1.1 INTRODUCTION

The Elgar Model PIP 704 Plug-In Programmer (PIP) provides the following capabilities:

- Full Automatic Test Equipment (ATE) Qualification for ATLAS Based Language Extension (ABLE).
- 100% Control of AC Power Source.
- General Purpose Interface Bus (GPIB) and Front Panel Control.
- Extensive Display Supports Programming, Status Indications, and Fault Indications.
- Built-in Test and True Readback of AC Power Source.
- Automatic Control of AC Power Source Range and Disconnect Relays.

1.2 GENERAL DESCRIPTION

The Elgar Models PIP 704-3 and PIP 704-3T are plug-in programmable oscillator test modules specifically designed for use with Elgar AC Power Sources. The PIP 704 is a solid state instrument intended for use in ATE systems. In response to digitally coded command inputs from a system controller, the PIP produces output signals which are, in turn, inputs to AC Power Sources.

The PIP 704 programs Frequency, Independent Amplitudes, Total Harmonic Distortion (to 8% THD) and Phase Angles of a three-phase power source.

The PIP 704-3T also has a built-in measurement system that is capable of measuring the following:

- Output voltage;
- Load current;
- Load watts;
- Frequency; and,
- Phase angle

of its associated AC Power Source.

Appendix A provides a listing of acronyms commonly used in this manual and Appendix B provides a listing of the commonly used IEEE-488 interface connections.

NOTE

The PIP 704 is not recommended for use with Elgar "C" Series Power Sources due to isolation problems.

1.3 PHYSICAL DESCRIPTION

The PIP 704 is contained in a rectangular module approximately 7-1/4" wide, 3-1/2" high, and 8" deep and is specifically designed to fit the standard oscillator cavity of all Elgar AC Power Sources. Electrical connections are made as the PIP is inserted into the appropriate Elgar AC Power Source.

Connections for sense lines and GPIB interface are connected through the rear panel of the AC Power Source (the PIP 704 is not suitable for use as a stand-alone device).

1.4 SPECIFICATIONS

1.4.1 General

Input Power: 117 VAC, +42 VDC and -42 VDC from the associated AC Power Source.

Output Signal: 0 to 2.5 VAC to an 800 Ω load (per phase).

Operating Temperature Range: 0°C to 50°C (32°F to 122°F).

Programming: Front panel keyboard/display (local) and GPIB IEEE-488-1978 (remote).

Distortion (THD): <1% within power source range.

Control: Front panel keyboard/display (local) and GPIB (IEEE-488-1978) via ABLE language (remote).

1.4.2 Frequency

Range: 45 Hz to 999.9 Hz in 0.1 Hz steps.

Accuracy: 0.001% of programmed value.

Temperature Coefficient: 0.003% per °C average.

Settling Time: 1/2 cycle, or less, at new frequency.

1.4.3 Amplitude

Range: 0 to 200 VAC in 0.1 VAC steps (0-135/0-270 VAC via internal range switch on PIP 704-1-106 and PIP 704-3-105).

Accuracy: ±0.15% of Full Scale (45 Hz to 999.9 Hz) from 5% of Full Scale to Full Scale.

Temperature Coefficient: ±0.01% per °C average.

Line Regulation: ±0.01% for a 10% line change within line operating range.

Load Regulation: ±0.01% full wave average at point of sense, no load to full load.

Settling Time: <50 msec when programming from >5% of Full Scale.

1.4.4 Phase Angle

Resolution: 0° to 399° in 0.5° steps.

Accuracy: ±1° from 45 Hz to 999.9 Hz.

1.4.5 Current Limit
(With Test Option Only)

Range: 5% to 100%.

Resolution: 0.01 Ampere.

Accuracy: ±1% of Full Scale ±0.5% of Reading.

Crest Factor: 3.5:1 minimum.

Temperature Coefficient: ±0.02% of Full Scale ±0.02% of Reading per °C average.

1.4.6 Measurement System

Voltage

Range:	0 to 300 VRMS
Resolution:	0.1 VRMS from 0 to 300 VRMS
Accuracy:	±0.1% of Full Scale ±0.1% of Reading
Temperature Coefficient:	±0.01% of Full Scale ±0.01% of Reading per °C average

Current

Range:	5A, 10A, 20A, 40A (jumper selected)
Resolution:	0.01 Amperes
Accuracy:	±1% of Full Scale ±1% of Reading
Crest Factor:	3.5:1 minimum
Temperature Coefficient:	±0.02 of Full Scale ±0.02% of Reading per °C average

Power

Range:	500W, 1KW, 2KW and 4KW (jumper selected)
Resolution:	1 Watt
Accuracy:	±1% of Full Scale ±1% of Reading
Temperature Coefficient:	±0.01% of Full Scale ±0.02% of Reading per °C average

Frequency

Range:	45 to 999.9 Hz
Resolution:	1 Hz
Accuracy:	±1 digit (1 Hz)
Temperature Coefficient:	±1 digit (1 Hz), 0°C to 50°C (32°F to 122°F)

Phase Angle

Range:	0° to 360°
Resolution:	0.5°
Accuracy:	±2° for programmed voltages of 50 VAC and higher. Accuracy is degraded at voltages below 50 VAC.

1.4.7 Synchronization Pulse Output

A sync pulse is available at the rear panel connector J1 of the associated AC Power Source. This pulse goes low at the start of any programmed aberration for synchronizing test equipment. This pulse is located at pin 6 of J1 referenced to pin 1 of J1. The sync pulse is an open collector with a 3.3 kΩ pull-up.

1.4.8 Amplitude Modulation Input

To modulate the output of the AC Power Source with an analog signal, apply a voltage to pin 7 with common to pin 1 of J1 on the rear of the associated AC Power Source. The input impedance for this input is 10 kΩ minimum. The scaling for this input is 1% per VDC or peak VAC. Maximum input is 10 VDC or peak VAC which provides up to 10% modulation. Frequency should be held to no more than 30 Hz. There is no disable on this input so, if not in use, pin 7 should be shorted to pin 1 on J1 of the associated AC Power Source.

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.