



SECTION I

GENERAL DESCRIPTION

1.1 INTRODUCTION

This instruction manual contains information on the installation, operation, calibration and maintenance of the California Instruments XP Series AC Power Sources Model 321XP, 651XP, 971XP and 1301XP.

1.2 SPECIFICATIONS

Table 1-1 contains the operating specifications for XP Series power sources. All specifications are tested in accordance with standard California Instruments test procedures and apply with a stable, low distortion input signal as generated by any XP-series oscillator/power controller. The following specifications apply for operation from 78% to 100% of full scale output voltage.

**TABLE 1-1 SPECIFICATIONS
 XP-SERIES POWER SOURCE**

MODEL	321XP	651XP	971XP	1301XP
MAXIMUM OUTPUT POWER, VA				
@ TA=25 degrees C, 77.8% of Range 0.7 Power Factor	325	650	975	1,300
@ TA=25 degrees C, 100% of Range 0.7 Power Factor	419	836	1,252	1,671
@ TA=55 degrees C, 77.8% of Range 0.7 Power Factor	250	500	750	1,000
@ TA=55 degrees C, 100% of Range 0.7 Power Factor	321	642	964	1,285
MAXIMUM OUTPUT CURRENT, Arms				
@ TA=25 degrees C				
67.5 Volt Range	6.19	12.38	18.56	24.76
135 Volt Range	3.10	6.19	9.28	12.38
270 Volt Range	1.55	3.10	4.64	6.19
@ TA=55 degrees C				
67.5 Volt Range	4.76	9.52	14.28	19.04
135 Volt Range	2.38	4.76	7.14	9.52
270 Volt Range	1.19	2.38	3.57	4.76

OUTPUT VOLTAGE RANGES: 0-135 volts rms
0-270 volts rms

OPTIONAL: 0-67.5 volts rms
0-135 volts rms

Voltage range selectable by front panel range key or via IEEE-488 bus when used with the XP-series programmable oscillators/AC power controllers.

LOAD REGULATION: $\pm 1\%$ over the range from 45 Hz to 5 KHz when tested at unity power factor.

TOTAL HARMONIC DISTORTION: Less than 0.5% from 45 Hz to 5 KHz.

LINE REGULATION: $\pm 0.1\%$ of full output for a $\pm 10\%$ line change.

AMPLITUDE STABILITY: $\pm 0.25\%$ for 24 hours at constant line, load and ambient temperature.

FULL POWER FREQUENCY RANGE: 45 Hz to 5 KHz (Optional 15 Hz at derated power, 33% voltage and 30% power).

FREQUENCY RESPONSE: $\pm 0.5\text{dB}$ 45 Hz to 5 KHz.

PHASE MATCHING: ± 1.5 degrees 45 to 2KHz.
(Between identical power source models) $\pm .5$ degree/KHz. Does not include phase inaccuracy of oscillator drive signals.

EFFICIENCY:

321XP	651XP	971XP	1301XP
43%	52%	55%	53%

at full power out at 135V at unity power factor

AC NOISE LEVEL: 70dB rms below full rms output with shorted input.

60dB below full peak-to-peak output with shorted input.

50dB below full peak-to-peak output at full rated power output.

OVERLOAD/SHORT CIRCUIT
OVERPOWER PROTECTION:

A fault resulting from overloading, short circuit or overpower condition will cause an "OVERLOAD" indicator to illuminate on the front panel. The output voltage will then be clipped on the peaks. Clipping will be proportional to the amount of the overload.

OVERTEMPERATURE
PROTECTION:

Thermal overload resulting from excessive heatsink temperature will cause an "OVERTEMP" indicator to illuminate on the front panel and the output voltage will drop to zero.

AMPLIFIER DRIVE:
(normally obtained from
plug-in oscillator through
Power Monitor)

5 volts rms (typical) produces full scale output.

PROGRAMMABLE CURRENT
LIMIT OPTION:

Current Limit programming is in peak amperes. The accuracy is $\pm 5\%$ of programmed value from 10% to 100% of rated output.

AC MAINS INPUT:

Models 321XP and 651XP normally wired for 103 to 135 VAC. Models 971XP and 1301XP normally wired for 180 to 253 VAC.

The AC INPUT may be rewired for any of the three input ranges, 103 to 135 VAC, 180 to 253 VAC or 207 to 270 VAC. NOTE: When rewired the AC input check Table 2-3 for the correct circuit breaker.

AC MAINS FREQUENCY:

48 Hz to 65 Hz.

OPERATING TEMPERATURE RANGE:

0 to 55 degrees C.

STORAGE TEMPERATURE RANGE:

-25 degrees to 85 degrees C.

ACOUSTIC NOISE:

Less than 60 dB maximum when mounted in equipment rack measured three feet from front center, "A" weighted scale.

FRONT PANEL METER: (For Power Monitor specifications, refer to applicable Power Monitor Instruction Manual)	Monitors output voltage or load current. Resolution is 1 volt or 0.1 ampere. With "kiloWatts" option resolution is 10 watts.
FRONT PANEL INDICATORS:	"POWER ON" "RANGE" "OVERLOAD" "OVERTEMP"
FRONT PANEL CONTROLS:	
Amplifier:	Main Circuit Breaker
Power Monitor:	Range; IMB, IMC Volts; IMB, IMC Amp; IMB, IMC KiloWatt; IMC
INPUT/OUTPUT CONNECTORS:	AC MAINS INPUT provided on rear mounted terminal block, Kulka 9-85-3. Output provided on rear mounted terminal block, Kulka 9-85-3. Output provided on rear mounted terminal block, Kulka 9-85-3. Output provided on rear mounted terminal block, Kulka 9-85-3. Output provided on rear mounted terminal block, Kulka 9-85-3. Servo Sense inputs for individual phases provided on Amp cap 1-480701-0 w/Amp Socket Contact 350689-1. The mating connector is Amp plug 1-480700-0 w/Amp contact pin 350547-1. Interfacing in a multi-phase system is provided with the California Instrument cable assembly 4000-427. The power source connector is Amp 552118-1. The mating connector is Amphenol 57-20500-15.

INPUT/OUTPUT CONNECTORS:
(continued)

Oscillator/Control signals for
programmable oscillators are
provided on rear mounted IEEE-488
(GPIB) connector 3M 3549-1000.

DIMENSIONS:
(in inches)

1301XP - 19W - 22D - 7.00H
971XP - 19W - 22D - 7.00H
651XP - 19W - 22D - 5.25H
321XP - 19W - 22D - 5.25H

NET WEIGHT:

1301XP 103 Pounds
971XP 92 Pounds
651XP 78 Pounds
321XP 59 Pounds

SHIPPING WEIGHT:

1301XP 131 Pounds
971XP 128 Pounds
651XP 114 Pounds
321XP 93 Pounds

FRONT PANEL FINISH:

Gray, 26440 per federal standard
595 with black silk-screened
lettering.