

# 1 OVERVIEW

## 1.1 Introduction

The Elgar EW 3001 AC Power Source is a highly efficient AC Power Source providing sine wave output of low distortion. The microprocessor-controlled sine wave oscillator generates accurate and stable output voltage and frequency. The PWM (Pulse Width Modulation) approach of the power stage provides full volt-ampere and current rating to loads. The EW 3001 supplies power up to 3000 VA.

The Elgar EW 3001 AC Power Source is considerably smaller, lighter and more efficient than traditional power supplies with similar capability of outputting power.

This manual includes the specifications, installation procedures, operation and programming instructions for the EW 3001 Power Source.

## 1.2 Features

### Configuration

- Local operation through the keypad on front panel.
- Remote operation through GPIB or RS-232C interface.
- Protection against over power, over current, over temperature, under voltage, fan failure, and open circuit.
- Temperature-controlled fan speed.
- Built-in output isolation relays.

### Input/Output

- Selective full scale output: 150V/300V Auto.
- Remote control by analog voltage reference.
- Measurement of V, F, PF, CF, I, P.
- Programmable limit of output Irms.

## 1.3 Specifications

The operational specifications of the Elgar EW 3001 are listed below. All specifications are tested according to the standard Elgar test procedures.

All specifications are based on a full rated power resistive load at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$  specified otherwise.

Maximum distortion applies from half range to full range of the selected output voltage range with a resistive load.

### 1.3.1 Input

<u>Parameter</u>	<u>Units</u>	<u>Value</u>
Voltage	Volts AC RMS	190-250, 1 Phase
Connector Type		3 pin Terminal Block
Power Factor	N/A	0.98 minimum at nominal input voltage (220-230VAC)
Current, Inrush	Amperes, Peak	80 typical
Current	Amperes RMS	23 maximum
Frequency	Hz	47 to 63 minimum
Efficiency	N/A	80% typical

### 1.3.2 Output

<u>Parameter</u>	<u>Units</u>	<u>Value</u>
Power, Reactive	Volt amperes, RMS	3000 minimum
Voltage Programming Range	Volts RMS	Range 1 - 1 maximum to 150 minimum, Range 2 - 2 maximum to 300 minimum
Current Programming Range	Amperes RMS	Range 1 - 0 to 30 minimum, Range 2 - 0 to 15 minimum
Voltage Programming Accuracy (GPIB/RS-232/Front panel)	Percent of full scale	0.2% maximum for output $\leq$ 200 Hz, 0.4% maximum for output $>$ 200 Hz

<b><u>Parameter</u></b>	<b><u>Units</u></b>	<b><u>Value</u></b>
Voltage Programming Resolution (GPIB/RS-232/Front panel)	Volts AC RMS	0.1 maximum
Voltage Programming Accuracy (Analog)	Percent of full scale	0.4%
Voltage Drift, excluding external analog control	Percent per degree Celsius	0.1% maximum
Inductive Output Impedance	Mh	250 maximum
Resistive Output Impedance	Ohms	0.25 maximum
Load Transient Recovery	Seconds to 75% of final value	0.5 maximum
Noise	dB below full scale	45 minimum (measured at 60Hz)
Distortion	Percent THD	0.5% maximum for output of $\leq 500\text{Hz}$ and linear load 1.0% maximum for output of $> 500\text{Hz}$ and linear load
Line Voltage Regulation	Percent	0.1% maximum of full scale
Load Voltage Regulation	Percent	0.1% maximum of full scale at point of sense
Current Crest Factor	N/A	3.0 minimum for output $\leq 100\text{ Hz}$ , 2.5 minimum for output $> 100\text{ Hz}$
Frequency Range	Hz	45 to 1000 minimum
Frequency Drift	ppm per °C of programmed value	50 maximum
Frequency Programming Accuracy (GPIB/RS-232/front panel)	Percent of programmed value	0.1 maximum
Frequency Programming Resolution (GPIB/RS-232/front panel)	Hz	0.1 maximum

### 1.3.3 Front Panel Display

<b><u>Parameter</u></b>	<b><u>Units</u></b>	<b><u>Value</u></b>
Output Voltage Accuracy	N/A	0.3% of full scale + 0.2% of reading maximum
Output Voltage Resolution	Volts RMS	0.1 maximum
Output Current Accuracy	N/A	0.3% of full scale + 0.5% of reading maximum
Output Current Resolution	Amperes RMS	0.01 maximum
Output Power Range	Watts	0 to 3000 minimum
Output Power Accuracy	percent of full scale	2.5 maximum
Output Power Resolution	Watts	0.1 maximum
Crest Factor Accuracy	N/A	1% of full scale maximum for output > 1500VA
Power Factor Accuracy	N/A	1% of full scale maximum for output 1500VA
Frequency Accuracy	percent of reading	0.25%

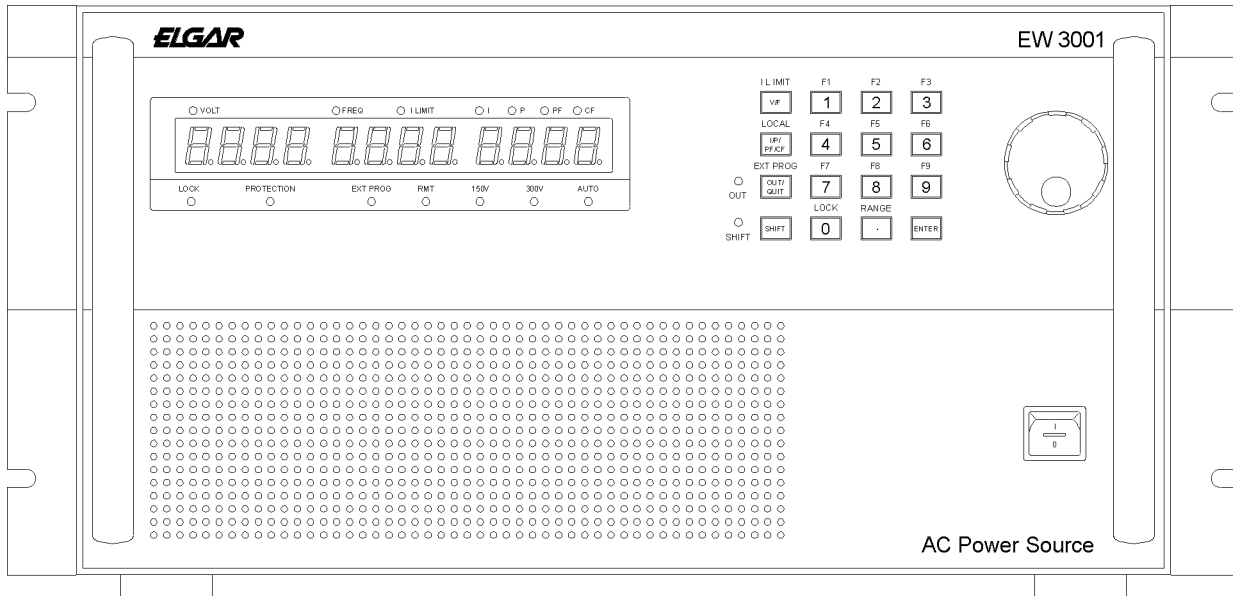
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### 1.3.4 GPIB/RS-232 Readback

<u>Parameter</u>	<u>Units</u>	<u>Value</u>
Output Voltage Accuracy	N/A	0.3% of full scale + 0.2% of reading maximum
Output Voltage Resolution	Volts RMS	0.1 maximum
Output Current Accuracy	N/A	0.3% of full scale + 0.5% of reading maximum
Output Current Resolution	Amperes RMS	0.01 maximum
Output Power Range	Watts	0 to 3000 minimum
Output Power Accuracy	percent of full scale	2.5 maximum
Output Power Resolution	Watts	0.1 maximum
Crest Factor Accuracy	percent of reading	1 maximum with output > 1500VA
Power Factor Accuracy	percent of reading	1 maximum with output > 1500VA
Frequency Accuracy	percent of reading	0.25








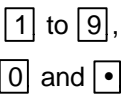
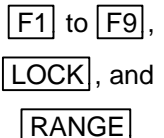






## 1.4 Operational Panels

### 1.4.1 The Front Panel



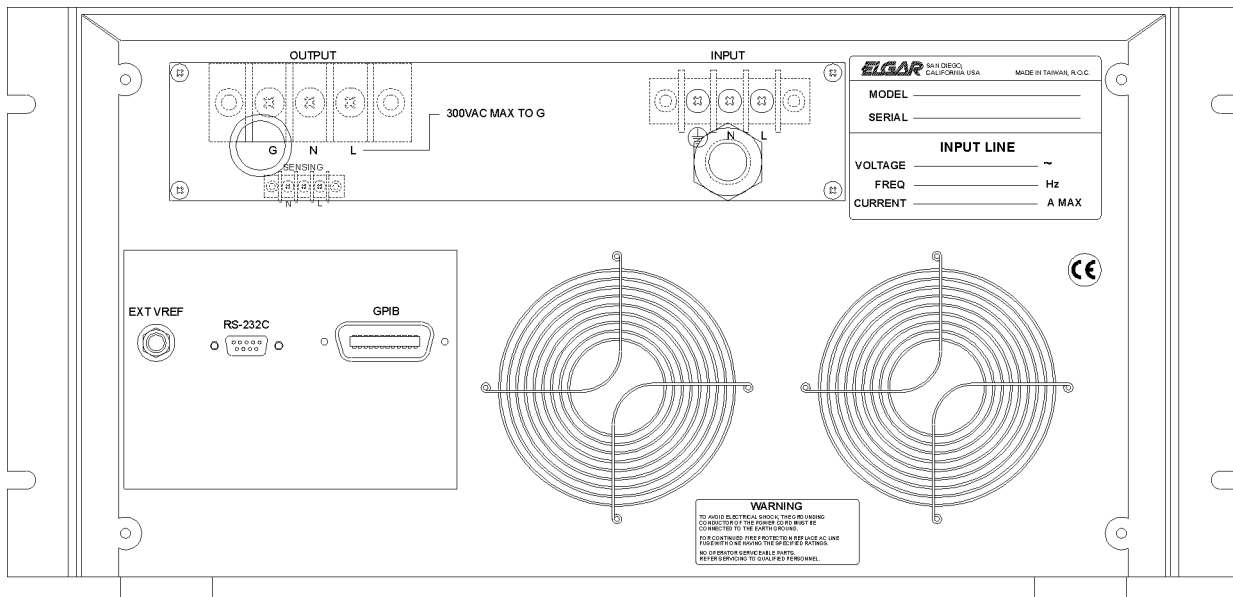
**Figure 1-1 Front Panel**

Item	Symbol	Description
1		<b>Alphanumeric LEDs:</b> A row of red 7-segment LEDs display setup messages and numeric settings or measurement results. The display area is divided into three sections; values of V appear on the left, frequency or I limit appears in the middle, and any of I/P/PF/CF measurement values appear on the right.
2		<b>Indicator LEDs:</b> LEDs located on the upper and lower part of the display panel are the indicators showing the activated status. These indicators include “VOLT”, “FREQ”, “I LIMIT”, “I”, “P”, “PF”, “CF”, “LOCK”, “PROTECTION”, “EXT PROG”, “RMT”, “150V”, “300V”, “AUTO”.  The “OUT” and “SHIFT” LEDs are located next to the corresponding keys on the keypad. When illuminated, they indicate activation of output and shift modes.

Item	Symbol	Description
3	 ----- or ----- 	<b>V/F or I limit selection key:</b> In normal mode, this key allows you to program either voltage or frequency. In shift mode, this key allows you to program the rms (root mean square) limit on the output current.
4	 ----- or ----- 	<b>I/P/PF/CF selection key:</b> In normal mode, repeatedly press this key to cycle through and select one of the measurement values. In shift mode, this key returns control from the remote PC to the front panel keypad.
5	 ----- or ----- 	<b>OUT/QUIT command key:</b> In normal mode, press this key to enable the EW to output power to the load. During setup procedures, use this key to quit the current setup routine. In shift mode, this key enables external programming.
6		<b>Shift mode selection key:</b> Press this key to switch the EW from the normal operational mode to the shift mode, or from shift back to normal.
7	 ----- or ----- 	<b>Numeric and decimal keys:</b> In normal mode, use these keys to program numeric data. In shift mode, use the keys from  to  to save data into or recall data from memory channels F1 to F9 respectively. Additionally, in shift mode,  enables data lock and configuration setup, and  allows programming of the full range of output voltage.
8		<b>Enter key:</b> Press this key to confirm parameter settings.
9		<b>Rotary knob:</b> Turn the rotary knob to input programming data or select options.
10		<b>Main Power Switch:</b> Power on/off the EW 3001 by this switch.

**Table 1-1 Front Panel Description**

### 1.4.2 Rear Panel



**Figure 1-2 Rear Panel**

Item	Name	Description
1	Series No. Label	Each set of the EW 3001 instruments has its own identification number and input rating marked on this label.
2	Output Terminal Block	Power line output is connected to the EW 3001 through this connector.
3	Power Line Input Terminal Block	Power line input is connected to the EW 3001 through this connector.
4	Cooling Fan	Cooling fan speed automatically increases or decreases as temperature rises or falls.
5	Ext. V Ref.	Control the output Vrms of the EW 3001 by external DC voltage level. Such signal is input through this BNC connector. <b>NOTE:</b> This connector is optional.
6	GPIB Connector	The interface allows the EW 3001 to communicate with the remote GPIB controller. <b>NOTE:</b> This connector is optional.
7	RS-232C Connector	This port located on the same GPIB optional board offers an alternative interface to the EW 3001 for remote operation. <b>NOTE:</b> This connector is optional.

**Table 1-2 Rear Panel Description**