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SINCE 1975

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## INSTRUCTIONS

MODEL AVX-D-PS-ED 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

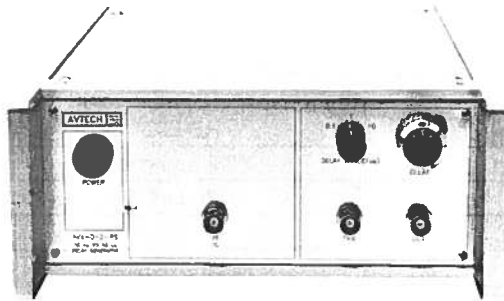
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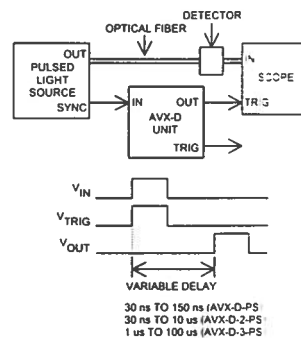
World Wide Web: <http://www.avtechpulse.com>

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AVX-D-2-PS



- 30 to 150 ns delays
- 30 ns to 10  $\mu$ s delays
- 1  $\mu$ s to 100  $\mu$ s delays
- Jitter as low as  $\pm 10$  ps
- TTL signal levels
- Will drive 50 Ohm loads

The three models in the AVX-D analog delay generator series feature low-jitter variable delays in the ranges of 30 ns to 150 ns (Model AVX-D-PS), 30 ns to 10  $\mu$ s (Model AVX-D-2-PS), and 1  $\mu$ s to 100  $\mu$ s (Model AVX-D-3-PS). Model AVX-D-PS offers a very low jitter of  $\pm 10$  ps. Model AVX-D-2-PS exhibits a jitter of  $\pm 30$  ps at the minimum delay setting, increasing to  $\pm 300$  ps at the maximum delay setting. The jitter for the longer-delay Model AVX-D-3-PS is specified as  $\pm 300$  ps. All signals are TTL compatible and the output pulses will drive loads as low as 50 Ohms. The IN trigger pulse in all models is split into an output TRIG pulse (equal to the width of the IN pulse and delayed by about 20 ns) and an OUT pulse having a fixed width of about 250 ns. The delay between the leading edges of the IN and OUT pulses in Model AVX-D-PS (30 to 150 ns) is controlled via a one-turn control, while the delay in Models AVX-D-2-PS and AVX-D-3-PS (30 ns to 10  $\mu$ s and 1  $\mu$ s to

100  $\mu$ s, respectively) is controlled by 10-turn dial reading pots and range switches. Model AVX-D-PS is also available with an optional electronic delay control (0 to +10 Volts).

The input and output waveforms for the various models are illustrated above along with an example of a possible application where the delay generator is used to compensate for the propagation delay through an optical fiber.

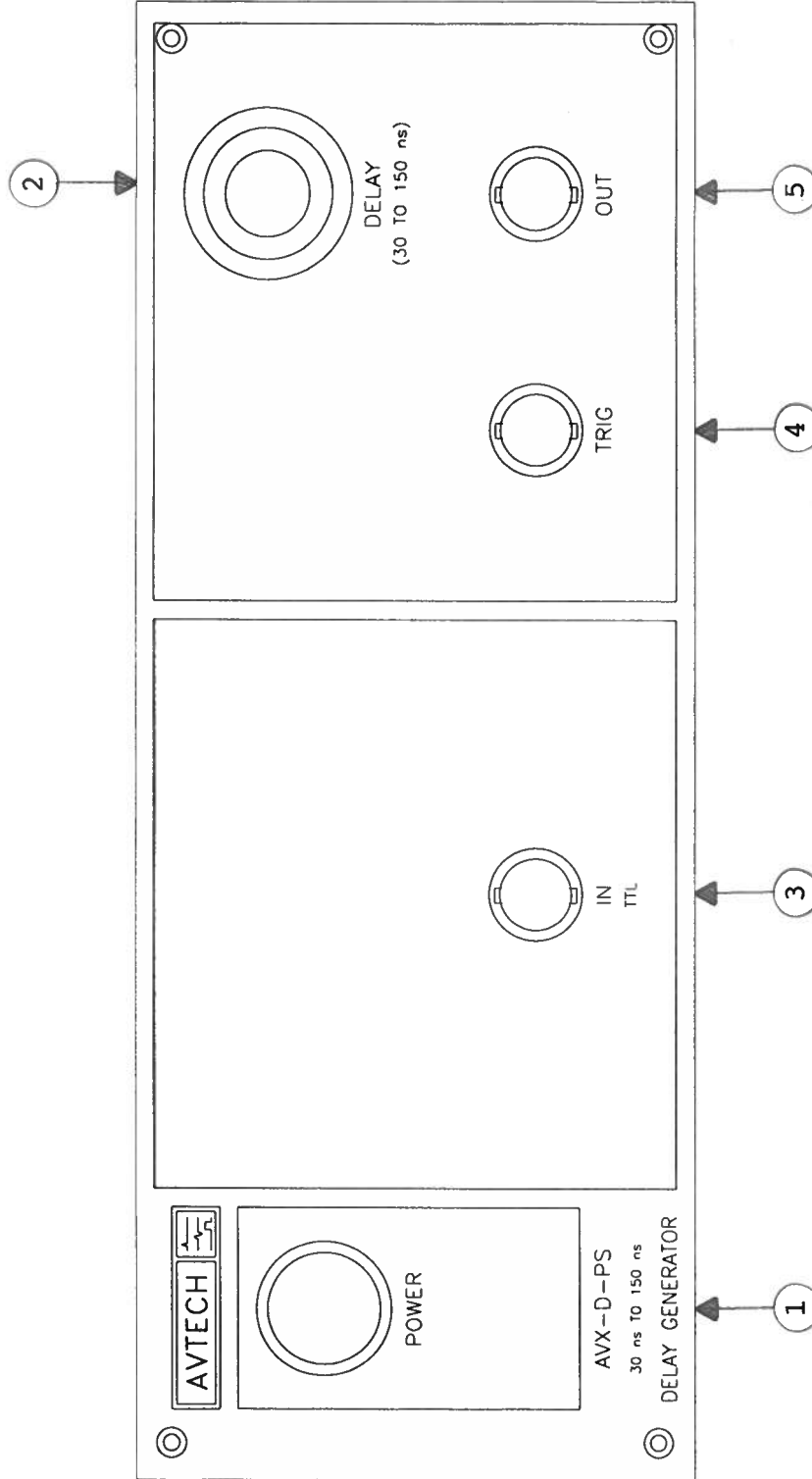
The units will operate at PRF as high as 1.0 MHz provided the delay setting does not exceed one-half of the period of the PRF. Units with the -PS suffix require 110/220V (switchable), 50-60 Hz prime power while units without the -PS suffix (i.e. modules) require +15 V DC prime power.

Model:	AVX-D-PS <sup>1</sup> AVX-D	AVX-D-2-PS <sup>1</sup> AVX-D-2	AVX-D-3-PS <sup>1</sup> AVX-D-3
Delay range <sup>2</sup> :	30 ns to 150 ns	30 ns to 10 $\mu$ s (3-position range switch)	1 $\mu$ s to 100 $\mu$ s (2-position range switch)
Jitter: (Ext trig in to pulse out)	$\pm 10$ ps	$\pm 30$ ps to $\pm 300$ ps max	$\pm 300$ ps
Output amplitude:	+ 5 V (TTL) will drive 50 Ohm loads		
Trigger required:	Modules and -PS units: +5 Volt, 50 to 500 ns (TTL)		
OUT pulse width:	250 ns		
Trig PW:	Equals input PW		
PRF:	0 to 1 MHz	0 to 1 MHz (50% max duty cycle)	0 to 50 kHz (50% max duty cycle)
Connectors:	-PS: Modules:	Out: BNC, Trig: SMA, In: SMA,	Trig: BNC, In: SMA, Power: Solder terminals
Power requirement:	-PS: Modules:	120/240 Volts (switchable) 50 - 60 Hz + 15 Volt, 200 mA	
Dimensions: (H x W x D)	-PS: Modules:	100 mm x 215 mm x 375 mm (3.9" x 8.5" x 14.8") 43 mm x 66 mm x 107 mm (1.7" x 2.6" x 4.2")	

1) -PS suffix indicates line powered instrument requiring external trigger. No suffix indicates miniature module requiring DC power and external trigger. (See page 112 for additional details of the basic instrument formats).

2) For electronic control (0 to + 10 V) of delay in Models AVX-D or AVX-D-PS suffix model No. with -ED.

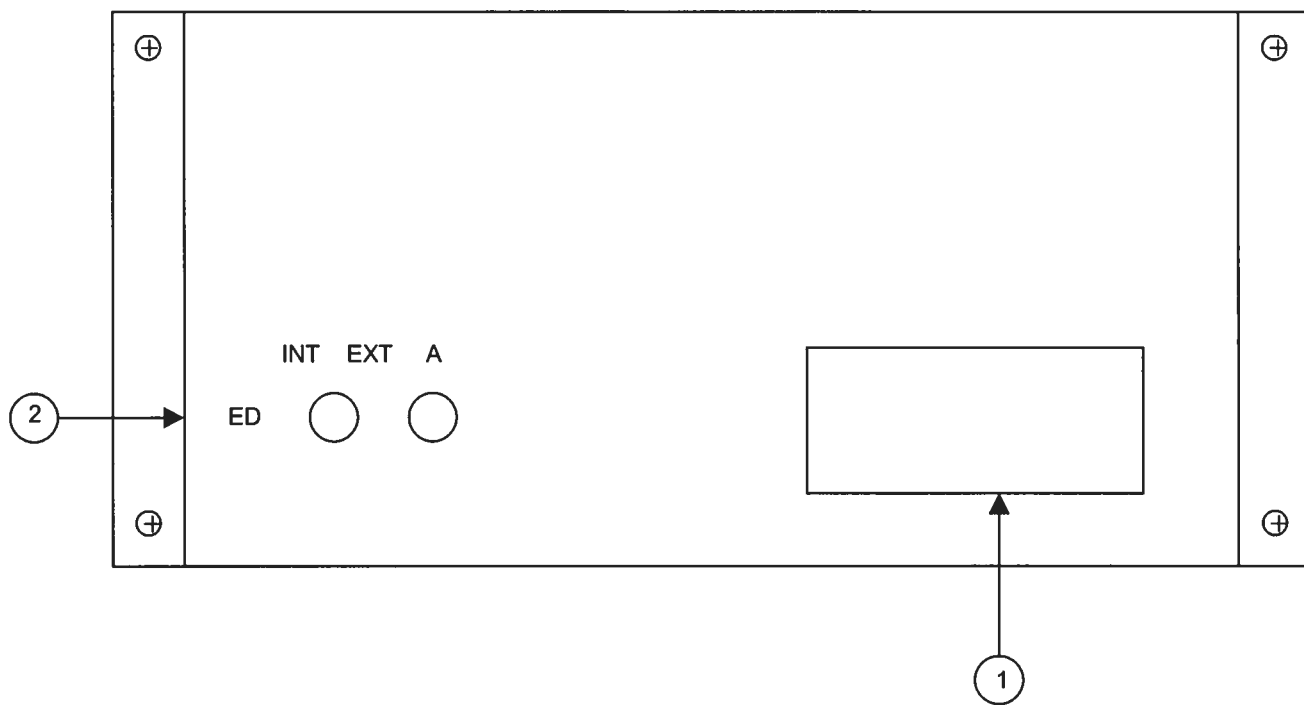
**FIG. 1: FRONT PANEL CONTROLS**



## FRONT PANEL CONTROLS

- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) DELAY Control. Controls the relative delay between the output pulse provided at OUT (5) and IN (3). This delay is variable over the range of 30 to about 150 ns. To voltage control the delay, set the switch in the EXT position and apply 0 to +10V to the "A" BNC connector ( $R_{IN} \geq 10K$ ). (option).
- (3) IN. Apply TTL input at this terminal (PW > 50 ns).
- (4) TRIG. Replica of IN pulse delayed by 30 ns appears here. Will drive 50 Ohms.
- (5) OUT. +5 Volt output to 50 Ohms. This output is delayed 30 to 150 ns with respect to the IN pulse.

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.

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.

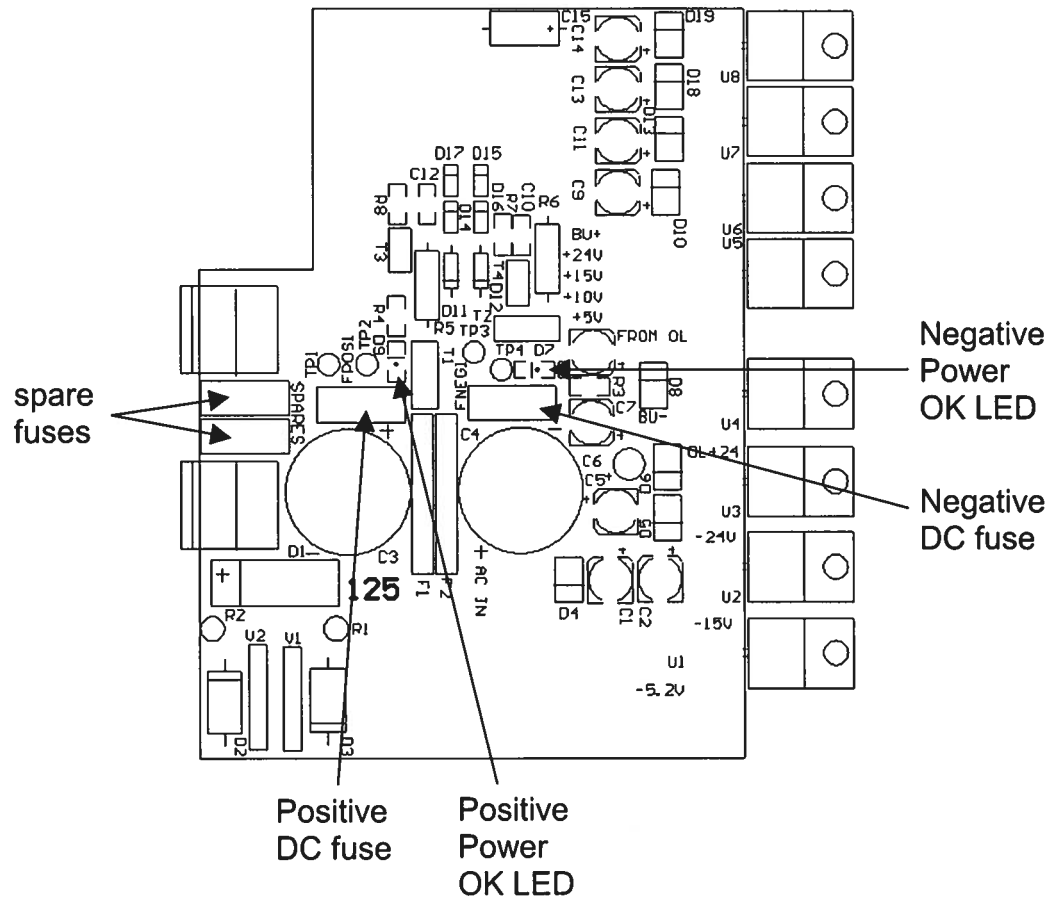
- (2) To voltage control the delay, set the switch in the EXT position and apply 0 to +10V to the "A" BNC connector ( $R_{IN} \geq 10K$ ). (option).



## POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three main fuses, plus two spares. 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 two spares) are located on the internal DC power supply, as shown below:



The four fuses on this circuit board are 0.5A slow-blow fuses, Littelfuse 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. (Two spare 0.5 Amp fuses are provided on the circuit board. They may be transferred to the active fuse locations using needle-nose pliers.)

July 17/2001