw switch. Pins E and D on plug P1 of each inverter are connected to separate sets of poles on the multiple pole switch with #22AWG 2-conductor, shielded, teflon jacketed cable. One conductor is connected to Pin E, and the other conductor and the shield are connected to pin D. If shielded cable is not available, twisted pairs of #22AWG wire may be used instead.

(4) Fault Indicator

The fault indicator for each inverter is connected for parallel operation in the same manner as that described for single inverter operation in paragraph D.2)a)(4) of this manual.

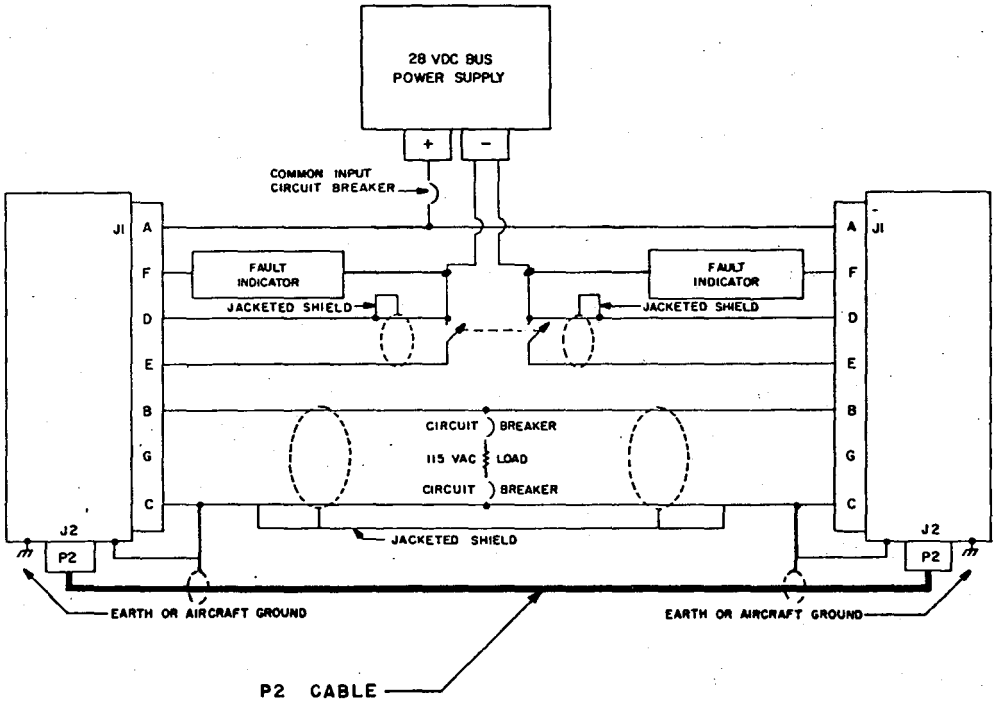


FIGURE 4
PARALLEL CONFIGURATION

c) Phase Lock Configuration

Up to four inverters having J2 connectors may be operated in the phase lock mode in order to drive their separate loads in phase synchronization. The phase lock cable which couples the J2 connectors of each inverter is prepared exclusively by AI² to accomodate the specific number of inverters the customer requests.

(1) Input Cable and Remote ON/OFF Switch

The inverter connected to the phase lock cable P2 mating plug labeled "MASTER" must be turned on at the exact moment the "SLAVE" units(s) are turned on. Therefore, the use of a common input circuit breaker and a ganged multiple pole, single throw, remote ON/OFF switch, as described for parallel operation in paragraphs D.2)c)(1) and (3) of this manual, is required.

(2) Output Cable and Fault Indicator

The AC output cables and the fault indicator from the J1 connector of each inverter are to be wired to the P1 mating plug by the customer in the same manner as described for the single inverter configuration in paragraphs D.2)a)(2) and (4) of this manual.

d) Series Configuration - Refer to Figure 5

A 50 Hz inverter may be connected with another identical 50 Hz inverter to form a series configuration having an output voltage of 230VAC. The series cable which couples the J2 connectors of the series pair of inverters is manufactured by AI². The input/output P1 mating plugs, however, must be wired by the customer as follows:

(1) Input Cable

Fabricate an input cable for each inverter using two wires of the gauge specified in paragraph 3.C.1) of this manual, soldering them to

pins A and D of each P1 mating plug. Connect the wires from the P1-A pins to a common input breaker from the +28VDC bus, and connect the wires from the P1-D pins to the 28VDC return. Shielding of the input cables is recommended and should be connected to the P1-D pins and the 28VDC return.

(2) Output Cable

Fabricate the 230VAC output cable using three wires or three single-conductor, shielded cables of the gauge specified in paragraph 3.C.2) of this manual. Connect one conductor from P1-C of inverter #1 to P1-B of inverter #2. This conductor is the inter-unit series connection and must NOT be grounded at any time. Connect another conductor to P1-B of inverter #1. This conductor is the 230VAC output of the system. Then connect the third conductor, together with the three-shields from the cables, to P1-C of inverter #2. This conductor is the 230VAC return of the system and may float or be grounded.

CAUTION: THE ACTUAL 230VAC OUTPUT AND RETURN LEADS TO THE LOAD EQUIPMENT BEING UTILIZED MUST BE TWISTED OR EMPLOY A SHIELD.

NOTE: Twisting or shielding the 28VDC input wires is recommended.

NOTE: It is recommended that the chassis of the inverters be connected to earth or aircraft ground.

(3) Remote ON/OFF Switch

The inverters in the series configuration may be operated from a remote location by employing a double-pole, single-throw switch in the same manner as that described for parallel operation

in paragraph D.2)c)(3) of this manual.

(4) Fault Indicator

The fault indicator for each inverter is connected for series operation in the same manner as that described for single inverter operation in paragraph D.2)a)(4) of this manual.

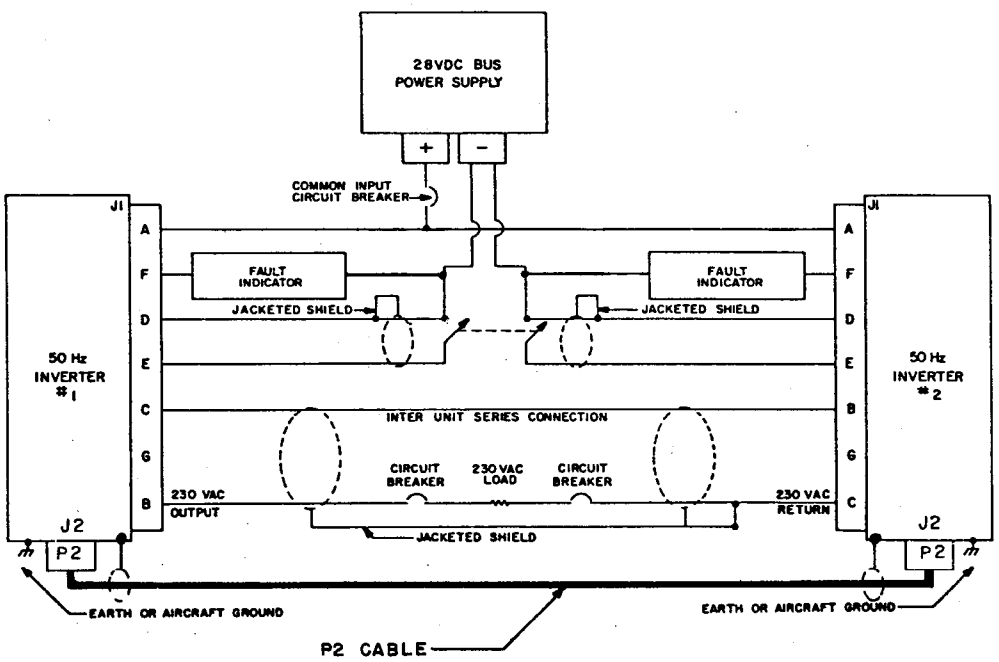


FIGURE 5
50 Hz, 230VAC SERIES CONFIGURATION

e) Three Phase Configuration - Refer to Figures 6 and 7

Identical inverters having J2 connectors may be connected in a three phase wye configuration. This requires the use of a three phase J2 cable harness (prepared exclusively by AI²) in conjunction with an AI² Model No. 3PH-303 three phase wye box.

(1) Input Cable and Remote ON/OFF Switch

The inverters in this configuration must all be turned on at the exact same moment. Therefore, the use of a common input circuit breaker and a ganged three pole, single throw remote ON/OFF switch, similar to that described for parallel operation in paragraphs 3.D.2)c)(1) and (3) of this manual, is required.

(2) Output Cable - Refer to Figure 6

Fabricate an AC output cable for each 398 Hz or 400 Hz inverter using two wires of the gauge specified in paragraph 3.C.2) of this manual, and solder them to pins B and C of each P1 mating plug. Connect the wires from P1-B pins through three ganged output circuit breakers onto each phase leg of the three phase wye load. Connect the wires from the P1-C pins to each other and to the neutral leg of the wye load. If the 26VAC output is to be used, it must be connected in the same manner as described for the single inverter configuration in paragraph 3.D.2)a)(2) of this manual. For 50 Hz and 60 Hz units, an additional wire must be connected from each P1-C pin to the chassis of the inverter. If shielded cable is used, connect the shields to the P1-C pins and the AC common.

CAUTION: THE AC OUTPUT AND RETURN LEADS MUST BE TWISTED OR SHIELDED.

CAUTION: THE INVERTERS MAY BE CONNECTED IN A WYE OUTPUT ONLY, AND MUST NOT BE CONNECTED IN A DELTA CONFIGURATION.

NOTE: It is recommended that the 28VDC input wires be twisted or shielded.

NOTE: It is recommended that the chassis of the inverters be connected to earth or aircraft ground.

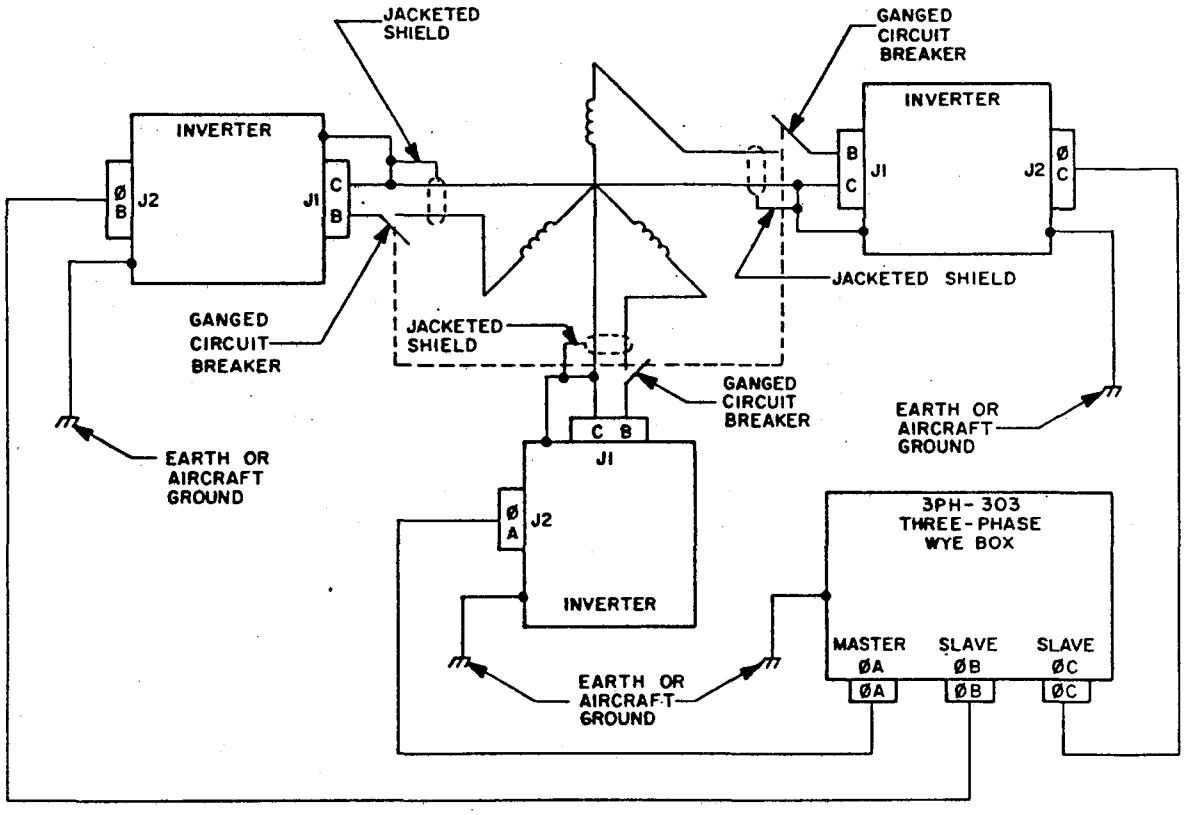


FIGURE 6
MAIN OUTPUT 3Ø WYE LOAD CONNECTIONS

(3) Interconnecting Cable Harness-
Refer to Figure 7

The J2 interconnecting cable harness is available for configurations of one or more inverters per phase.

The end of the harness that mates with the 3PH-303 three phase wye box is terminated with three identical 6 pin female connectors (AI² Part No. EB-0011-00) labeled ØA, ØB, and ØC. Each of these connectors must be matched and mated with its identically labeled male plug counterpart on the 3PH-303 three phase wye box. The end of the harness that mates with the J2 connectors on the inverters is terminated with at least three identical 12 pin female connectors (AI² Part No. EB-0030-00) labeled ØA, ØB, and ØC.

The 3PH-303 three phase wye box locks the output of the inverters into a three phase wye relationship. The inverter(s) connected to the ØA harness connector(s) become(s) the MASTER inverter(s) of the system, while those connected to the ØB and ØC harness connectors become the SLAVE inverters of the system.

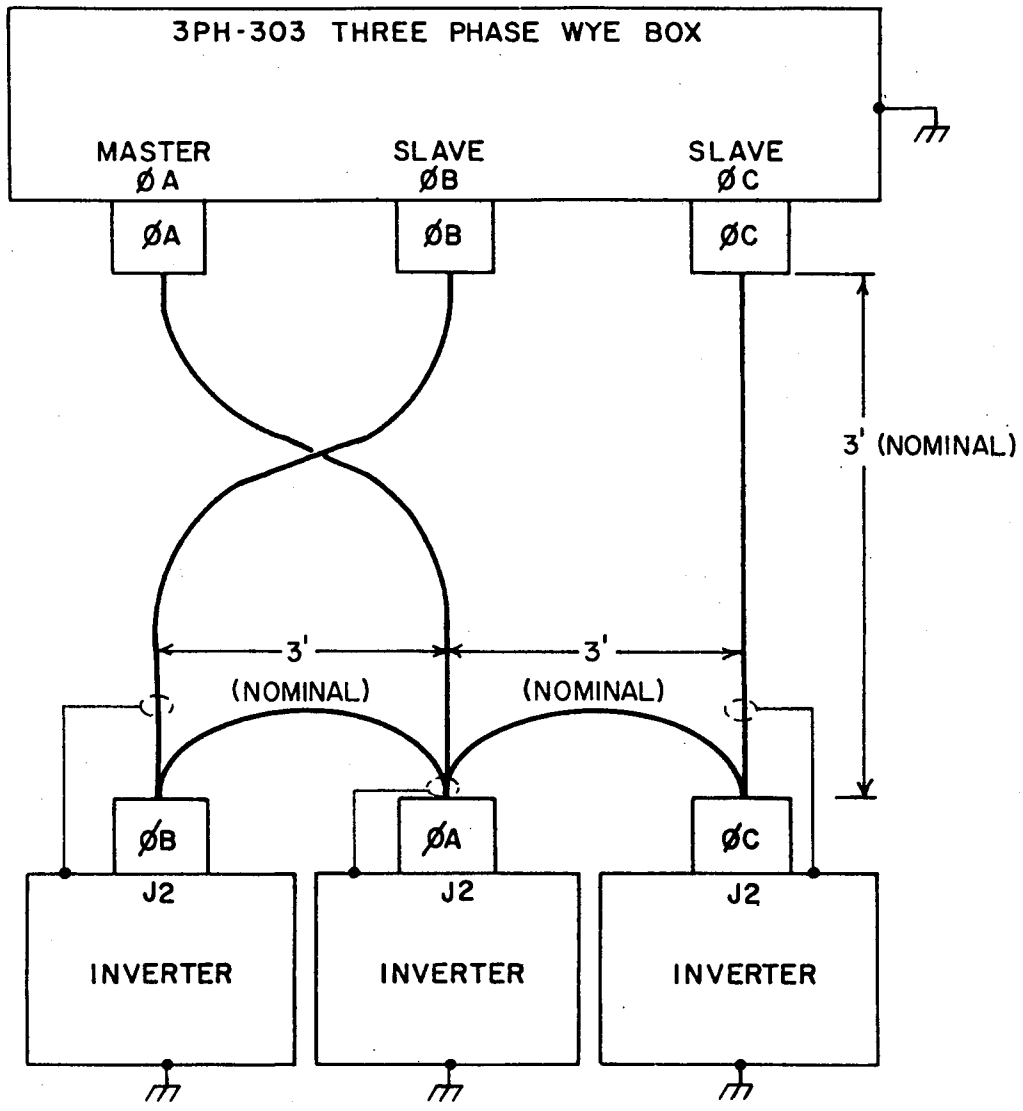


FIGURE 7
THREE INVERTER, THREE PHASE INTERCONNECTING CABLE HARNESS CONFIGURATION

3. REMOVAL

A. Removal Procedure

When it is required that the inverter(s) be removed from the mounting surface, this procedure must be carried out carefully. The following steps are recommended to insure that damage to the inverter(s) does not occur.

1) Remove the input/output power cable(s) from the J1 plug(s).

2) Remove the parallel/phase lock/three phase cable (if used).

3) Remove the four mounting screws that secure the inverter(s) to the mounting surface. Any inverter(s) mounted base up or to the side of a structure must be supported during this operation.

4) Carefully remove the inverter(s).

5) Store inverter(s) in a clean, dry environment.

AVIONIC INSTRUMENTS INC.
RAHWAY, NEW JERSEY 07065

AVIONIC INSTRUMENTS INC. WARRANTY CERTIFICATE

AVIONIC INSTRUMENTS INC. has designed, engineered and constructed its Static Inverter with the finest workmanship, materials and components available. Each new Static Inverter has been thoroughly tested and inspected before leaving the factory.

Avionic Instruments Inc. (hereinafter called AI^2), warrants each new Static Inverter manufactured by it to be free from defects in workmanship and materials, under normal use for which it is intended, for 2000 hours, or two years after installation date, or 30 months from shipment, whichever comes first.

A. AI^2 shall have no obligation or liability under this warranty.

1. For special, indirect or consequential personal or property damage arising from failure of the Static Inverter.

2. If the Static Inverter is operated with any accessory, equipment or part not specifically approved by AI^2 unless buyer furnishes evidence that in the judgment of AI^2 such installation was not a cause of failure.

3. If the Static Inverter is not installed, operated or maintained in accordance with AI^2's instructions furnished under this agreement unless buyer furnishes evidence that in the judgment of AI^2 such installation, operation or maintenance was not a cause of the failure.

4. If the Static Inverter is not operated under normal industry use unless buyer furnishes evidence that in the judgment of AI^2 such operation was not a cause of the failure.

5. If the Static Inverter has been repaired, altered or modified without AI^2's approval or, if the Static Inverter has been operated subsequent to its involvement in an accident or breakdown unless buyer furnishes evidence that in the judgment of AI^2 such repair, alteration, modification, operation, accident or breakdown was not a cause of the failure, provided, however, that this limitation insofar as it relates to repairs, accidents and breakdowns, shall not be applicable to routine repairs or replacements of minor accidents or minor breakdowns which normally occur in the operation of a Static Inverter, if such repairs or replacements are made with suitable materials and according to standard practice and engineering.

B. The warranty provided herein and the obligations of AI^2 thereunder are in lieu of and buyer hereby waives all warranties, guarantees, conditions or liabilities, expressed or implied including warranties of merchantability and fitness, (except as expressly stated herein) arising by law or otherwise (including, without limitation, any obligation of AI^2) with respect to special, indirect, or consequential damages) and whether or not occasioned by AI^2's negligence and shall not be extended, altered or varied except by a written instrument signed by AI^2 and buyer; provided, that in the event any provision relieving AI^2 from liability for its negligence should for any reason be held ineffective the remainder of the warranty shall remain in full force and effect.

C. In the event of any claim under the warranty, the customer's only and exclusive remedy shall be to require AI^2 to replace or repair (at AI^2's discretion) at any AI^2 authorized dealer or factory, any defective Static Inverter or any original part or component of such Static Inverter which shall, within the warranty period, be returned, all transportation charges prepaid by the customer. AI^2 will not be obligated to reimburse customer for warranty work performed by other than an authorized warranty repair station. This shall be in the limit of AI^2's liability.

D. In order to place the warranty in effect, the warranty card must be completed and mailed to AI^2 within 30 days after the equipment is installed. The Standard Aviation Industry Warranty Form may be substituted at the Dealer's discretion and will be accepted to effect the warranty in lieu of AI^2 warranty.

E. The customer must notify AI^2 by registered mail of any warranty claim within 30 days after discovery thereof. Otherwise, such claim will be deemed waived.

F. AI^2 reserves the right to make changes in design or additions to or improvements in its equipment at its own discretion without obligation to install such additions or improvements in equipment therefore manufactured.