



Model SFQ1K400 Frequency Converter
Technical Manual

May 11, 2012

Table of Contents

	Page
1 Purpose of Manual	1
1 Purpose of Equipment	1
1.1 Description and Theory of Operation	1
2 Electrical Specifications	2
3 Mechanical Specifications	2
4 Inspection	3
5 Recommended Applications	3
6 Installation	4
7 Hook Up Procedure	4,5
8 Radio Frequency Interference	5
9 Warranty & Repair	6
10 63-SFQ1K400R2 Mechanical Line Drawing	7

1 Purpose of Manual

This manual provides instructions for the application including the installation and removal of the frequency converter Model SFQ1K400. To ensure that the SFQ1K400 is optimally used and properly connected, the user should take time to read this technical manual and follow its directions.

The SFQ1K400 is an innovative frequency converter designed to operate AC devices with electrical power ratings up to 1200 continuous watts. When properly installed, it will provide the user many years of maintenance free service.

Purpose of Equipment

Model SFQ1K400 converts single phase, 360Hz.-500Hz. power to provide 60 Hz. 115VRMS Modified Sine Wave output up to a maximum power level of 1200 Watts. It is primarily intended to operate common AC appliances, which have power consumptions that do not exceed 1200 Watts.

The SFQ1K400 is a member of a family of modified sine wave converters. It generates an alternating voltage waveform similar to that shown in fig. A. For most equipment (within the power range of the SFQ1K400) operation with this type of input is not discernibly different from operation with the 120 Vrms utility voltage waveform delivered by utility power companies, fig. B.

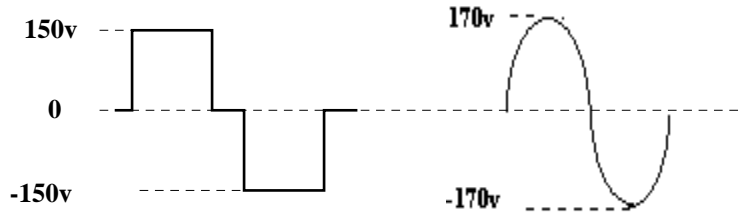


Fig. A Modified sine wave

Fig. B - Sine wave

1.1 Description and Theory of Operation

The Block diagram shown in Figure C illustrates the internal power processing of SFQ1K400

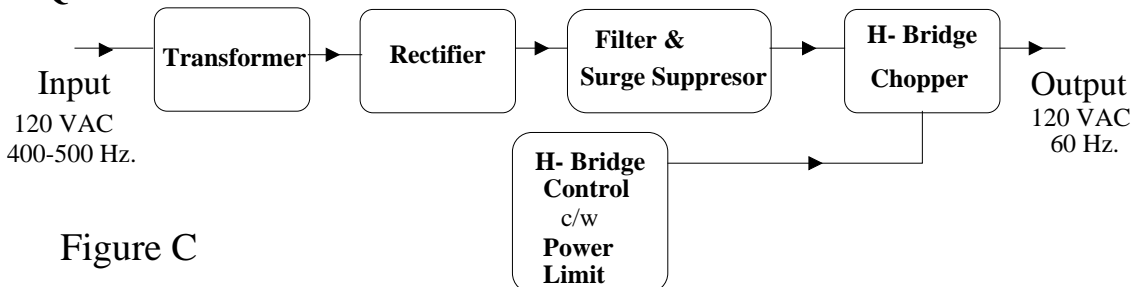


Figure C

The SFQ1K400 is a solid state frequency changer. An internal oscillator generates a 60 Hz. signal that is amplified to ultimately drive a FET H-Bridge Chopper. This configuration is very efficient and makes for a cool running unit with high reliability. The H-Bridge Control Circuit, in addition to driving the power devices, also has protective circuitry against overload and thermal excess.

2 Electrical Specifications:

Input Voltage: 105-132 VAC; 360-500 Hz.; 1 ph.
Output Voltage: 105-132 VAC: 60 Hz.; 1 ph.
Output Current: 10 Amps. Max
Output Current Limit: 13 Amps.
Output Wave Form: Modified Sine
Efficiency: >90%, at full load

Operating Temperature: -20C-60C
Cooling: Convection Cooled

Protection Features:

Electronic Overload: Restricts the power that can be drawn when the power limit point is reached

Spike and Clips incoming voltages at 150 VAC, RMS

Noise Suppression

Other Protection: Input Circuit Breaker

Over-temperature Shutdown -- If the SFQ1K400 overheats due to prolonged operation at high load or because of a high ambient temperature, a chassis mounted thermal cutout switch is activated. This cutout switch temporarily disconnects the AC output load of the SFQ1K400. **The SFQ1K400 will remain in this state until the chassis cools down.** Typically this occurs in 5 minutes. Reset is automatic.

3 Mechanical Specifications

Size: 4.5H x 8.5W x 21.75L (inches) See Page 5

Drawing 63-SFQ1K400

Mounting Points: 6 Holes in Base Flange

Weight: 16 lbs.

Input Connections:(3) Via Canon 5 pin Connector See Diag. E

Output Connection: Via Canon 5 pin Connector See Diag. E

Activity Lights: To Monitor Input & Output

ON-OFF Switch Rocker Switch

4 Inspection

Upon removal of the SFQ1K400 Inverter from its packaging, the user should examine it for any signs of physical damage sustained in shipment. If damage has occurred, it should be returned to vendor for replacement.

5 Recommended Applications. - The SFQ1K400 Inverter will operate most of the following types of electrical equipment and devices designed to operate from a standard 110/120 VAC household electrical line.

- Small microwave ovens**
- Computer Systems**
- Lamps (incandescent and fluorescence)**
- Televisions**
- Radios**
- Stereos**
- Cooling fans**
- Most small power tools up to 3/8 H.P.**
- Blower fans and controls in heating systems (wood pellets stoves etc.)**
- Food mixers, blenders and other low-wattage appliances.**
- Sewing machines**
- Outdoor floodlights**
- Bug zappers**
- Electric fences**
- Burglar alarms**
- Surveillance TV cameras.**

The SFQ1K400 is **not designed** to power higher-wattage heat-producing appliances such as

Space heaters	Frying pans
Coffee makers.	Portable grills
Hair dryers	Large Microwave ovens

To determine if an electrical appliance or tool can be operated from an SFQ1K400, check the voltage and current listed on its nameplate. The voltage should be 115VAC or 120VAC and the current less than 10 Amps. A combination of devices can be powered as long as the sum of their currents does not exceed 10 Amps.

6 Installation

Model SFQ1K400 may be mounted to either a horizontal or vertical surface and can assume any orientation. Six Mounting holes are provided, each to accommodate 1/4 inch bolts. (See mechanical line drawing Figure D on page 7.) The bolt should be long enough to expose at least one and a half threads once the securing nut is tightened down. A spring or serrated lock washers should be used between the nut and mounting flange.

It is important that the air surrounding the unit be unobstructed. The aluminum housing of the unit serves as the heat sink for internal heat dissipative components. It is designed to be mounted in any suitable location of the aircraft where ambient temperature remains between -20C and 60C.

7 Hookup procedure

After having properly secured the SFQ1K400 to its mounting surface, follow the procedure below to connect the unit to the electrical system (See fig. E).

Step 1 Turn the on/off toggle switch on the SFQ1K400 to the **off** position.

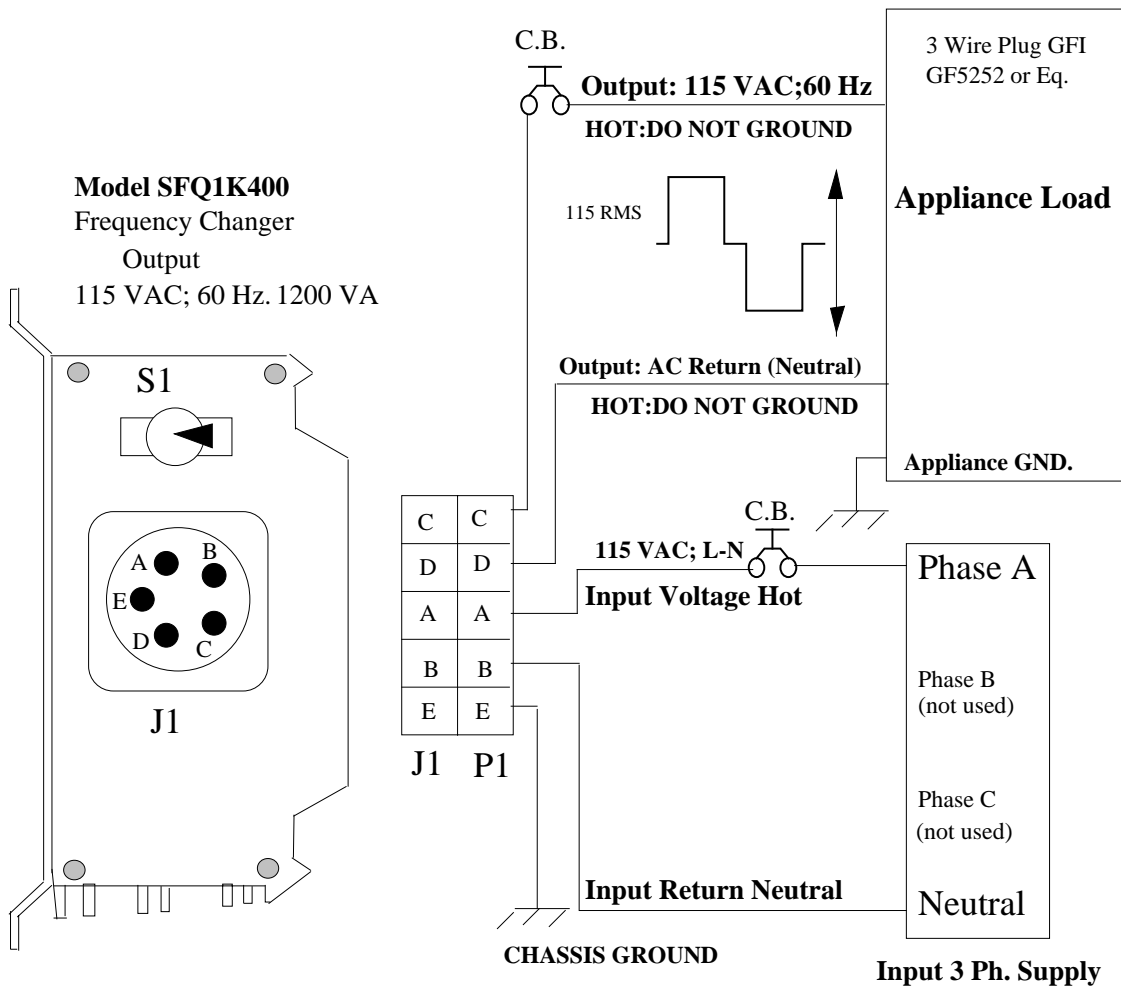
Step 2 Connect the appropriate wires to points on the plug that mates with J1 on the unit. It is recommended that wires for all hook up points be no lighter than 14 gauge. The circuit breakers recommended in Diagram E or their equivalents should be used to ensure suitable protection.

Connecting Loads through a GFI (Ground Fault Interrupted) receptacle is recommended. In such a connection, the Load's (Appliance's) hot and cold (return) leads should be connected to pins C and D respectively. THE APPLIANCE CHASSIS MUST NOT BE GROUNDED. The ground (green) wire of the GFI must be grounded.

If an ordinary receptacle as opposed to a GFI is used, the Load's (Appliance's) hot and cold (return) leads should be connected to pins C and D respectively and the chassis of the appliance should be grounded.

Step 3 Once the unit has been hooked up per the wiring diagram of Figure E, trip the rocker switch to the **"ON"** position and observe that both activity lights are illuminated.

Caution: When operating equipment containing sensitive video or audio circuits, cautionary wiring practices such as using shielded cables, and careful wire routing should be observed. This will minimize potential interference with the operation of such equipment.



J1 Mates with P1: MS3106F 18-11P

Recommended Input Circuit Breaker: 41-2-S14-LN2-15A by ETA
Recommended Output Circuit Breaker: 41-2-S14-LN2-15A by ETA

- L1: Input Voltage Detection Activity Light
- L2: Output Voltage Detection Activity Light
- S1: ON/OFF Switch

Figure E

8 Radio Frequency Interference

SFQ1K400 is a low frequency device and creates no internal signals which may be in the RF spectrum.

9 Repair or Warranty Repair

If your SFQ1K400 has been damaged and is still under warranty, or if the warranty period has expired or has been voided, due to error or misuse, for remedial action, follow the steps outlined below :

A) Contact SEC America, LLC, (Repair Department), at 802-865-8388 to receive a returned merchandise authorization number for shipment back to factory, for a repair estimate.

Failure to obtain an RMA number may cause refusal of the returned item.

B) Any equipment returned for servicing must be shipped freight prepaid to: (Mark RMA# on outside of shipping carton)

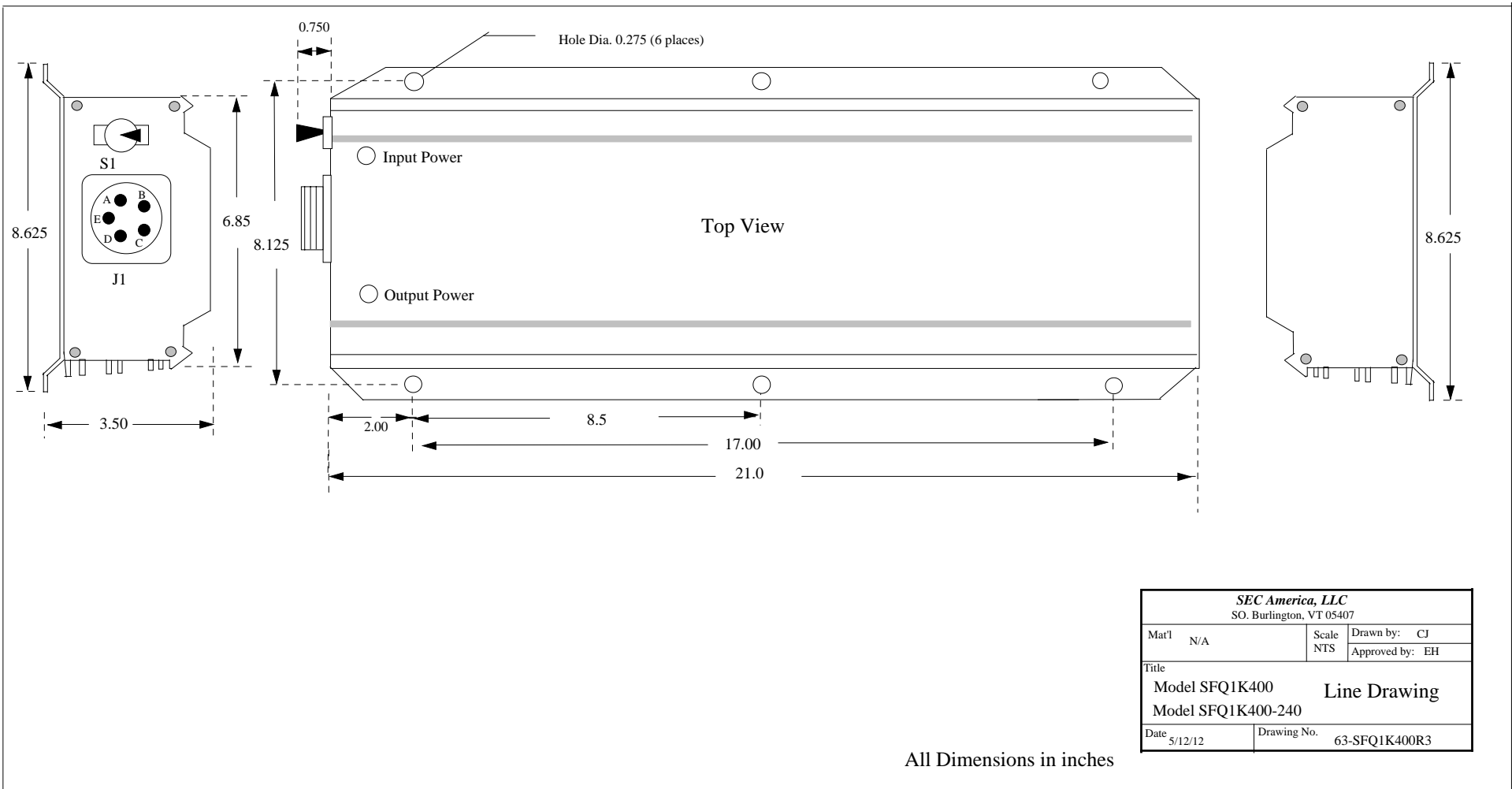
**SEC America, LLC
Repair Department
78 Ethan Allen Drive
SO. Burlington, VT 05403**

**Tel: 802-865-8388
Fax: 802-865-8389
email: sales@secamerica.com**

C) Include the following information with the return:

- 1) name of contact person**
- 2) purchase date**
- 3) date placed in service**
- 4) serial number**
- 5) nature and possible cause of failure**

The SFQ1K400 comes with a 2 year warranty covering parts and labor. The warranty is described in the warranty page enclosed with this manual.



SEC America, LLC SO. Burlington, VT 05407			
Mat'l	N/A	Scale	Drawn by: CJ
		NTS	Approved by: EH
Title		Line Drawing	
Model SFQ1K400		Model SFQ1K400-240	
Date	5/12/12	Drawing No.	63-SFQ1K400R3

All Dimensions in inches