

SECTION I

GENERAL DESCRIPTION

1-1. INTRODUCTION

1-2. This manual has been prepared for use with the Elgar Models 251 and 501A AC Power Sources. The information it contains is intended for use by operators and trained technicians. The manual provides information regarding the installation, theory of operation and maintenance of the AC Power Source. Also included is a parts list and schematic diagrams to aid in maintaining the unit at optimum performance.

1-3. GENERAL DESCRIPTION

1-4. The Elgar Models 251 and 501A Power Sources provide AC power at precise frequencies for testing, motor operation, and frequency conversion.

1-5. The basic power amplifier consists of two DC power supplies and a direct-coupled amplifier driving a tapped output transformer. The output transformer of the Model 251 provides nominal output voltages of 28, 115, and 230 VAC, that are adjustable between 0-32, 0-130, and 0-260 VAC. The output transformer of the Model 501A provides nominal output voltages of 0-65, 0-130, and 0-260 VAC. The total available power for the Model 251 is 250VA and 500VA for the Model 501A at the rated output voltages.

1-6. Power at less than full-rated output voltage is derated as shown in Figure 1-1. Figure 1-2 shows a typical harmonic distortion curve over the frequency range of both units. The input power for both units is 115 or 230 VAC $\pm 10\%$, 47-53Hz, 1 ϕ .

1-7. Output power frequency is established by a plug-in oscillator module. Output frequency range of the Model 251 at full power is 45 Hz to 5KHz and at rated half power is 5KHz to 10KHz. The output frequency range of the Model 501A is 45 Hz to 5KHz at full power. A variety of fixed and variable frequency plug-in oscillator modules are available with frequency tolerances up to .0001%. (Refer to the specific oscillator manual.)

1-8. The basic power source output is single phase. Multi phase power can be obtained, however, by stacking two or three power sources, all driven by a multi-phase plug-in oscillator module.

1-9. PHYSICAL DESCRIPTION

1-10. The Elgar Models 251 and 501A are each contained in an all-steel enclosure designed with a standard 19-inch rack-mounting and slide-out capability. Refer to paragraph 2-4, Section II for mounting instructions. The front panels of the Models 251 and 501A each contain a voltmeter, a voltage amplitude control, a power circuit breaker and indicator lights.

1-11. The wind tunnel contains the output power heatsink assemblies, which comprise a two-section power amplifier. The voltage amplifier and control circuitry is contained on a plug-in circuit board with test points and adjustment controls available at the top of the board. The Model 251 has a special plug-in board which selects anyone of four output voltage configurations 0-32, 0-130, 0-260 or auxiliary. The auxiliary position supplies the necessary connections for using two amplifiers to gen-

erate three-phase-wye output power, or tandem output connections using two amplifiers in series for two times the output power single phase. Output power of both units is available at the output power terminal block located on the rear of the chassis, and at the red and white binding posts on the front panel.

1-12. The Elgar Plug-In Oscillator module (supplied separately) mounts in the blank space located on the front panel of both power sources. In most cases, however, the power source 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.

1-13. The grill assemblies located on the front panel and rear panel provide the fan 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 power source may occur.

1-14. PERFORMANCE SPECIFICATIONS

1-15. The performance specifications for the Model 251 and 501A appear in Tables 1-1 and 1-2, respectively. A graph illustrating output power de-rating appears in Figure 1-1, while still another graph illustrating the typical harmonic distortion of both power sources at rated power appears in Figure 1-2.

1-16. SYSTEM APPLICATIONS

1-17. The Models 251 and 501A can be connected in two's or three's with a common oscillator to provide double power, single-phase, two-phase and three-phase power. The various standard system model numbers available are as follows:

1-18. Model 251 Systems

1. System 500-1

This system consists of (2) Model 251's, (1) Model 400BT Signal-Routing Plug-In and (1) interconnecting cable. Not included with the system but necessary to complete it, is (1) 400(T) plug-in oscillator. This system provides 500VA single-phase, output power, at 65VAC, 130VAC, or 260VAC output voltage.

2. System 500-2

This system consists of (2) Model 251's (1) 400B Signal-Routing Plug-In, and (1) interconnecting cable. Not included with the system, but necessary to complete it, is (1) Elgar 2-phase plug-in oscillator. This system provides 250VA output power per phase at 32VAC, 130VAC or 260 VAC output voltage.

3. System 500-3D

This system consists of (2) Model 251's, (1) Model 400B Signal-Routing Plug-In, and (1) interconnecting cable. Not included with the system but necessary to complete it, is (1) Elgar 3-phase plug-in oscillator. This system is connected in a 3-phase, open-delta configuration. The output power per phase is 166 VA at 32 VAC, 130VAC or 260VAC output voltage.

4. System 500-3Y

This system consists of (2) Model 251's, (1) Model 400B Signal-Routing Plug-In, and (1) interconnecting cable. Not provided with the system, but necessary to complete it is (1) Elgar 3-phase plug-in oscillator. This system is connected in a 3-phase, phantom-wye configuration. The output power per phase is 166VA at 32VAC, 130VAC or 260VAC output voltage.

5. System 750-3

This system consists of (3) Model 251's, (1) Model 400B, (1) Model 400C, and (1) interconnecting cable. Not provided with the system, but necessary to complete it is (1) Elgar 3-phase plug-in oscillator. This system is connected in a three ampli-

Table 1-1. Model 251 Performance Specifications.

OUTPUT		
Power: (VA)	250	
Power Factor @ Full VA	± 0.7	
Voltage Ranges (VRMS)	0-32, 0-130, 0-260	
Frequency Range (Hz)	45-10000	
Distortion % @ FL —	45-200 Hz	0.6
	200-1000 Hz	0.4
	1000-5000 Hz	0.6
	5000-10000 Hz	0.9
INPUT		
Voltage (VAC)	115 or 230	
Phase	Single	
Frequency (Hz)	47-63	
Power (approx. max. W.)	800	
PHYSICAL		
Height (in & mm)	5.25	133
Width (in & mm)	19	482
Depth (in & mm)	16	406
Weight, net (lbs. kg.)	70	32
shipping (lbs. kg.)	80	36

Table 1-2. Model 501A Performance Specifications

OUTPUT		
Power: (VA)	500	
Power Factor @ Full VA	± 0.7	
Voltage Ranges (VRMS)	0-65, 0-130, 0-260	
Frequency Range (Hz)	45-5000	
Distortion % @ FL —	45-200 Hz	0.6
	200-1000 Hz	0.4
	1000-5000 Hz	0.6
	5000-10000 Hz	0.9
INPUT		
Voltage (VAC)	115 or 230	
Phase	Single	
Frequency (Hz)	47-63	
Power (approx. max. W.)	1700	
PHYSICAL		
Height (in & mm)	7	178
Width (in & mm)	19	482
Depth (in & mm)	17	432
Weight, net (lbs. kg.)	100	46
shipping (lbs. kg.)	115	52

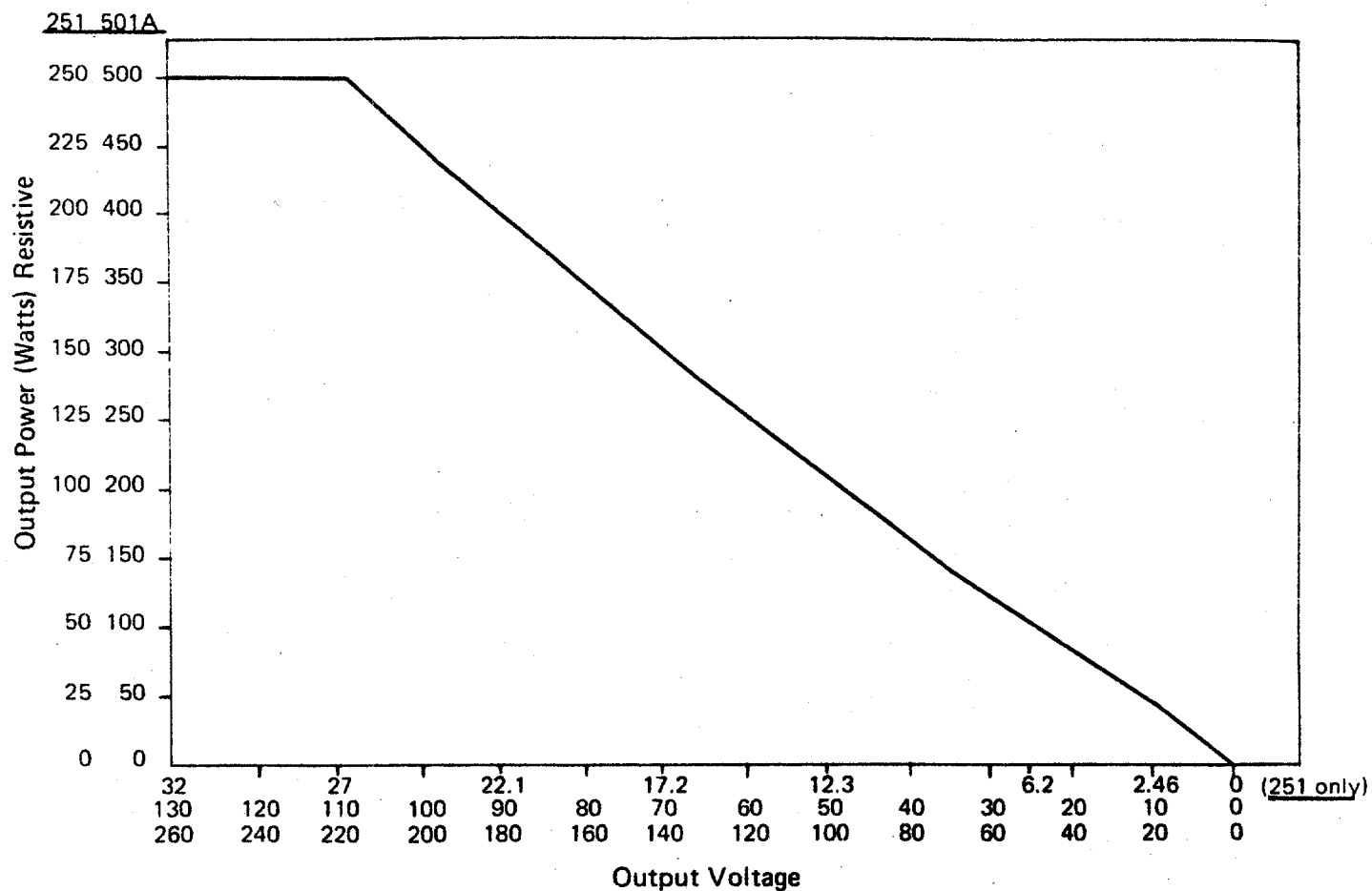


Figure 1-1. Power Output Derating

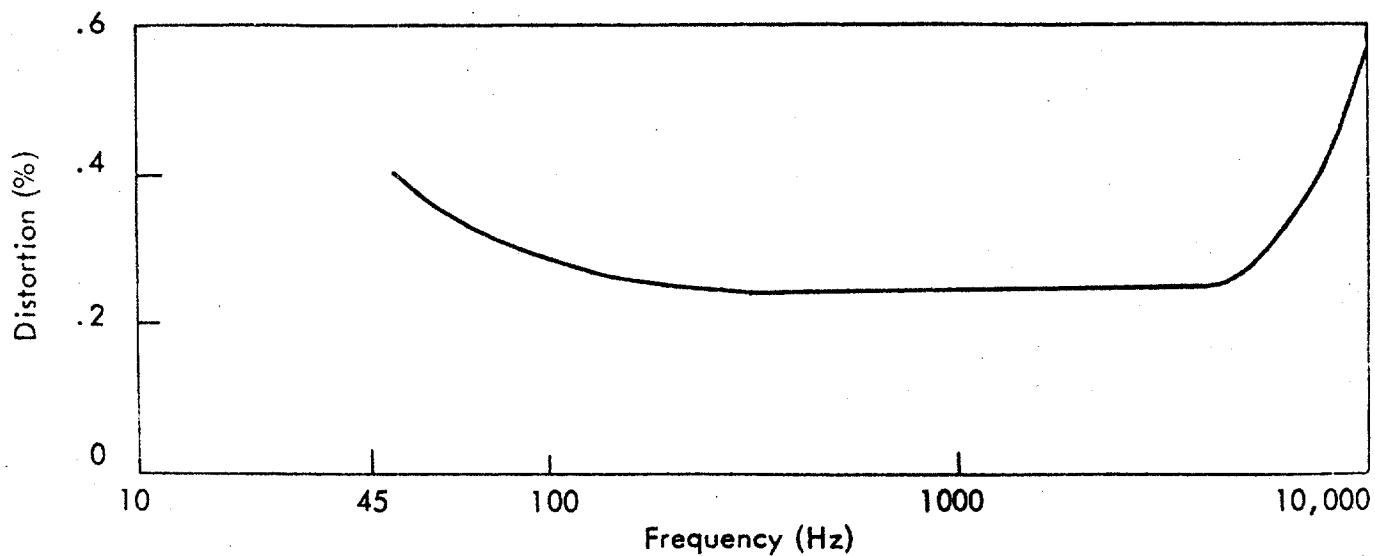


Figure 1-2. Typical Harmonic Distortion at Rated Power