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SINCE 1975

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INSTRUCTIONS

MODEL AV-112A-PS

0 to ±200V, 300 kHz

VARIABLE-GAIN
LINEAR AMPLIFIER

SERIAL NUMBER: _____

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been dissembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

Phone: 613-226-5772 or 1-800-265-6681
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INTRODUCTION

The Model AV-112A-PS variable-gain linear amplifier accepts input voltages in the range of 0 to ±2V, and has a variable gain of +1 to +100. The maximum output voltage is ±200V. The AV-112A-PS will drive load impedances of 5 kΩ or higher.

HIGH-VOLTAGE PRECAUTIONS

⚠ **CAUTION:** This instrument provides output voltages as high as ±200 Volts, so extreme caution must be employed when using this instrument. The instrument should only be used by individuals who are thoroughly skilled in high voltage laboratory techniques. The following precaution should always be observed:

1) Keep exposed high-voltage wiring to an absolute minimum.

2) Wherever possible, use shielded connectors and cabling.

3) Connect and disconnect loads and cables only when the amplifier is turned off.

4) Keep in mind that all cables, connectors, oscilloscope probes, and loads must have an appropriate voltage rating.

5) Do not attempt any repairs on the instrument, beyond the fuse replacement procedures described in this manual. Contact Avtech technical support (see page 2 for contact information) if the instrument requires servicing.

SPECIFICATIONS

Model:	AV-112A-PS
Output Amp. (max):	± 200 Volts
Load impedance:	≥5 kΩ
Bandwidth (kHz):	300
Voltage gain (variable):	x1 to x100
Input range:	0 to ± 2 Volts (1 kΩ input impedance)
Rise time (for max output):	1.0 μs
Output power, max.	8 W
Connectors:	BNC
Power:	120/240 Volts (switchable) 50-60 Hz
Dimensions:	100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8")

INSTALLATION

VISUAL CHECK

After unpacking the instrument, examine to ensure that it has not been damaged in shipment. Visually inspect all connectors, knobs, and handles. Confirm that a power cord is with the instrument. If the instrument has been damaged, file a claim immediately with the company that transported the instrument.

PLUGGING IN THE INSTRUMENT

Examine the rear of the instrument. There will be a male power receptacle, a fuse holder and the edge of the power selector card visible.

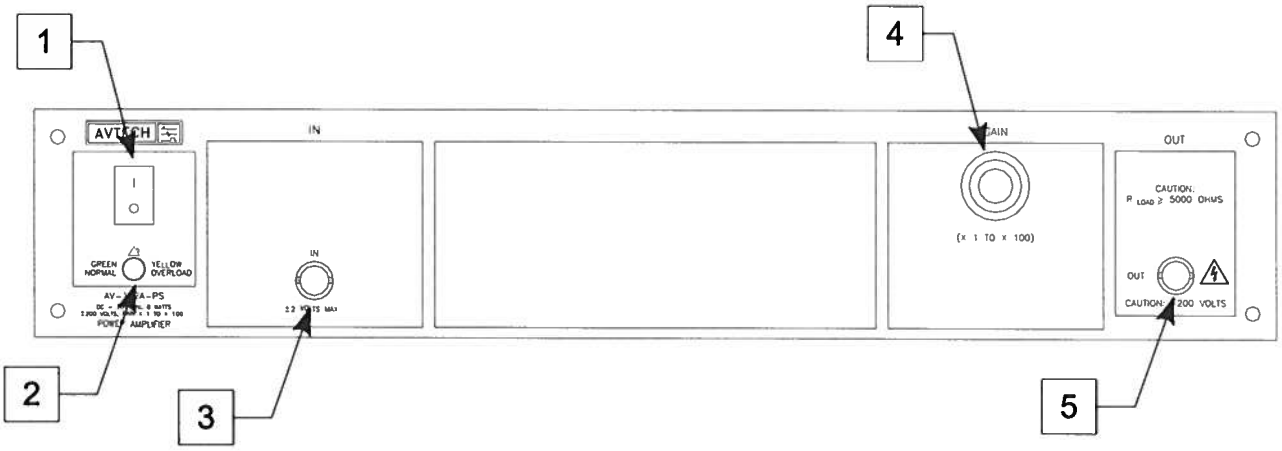
For AC line voltages of 110-120V, the power selector card should be installed so that the "120" marking is visible from the rear of the instrument.

For AC line voltages of 220-240V, the power selector card should be installed so that the "240" marking is visible from the rear of the instrument.

If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

In the 120V setting, a 1A slow blow fuse is required. In the 240V setting, a 0.5A slow-blow fuse is required.

FRONT PANEL CONTROLS



1. POWER Switch. This is the main power switch.

2. OVERLOAD Indicator. When the instrument is powered, this indicator is normally green, indicating normal operation. If this indicator is yellow, an internal automatic overload protection circuit has been tripped. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a very low impedance), the protective circuit will disable the output of the instrument and turn the indicator light yellow. The light will stay yellow (i.e. output disabled) for about 5 seconds after which the instrument will attempt to re-enable the output (i.e. light green) for about 1 second. If the overload condition persists, the output will be disabled again (i.e. light yellow) for another 5 seconds. If the overload condition has been removed, the instrument will resume normal operation.

   This overload indicator is only likely to come on in two situations:

   - Briefly at startup. This is not a cause for concern.
   - When the load impedance is too low (< 5 kΩ). In this case, turn off the instrument and connect the proper load.

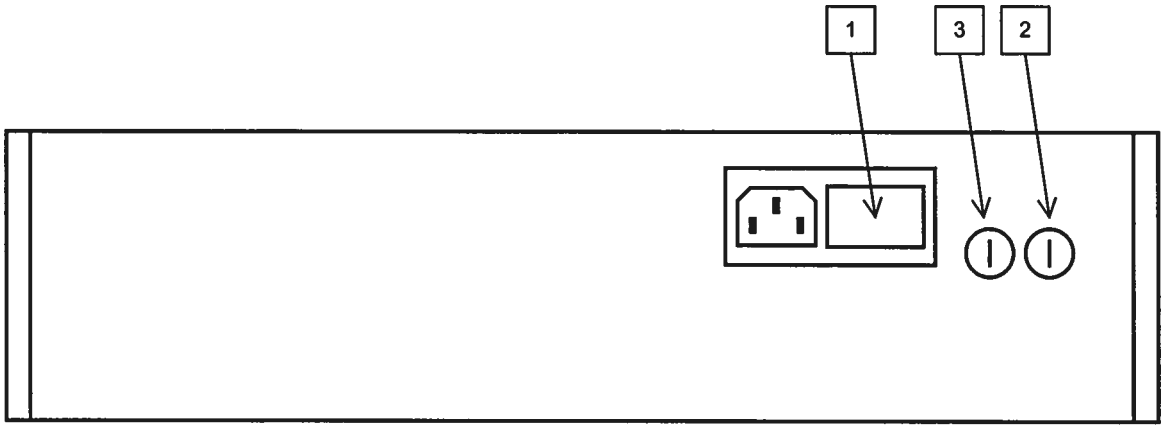
3. IN Connector. The input signal is applied to this connector. The input impedance is approximately 1 kΩ. The input must not exceed ±2V.

4. GAIN Dial. This ten-turn dial is used to vary the amplifier gain between +1 and +100.

5. OUT Connector. This BNC connector provides the main output signal. The output is an amplified version of the input on (3). The gain (V_{OUT}/V_{IN}) is controlled by (4).

   ⚠ Caution: Voltages as high as ±200V may be present on the center conductor of this output connector. Avoid touching this conductor. Connect to this connector using standard coaxial cable, to ensure that the center conductor is not exposed.

REAR PANEL CONTROLS



1. AC POWER INPUT. A three-pronged recessed male connector is provided on the back panel for AC power connection to the instrument. Also contained in this assembly is a slow-blow fuse and a removable power selector card that can be removed and repositioned to switch between 110-120V AC in and 220-240V.

   For AC line voltages of 110-120V, the power selector card should be installed so that the "120" marking is visible from the rear of the instrument.

   For AC line voltages of 220-240V, the power selector card should be installed so that the "240" marking is visible from the rear of the instrument.

   If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

   In the 120V setting, a 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow-blow fuse is required.

2. DC Fuse. This 2.5A slow-blow fuse protects the internal DC power supplies.

3. DC Fuse. This 2.5A slow-blow fuse protects the internal DC power supplies.

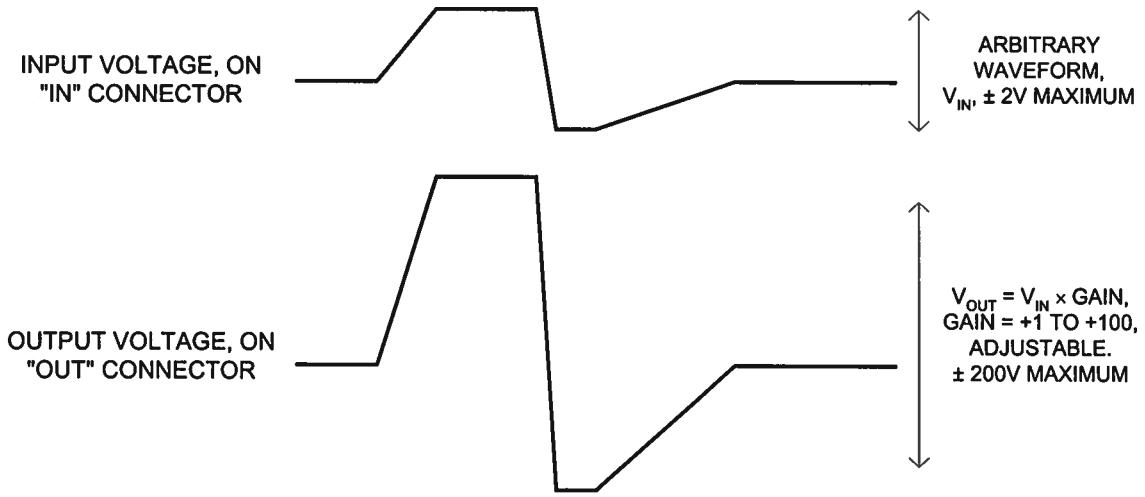
GENERAL INFORMATION

BASIC CONTROL

The AV-112A-PS is a DC-300 kHz variable-gain linear amplifier. The gain is variable from +1 to +100, and is adjusted by rotating the "GAIN" control.

The required voltage input signal is applied at the "IN" connector.

This mode is illustrated below:



MECHANICAL INFORMATION

TOP COVER REMOVAL

If necessary, the interior of the instrument may be accessed by removing the four Phillips screws on the top panel. With the four screws removed, the top cover may be slid back (and off).

Always disconnect the power cord before opening the instrument.

There are no user-adjustable internal circuits. For repairs other than fuse replacement, please contact Avtech (info@avtechpulse.com) to arrange for the instrument to be returned to the factory for repair.

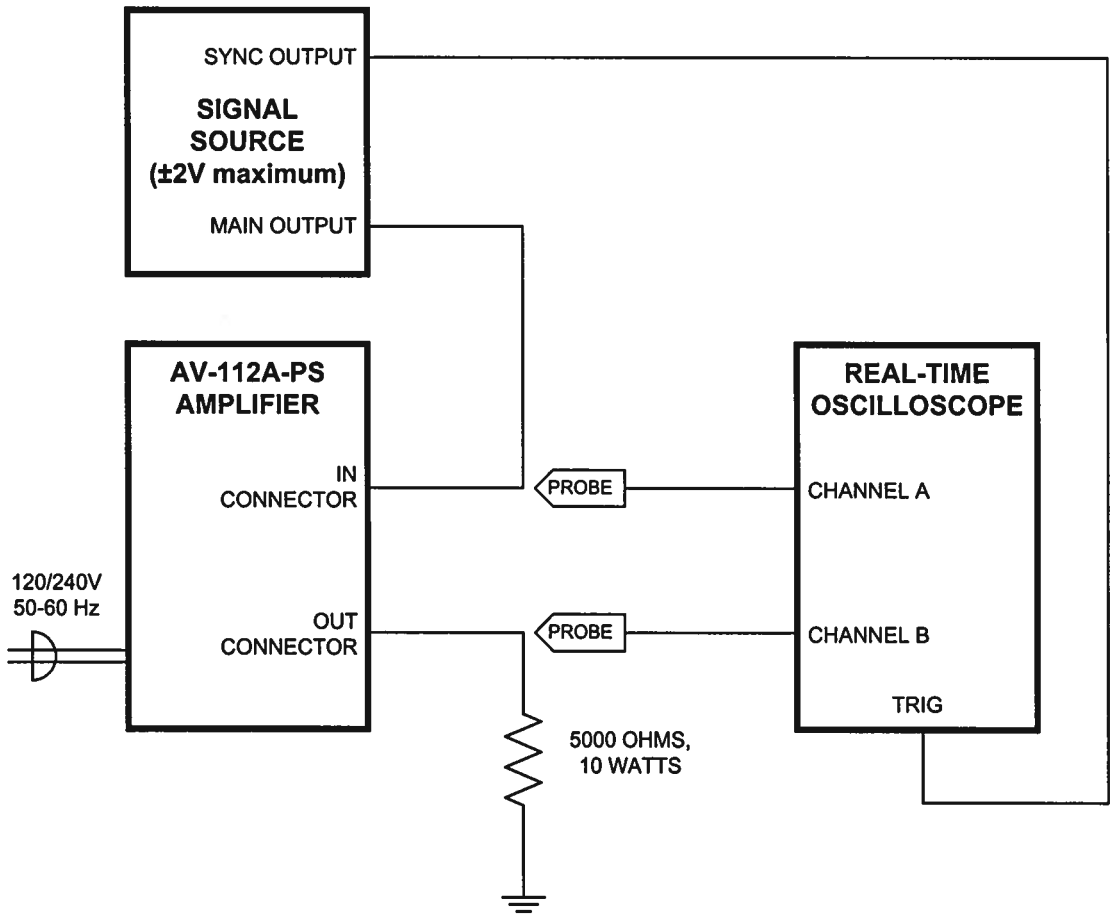
⚠ Caution: High voltages are present inside the instrument during normal operation. Do not operate the instrument with the cover removed.

RACK MOUNTING

A rack mounting kit is available. The -R5 rack mount kit may be installed after first removing the one Phillips screw on the side panel adjacent to the front handle.

OPERATIONAL CHECK

This section describes a sequence to confirm the basic operation of the instrument. It should be performed after receiving the instrument. It is a useful learning exercise as well.



Basic Test Arrangement

1) Connect a 5 kΩ, 10W test load between the OUT connector and ground. Confirm that the oscilloscope and the test load are rated for 200 Volt operation.

2) Set the signal generator to produce a ±2V, 25 kHz waveform. Connect a cable from the SYNC connector of the signal generator to the TRIG input of an oscilloscope. Set the oscilloscope to trigger externally. Connect the main output of the signal generator to the input of the amplifier.

3) Connect one oscilloscope probe (channel A) to the output of the signal generator. Set the Channel A vertical scale to 1 V/div.

4) Connect one oscilloscope probe (channel B) to the 5 kΩ load. On the oscilloscope, set the channel A vertical scale to 100 V/div, and the horizontal scale to 20 μs/div.

5) Set the gain control to minimum (0.0). Turn on the amplifier and the signal generator.

6) Channel A should show a ±2V, 25 kHz waveform from the signal generator. Rotate the gain control to its maximum setting. The Channel B waveform should increase to ±200V, and have a shape similar to that of the Channel A waveform.

7) This completes the operational check.

If additional assistance is required:

Tel: (613) 226-5772
Fax: (613) 226-2802
Email: info@avtechpulse.com

MAINTENANCE

REGULAR MAINTENANCE

This instrument does not require any regular maintenance.

On occasion, one or more of the rear-panel fuses may require replacement. All fuses can be accessed from the rear panel.

CLEANING

If desired, the interior of the instrument may be cleaned using compressed air to dislodge any accumulated dust. (See the "TOP COVER REMOVAL" section for instructions on accessing the interior.) No other cleaning is recommended.

May 13, 2003