

INSTRUCTIONS

MODEL AVR-3-PS-PN PULSE GENERATOR

S.N.:

## 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 disassembled, 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

Fax: 613-226-2802 or 1-800-561-1970

E-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)

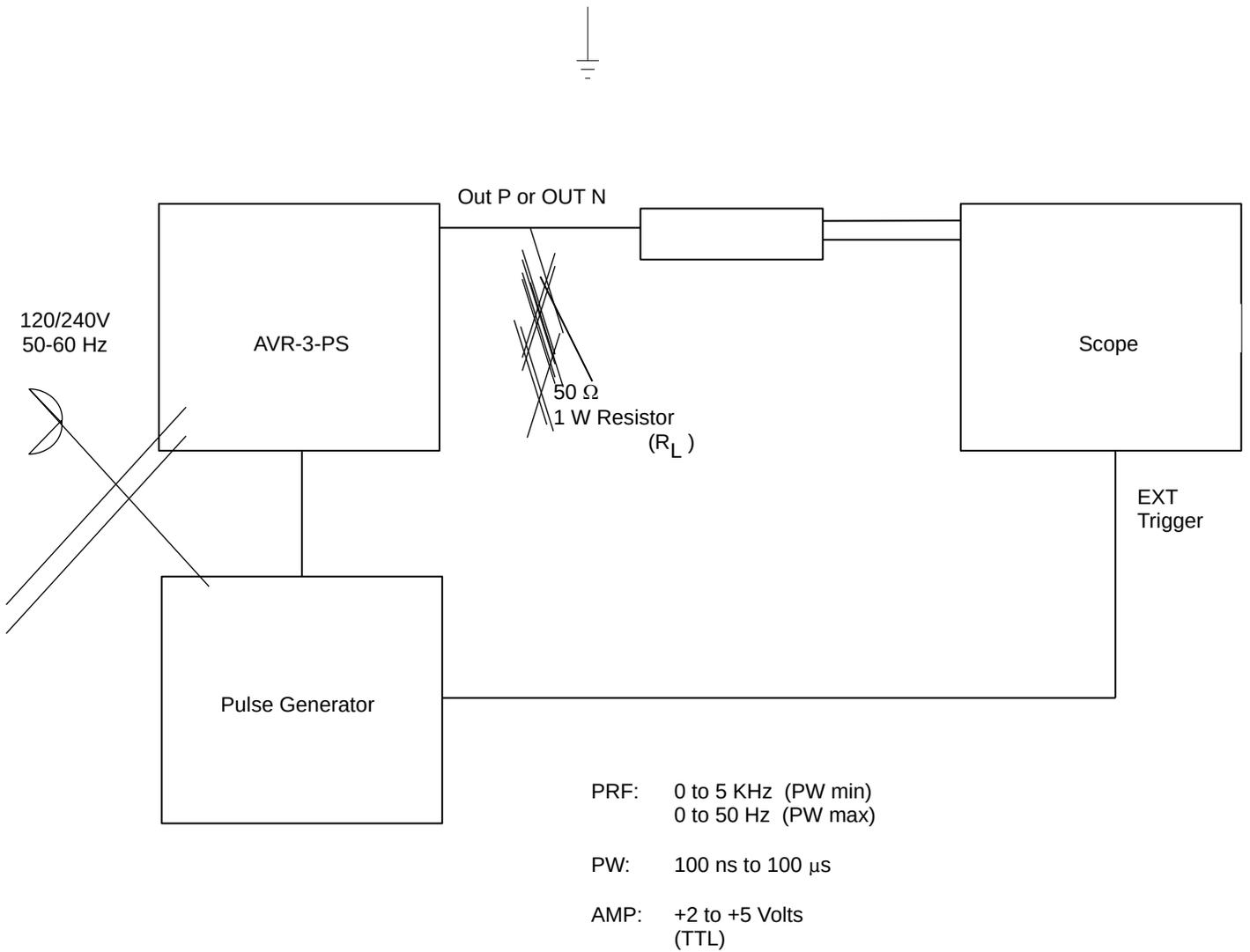
World Wide Web: <http://www.avtechpulse.com>



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FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



## GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.
- 2) The use of 60 db attenuator at the scope vertical input channel will insure a peak input signal to the scope of less than one volt (necessary only if sampling scope used). If a high impedance real time scope is used, the pulse generator should be terminated using a shunt 50 ohm resistor.
- 3) The desired output polarity is selected by means of the front panel POLARITY switch. With the POLARITY switch in the P position, the negative output pulse generator is rendered inactive. Likewise, with the POLARITY switch in the N position, the positive pulse generator is rendered inactive.
- 4) The output pulse width is equal to the input trigger pulse width. The minimum and maximum PW for each range and the corresponding maximum PRF are as follows. Note that the unit may fail if operated at duty cycles exceeding the above.

	PW min	PW max
Range 1	0.1 us PRF max 1 kHz	1.0 us PRF max 1 kHz
Range 2	1.0 us PRF max 1 kHz	10 us PRF max 500 Hz
Range 3	10 us PRF max 500 Hz	100 us PRF max 50 Hz

- 5) The output PRF is equal to the input trigger pulse PRF.
- 6) The output pulse amplitudes for the positive and negative outputs are controlled by means of the front panel one turn AMP P and AMP N control.
- 7) The AVR-3 features an output impedance of the order of several ohms (rather than 50 ohms). The following consequences of this feature should be noted:

- a) When used to switch some semiconductor devices (eg. bipolar and VMOS power transistors), the AVR unit will yield much faster switching times than those provided by 50 Ohm pulse generators.
- b) The AVR unit will safely operate in to load impedances in the range of 50 ohms to an open circuit. However, the fall time may degrade for load impedances higher than fifty ohms.
- c) The AVR unit may be effectively converted to a fifty ohm output impedance generator by placing a fifty ohm  $\frac{1}{2}$  watt carbon composition resistor in series with the output of the unit and the load. The maximum available load voltage will then decrease to 100 volts (from 200 volts).
- d) The output switching elements may fail if the unit is inadvertently operated into a short circuit. The switching elements are easily replaced in the field following the procedure outlined in the REPAIR Section.

FIG. 2: BACK PANEL CONTROLS

## BACK PANEL CONTROLS

- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse.

## SYSTEM BLOCK DIAGRAM AND REPAIR PROCEDURE

- 1) The AVR unit consists of four basic components or modules:
  - a) Metal Chassis
  - b) AC to DC power supply board
  - c) AVR-3-PG pulse generator modules (-P and -N)
  - d) AVR-3-PS power supply modules (-P and -N)

The modules are interconnected as shown above.

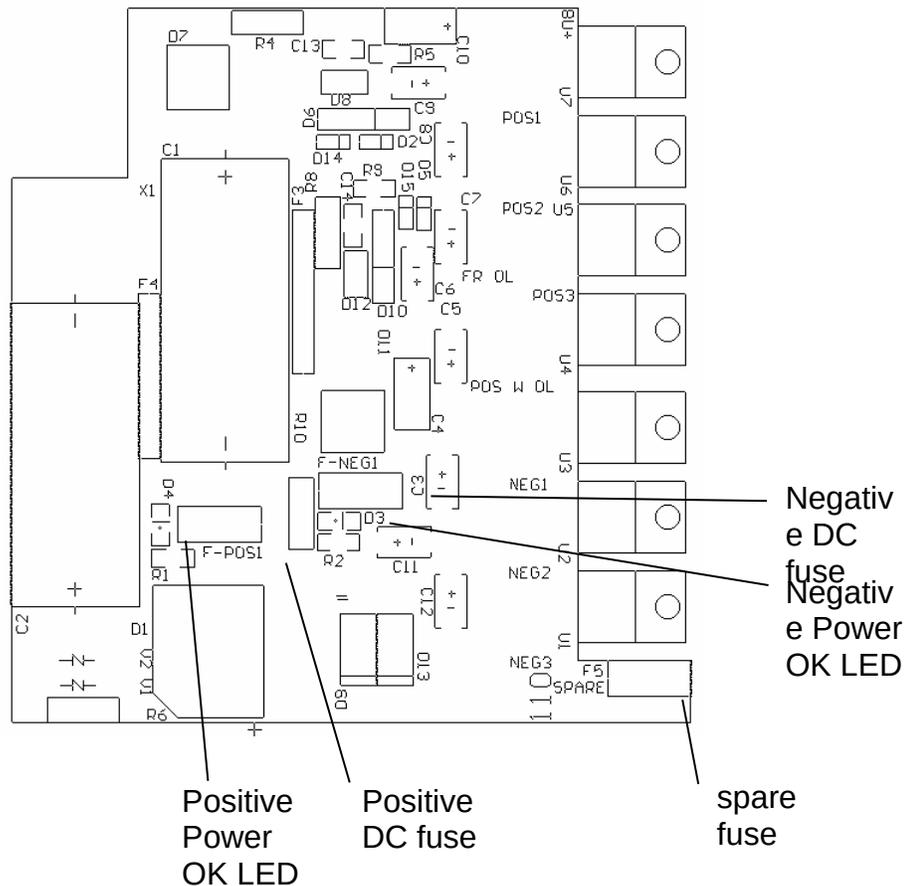
- 2) If the unit malfunctions, disconnect from the 60 Hz supply and the trigger source and remove the four Phillips screws on the back panel of the unit. With the screws removed, the top cover may be slid off.
- 3) Reconnect to the 60 Hz source and check the voltage on the line connecting to the +24 V pin of the AVR-PG module. A voltage of +24 Volts should be recorded. If the voltage is substantially less than +24 Volts, disconnect the 60 Hz source and disconnect the line from the +24 Volt pin. Connect a 50 Ohm 8 Watt resistance to the output of the AVR-PS module. Reconnect to the 60 Hz source and measure the voltage across this resistor. A voltage of +24 Volts should be indicated. If the voltage is substantially less than 24 Volts the AVR-PS module is defective and should be either repaired or replaced. If the measured voltage is equal to +24 Volts then the SL4H switching elements in the AVR-PG module have probably failed. The SL4H switching elements are easily replaced by removing the cover plate on the instrument bottom side and extracting the SL4H switching elements from their sockets using a pair of needle nose pliers. Before attempting this first insure that the prime power is off and also briefly ground the metal tabs on the SL4H elements to the chassis as the bypass capacitors may be charged to 225 Volts. Replacement SL4H units must be ordered directly from Avtech. When reinstalling the SL4H units in their

sockets, insure that the shortest of the three terminals is adjacent to the black dot on the AVR-PG chassis.

## POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three fuses (plus one spare). One, which protects the AC input, is located in the rear-panel power entry module, as described in the “Rear Panel Controls” section of this manual. If the power appears to have failed, check the AC fuse first.

The other two fuses (plus one spare) are located on the internal DC power supply, as shown below:



The spare fuse may be used to replace one of the other fuses, if required.

The three fuses on this circuit board are 0.5A slow-blow fuses, Littlefuse part number R452.500. (This fuse can be ordered from Digikey, [www.digikey.com](http://www.digikey.com). The Digikey part number is F1341CT-ND).

If you suspect that the DC fuses are blown, follow this procedure:

1. Remove the top cover, by removing the four Phillips screws on the top cover and then sliding the cover back and off.
2. Locate the two "Power OK" LEDs on the power supply circuit board, as illustrated above.
3. Turn on the instrument.
4. Observe the "Power OK" LEDs. If the fuses are not blown, the two LEDs will be lit (bright red). If one of the LEDs is not lit, the fuse next to it has blown.
5. Turn off the instrument.
6. If a fuse is blown, use needle-nose pliers to remove the blown fuse from its surface-mount holder.
7. Replace the fuse.

PERFORMANCE CHECK SHEET