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REMOVAL / INSTALLATION

MANUAL

MODEL
HS100

3 PHASE 400 HZ TO 1 PHASE 115 VAC 60 HZ SINE WAVE 1 KVA
FREQUENCY CHANGER

Dwg. No. 112206 Rev. L

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RECORD OF REVISION

REV.	ECO #	BRIEF DESCRIPTION	DATE	BY
N/R	N/A	NO REV. ORIGINAL ISSUE	JUL /95	SS
A	N/A	Skipped	N/A	SS
B	1620	TSO added, ROR page added	DEC 06/95	SS
C	1622	DWG NO to each page added	DEC 08/95	SS
D	1646	Title and header added	FEB 12/96	SS
E	1793	Area code was 818	SEP 18/97	SS
F	2130	Instruction for Continued Airworthiness, Redrawn	AUG 02/00	SS
G	2894	Update page no., Added operating limitation.	MAY 05/06	SS
H	3110	Added Mtg screw size..p7, P/N...5A was 5AMP., p9	AUG 17/07	HS
J	3190	p7&p9 Corrected Circuit Breaker P/N, p11 FedEx was Federal Express	MAY 30/08	HS
K	3291	Updated Pages 6, 7 and 11	SEP 02/09	HS
L	3772	Compliance: none, was FAA TSO-C73 (page 6)	OCT 23/14	HS

NOTE:
G. The latest revision letter governs the revision of this R/I Manual.

LIST OF EFFECTIVE PAGES

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1	JUL /1995	L	OCT 23/14	OCT 23/14
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6	JUL /1995	L	OCT 23/14	OCT 23/14
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1. INTRODUCTION

A. Purpose of Manual

The purpose of this manual is to provide removal/installation instructions for KGS ELECTRONICS Model HS100 (3 phase, 400 Hz to 1 phase 60 Hz sine wave Frequency Changer).

B. Purpose of Equipment

The Model HS100 is designed to power audio/video entertainment systems, portable computers, telecommunication equipment, EMS (emergency medical equipment), microwave oven, coffee maker and other appliances which require 115 VAC, 60 Hz, sine wave power from aircraft 115/200 VAC, 400 Hz, 3 phase electrical systems.

C. Description

The Model HS100 is a solid-state, 3 phase to 1 phase switch-mode converter that converts an input 3 phase AC voltage (115/200 VAC) to a regulated 115 VAC, 60 Hz, sine wave output. The total continuous output power rating for this Model is 1 kVA.

This Model utilizes a crystal controlled oscillator circuit which generates a stable amplitude and frequency reference voltage. Based on this reference voltage and using a pulse width modulation (PWM) topology, four (4) gate signals are produced to drive four (4) power MOSFET devices. The MOSFET devices, used as switches in a full-bridge configuration, create the out

D. Technical Characteristics (SPECIFICATIONS)

INPUT:

Voltage:	115/200 VAC ± 10 VAC, 3 Phase Wye
Frequency:	400 ± 200 Hz
Current:	4 Arms per phase at Full Load (nominal)

OUTPUT:

Voltage:	115 Vrms ± 3 Vrms (nominal), 108 Vrms to 120 Vrms
Current:	8.6 AAC at Full Load (nominal)
Power:	1000 VA
Frequency:	60 Hz ± 0.1 Hz
Phase & Waveform:	Single-phase, Sine
Harmonic Distortion:	0.5% (nominal)
Efficiency:	87% (nominal)
Regulation:	1% Line, 1% Load, 2.5% Temperature
Overload Capacity:	110% of the rated output power for two hours; 150% of the rated output power for five minutes. (Above 55 °C maximum overload is limited to 135% ± 10%)
Protection Circuits:	The unit will shutdown under the following conditions: Input voltage > 137 VAC $\pm$ 5 VAC Input voltage < 80 VAC $\pm$ 20 VAC Internal, high ambient temperature Short circuit condition (MANUAL reset require).
Cooling:	Thermostatically controlled, brushless fan
Operating Temperature:	–65°F to +160°F (–55°C to +71°C)
Altitude:	55,000 Ft.

Environmental Test:

Conditions:	DO-160C Env. Cat. F3ZBB[LV]E1XXXXXBXAXXXBXXX
Compliance:	
Finish:	Gold iridite per MIL-C-5541, Class 1A
Weight:	8.0 ± 0.4 lbs (3.63 ± 0.18 kgs).
Size:	3.40 H x 6.34 W x 12.00 L inches Less protrusion of connector and 86.4 H x 161.0 W x 304.8 L mm screw heads.

2. INSTALLATION

A. General Information

The Model HS100 is ready to be installed into an aircraft when delivered from the factory. If required, the unit can be tested using a bench test setup as shown in Figure 2 prior to the final installation within the aircraft.

B. Selection of Mounting Area

The Model HS100 is to be mounted directly to a metallic plate (or similar supports) that will provide an adequate heat sink to the bottom of the unit. The location of the unit should be in a well ventilated area such that the ambient temperature will not exceed 160 °F (70 °C). Exposure to excessive moisture and excessive mechanical vibration should be avoided. **Do not** block or restrict airflow near the ventilation holes of the unit. If an external fan is located near the unit, the direction of airflow must not conflict with the internal airflow of the unit.

C. Installation Procedures

Figure 1 illustrates the mounting dimensions of the Model HS100. The mounting screws (4 total) should be 1/4-20 size and length long enough to have 2 or more threads exposed after installing the necessary hardware.

Figure 2 illustrates a suggested hook-up for the unit. The mating plug used with the unit is JK30015 (MS3106*18-9SW) and the recommended wire sizes are as follows:
(* = A, B, E, F, R or eq.)

Pin A - #14 AWG	Output 115 VAC, 60Hz Hot
Pin B - #16 AWG	Input Phase A 115/200 VAC, 400 Hz.
Pin C - #16 AWG	Input Phase B 115/200 VAC, 400 Hz.
Pin D - #14 AWG	Output AC Return (Floating). May be chassis grounded.
Pin E - #16 AWG	Input Phase C 115/200 VAC, 400 Hz.
Pin F - #20 or #22	Remote ON - OFF. Ground for ON.
Pin G - #16 AWG	Input Neutral, Chassis Ground

The input of the Model HS100 should be protected by an external, 5 AAC, 3 Phase circuit breaker (583-G533-J1M1-B2S0XN-5A by ETA or MIL-C-5809, 5 AMP or Equivalent).

D. Operating Instruction

Prior to application of input power, check the connection of the load, remote control and input hook-up per the diagram of Figure 2. To operate the unit, apply 3 phase power and connect remote on-off (pin F) to ground.

E. Operating Limitation

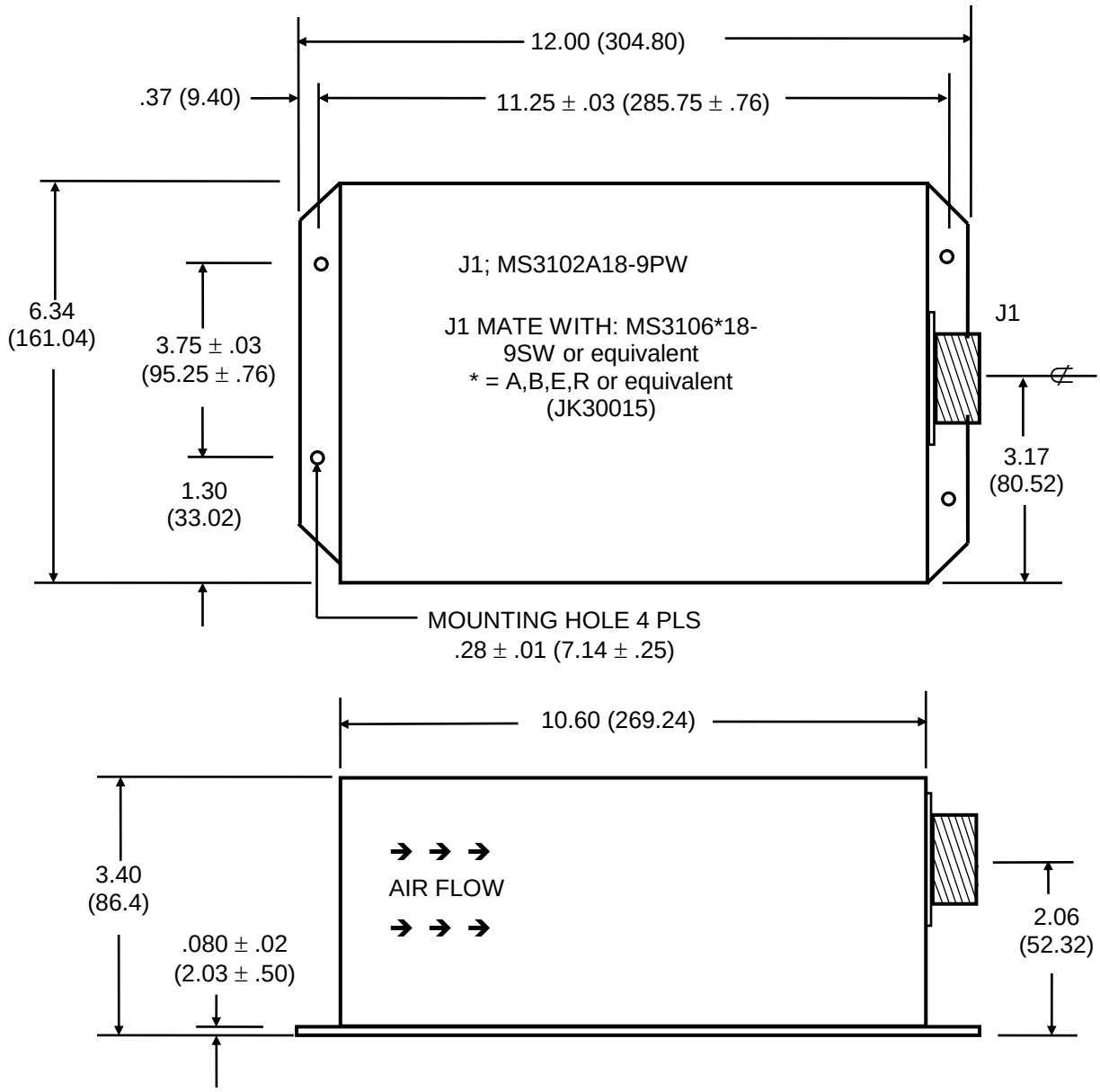
Unit must be installed and operated within the limiting conditions of the above installation procedure, electrical specifications and environmental categories in this manual.

F. Instruction for Maintenance

No regular periodic maintenance is required for this product. Service is required only when a malfunction is detected. Maintenance consists of removal and replacement.

G. Airworthiness Limitation

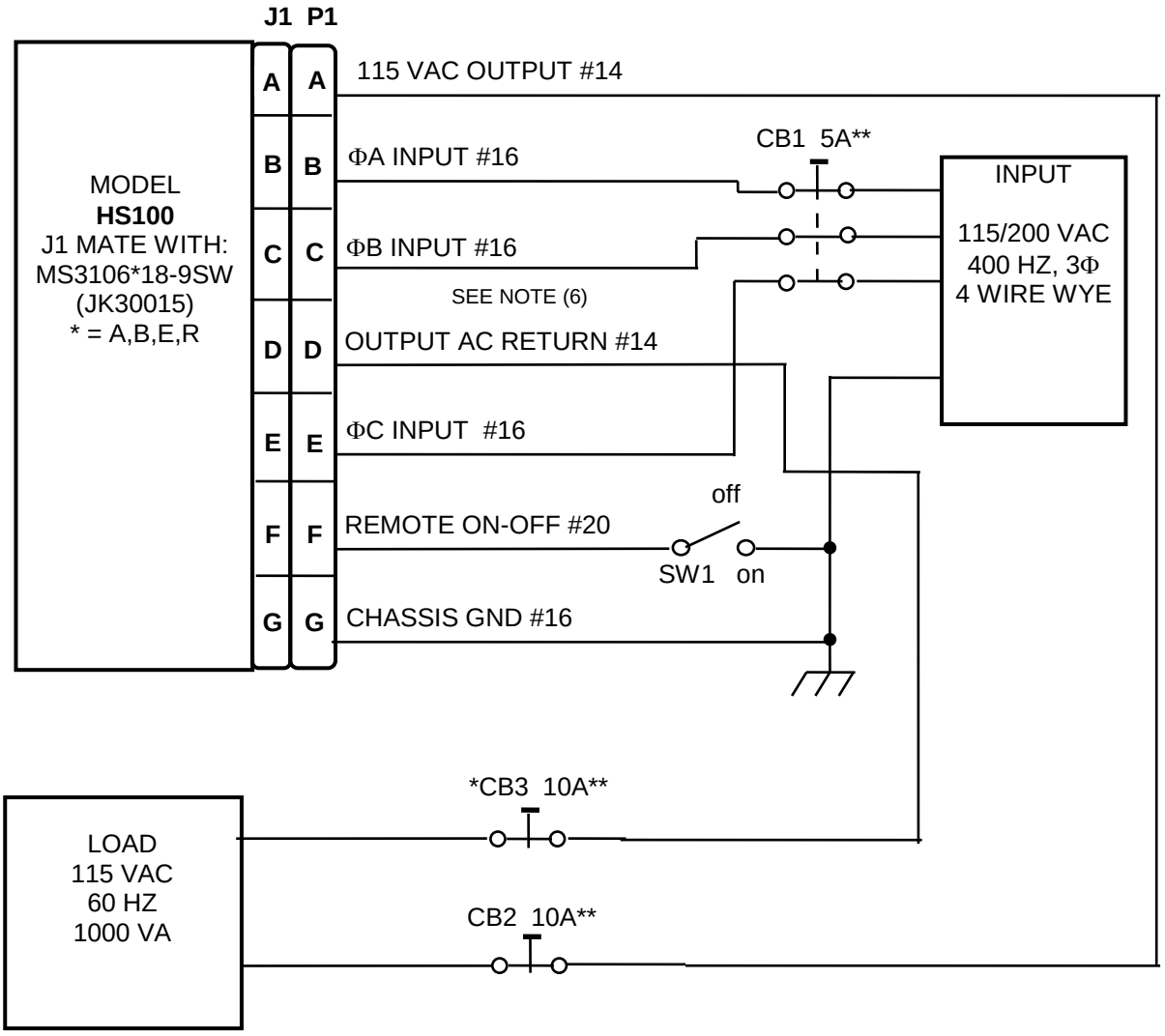
The Airworthiness Limitation Section is FAA approved and specifies maintenance required under 14 CFR 43.16 and 91.403 unless an alternative program has been FAA approved. There are no airworthiness limitations for this unit.



NOTES:

1. Dimensions are inch (mm).
2. Dimensional tolerance is ± 0.06 in. (± 1.52 mm) unless specified.
3. The dimensions shown do not include the protrusion of screw heads.

Figure 1 Outline and Mounting Dimensions



NOTES:

(1). CB1; 5 Amp 3Φ circuit breaker P/N 583-G533-J1M1-B2S0XN-5A by ETA or eq.
(2). CB2; 10 Amp circuit breaker P/N 483-G533-J3M1-C4S0Z-10A by ETA or eq.
*(3). CB3; OPTIONAL circuit breaker P/N 483-G533-J3M1-C4S0Z-10A by ETA or eq.
(4). SW1; On-off switch 1 amp min rating (40 mA actual current).
**(5). The rating of all above circuit breakers should be adjusted according to the actual LOAD.
(6). Output AC return (pin D) may be chassis grounded.

Figure 2 Suggested Hook-Up

3. REMOVAL

(A) Turn off and disconnect the input power source.

(B) Unscrew and disconnect the mating plug from the UNIT.

(C) Unscrew the 1/4-20 mounting screws and remove the UNIT.

(D) Clean the UNIT and store it in a cool and dry place.

4. HOW TO RETURN MATERIAL AND EQUIPMENT

If any material and equipment is to be returned to the factory, under warranty or otherwise, KGS ELECTRONICS must be notified prior to shipment with the following information:

(A) Model and serial number of equipment being returned.

(B) Date purchased.

(C) Date placed in service.

(D) Number of hours in service.

(E) Nature and cause of failure.

(F) Remarks, if any.

Upon receipt of such notice, KGS ELECTRONICS will issue a Return Material Authorization (RMA) number which then authorizes return of the material and equipment to the following address:

Service Department:
KGS ELECTRONICS
418 East Live Oak Avenue
Arcadia, CA 91006-5619
(U.S.A.)

Telephone No.: (626) 574-1175
Facsimile No. : (626) 574-0553
Internet: www.kgselectronics.com

Failure to obtain a RMA number and provide the details listed above may cause unnecessary delay and/or rejection of the returned material and equipment.

All material and equipment returned to the factory must be **freight prepaid.** Acceptable methods of shipment for international return are *Airborne, Burlington Air, DHL, Emery, FedEx, UPS.* For *International* and *World Wide* only, **DO NOT** use "International Commercial Airline" as such carriers may cause a **loss of returned material and equipment.**

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