SECTION I
DESCRIPTION

1-1. GENERAL DESCRIPTION

1-2. The Elgar Model 153A is a fully automatic, self-contained, solid state AC Power Source. It is capable of providing three phase AC power at adjustable amplitudes and precise frequencies for use in laboratories, production testing, automatic test systems using computers and frequency conversion applications.

1-3. Featured on the exterior of the Model 153A is a front panel mounted AC voltage meter, phase balance adjustments, a selector switch for monitoring A, B, or C phase outputs and front and rear panel mounted output terminals. Also featured is a blank space which enables either an Elgar fixed or variable frequency oscillator to be installed, thus completing the instrument package.

1-4. The Model 153A has two output voltage ranges of 0.0 to 32 VAC and 0.0 to 130 VAC, which are available in either line to neutral (wye) or line to line (delta) configurations. The two ranges are selected by positioning a four sided printed circuit board inside the instrument. The amplitude is adjustable by a front panel amplitude control.

1-5. The frequency output of the instrument is controlled by an Elgar three phase plug-in oscillator, which is available in either fixed or variable ranges from 45Hz to 5KHz, with fixed frequency accuracies to 0.0001%.

1-6. The instrument includes two DC power supplies which supply the unit's internal operating voltages. Three power amplifiers are also included to amplify the separately phased inputs and to drive the output transformers. The three output transformers included in the Model 153A use a multiple tap principle, thus providing the four dissimilar output voltage configurations.

1-7. A split primary, single phase input power transformer allows the Model 153A to be used with either 115 VAC, 47-63Hz or 230 VAC, 47-63Hz input power; 400Hz input power operation is available on a special order basis.

1-8. PHYSICAL DESCRIPTION

1-9. The Model 153A is housed in a rugged all steel enclosure. The front panel has been equipped to allow for mounting the instrument in a standard 19 inch rack. See Paragraph 2-4 for mounting instructions.

1-10. The Elgar Plug-In Oscillator module (supplied separately) mounts in the blank space located on the front panel of the Model 153A. In most cases, however, the Model 153A will already be equipped with this module depending on the original purchase order. If removal of the oscillator assembly is necessary, the two thumb screws will facilitate its removal or installation.

1-11. The grill assembly located on the front panel and rear panel provide the fan assembly with the necessary air intake and outlet locations for proper operation. The air is drawn into the front grill and exhausted through the rear grill.

CAUTION

Under no circumstances should the front or rear grill assemblies be blocked or serious damage to the Model 153A could occur.

1-12. PERFORMANCE SPECIFICATIONS

1-13. The performance specifications for the Model 153 appear in Table 1-1.

TABLE 1-1. SPECIFICATIONS

OUTPUT PER PHASE	0-50VA
POWER FACTOR	Unity – ±.7
OUTPUT VOLTAGE (Adjustable)	0-32 VAC line to line or line to neutral 0-130 VAC line to line or line to neutral
OUTPUT CONFIGURATION	4 wire wye, isolated from ground. Any one phase or neutral may be grounded.
OUTPUT FREQUENCY RANGE	45Hz – 5KHz at rated power
DISTORTION	Less than .9% (45Hz – 5KHz) Less than .5% (100Hz – 1KHz)
OUTPUT LOAD REGULATION (Regulation may be adjusted thru zero for specific loads and frequencies)	±1% 45Hz – 5KHz
INPUT LINE REGULATION	±.25% for ±10% input line change
HUM AND NOISE	–70 db below full output
INPUT POWER	115 or 230VAC, single phase 47-63Hz. 450 VA maximum.
OPERATING TEMPERATURE RANGE	0-50°C
WEIGHT	65 lbs approximately

1-14. BLOCK DIAGRAM DESCRIPTION

1-15. A general block diagram for the Model 153A is shown in Figure 1-1. The AC Power Source functionally consists of two DC power supplies, three power amplifiers with associated control circuitry and three output power transformers. The DC supplies are obtained from a full wave bridge rectifier connected to the secondary of the input power transformer. These supplies provide a nominal plus and minus 35V DC which are used as operating and bias voltages for the three amplifiers. The power ampli-