

INSTRUCTIONS

MODEL AV-155-PS-HW2-EA

0 to ± 4 AMP AMPLITUDE,
0 to ± 10 V COMPLIANCE, 100 ns RISE TIME

PULSED CONSTANT CURRENT GENERATOR

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 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

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

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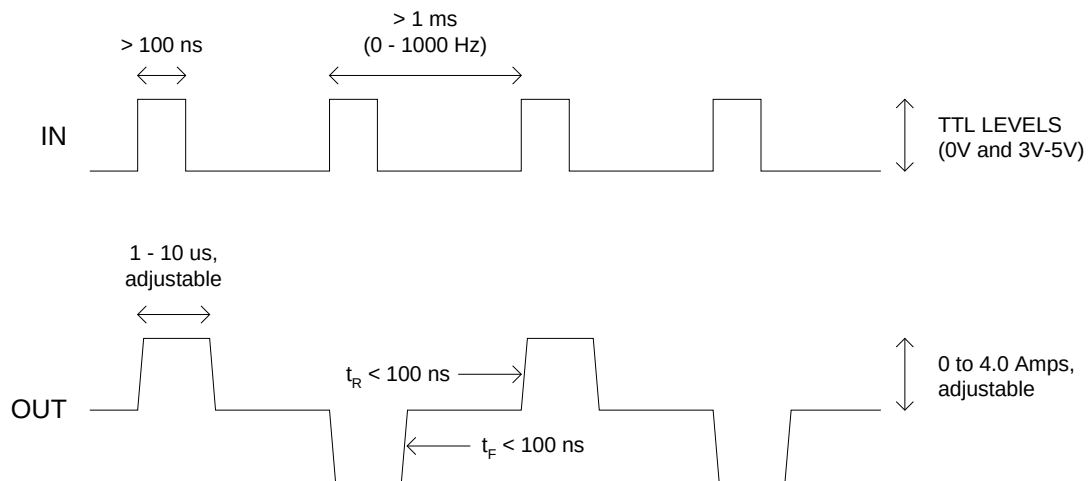
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INTRODUCTION

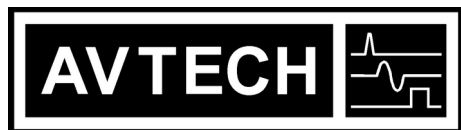
The Model AV-155-PS-HW2-EA pulsed constant current generator is capable of producing pulses with amplitudes as high as 4 Amps into load voltages up to 10V, with 100 ns rise and fall times.

The output pulses alternate in polarity, i.e., every second pulse is negative.

The AV-155-PS-HW2-EA must be triggered by an external TTL signal.



A 200 Ohm internal resistor is connected across the output connector, to limit the saturation voltage when operating into an open circuit. This reduces the possibility of load damage when connecting or disconnecting loads. (To minimize the saturation voltage, please see page 10.)

ORIGINAL QUOTATION / SPECIFICATIONS**AVTECH ELECTROSYSTEMS LTD.**

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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U.S.A. 13669-0265
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Quote No: <u>11241</u>	Sender's Fax: <u>613-226-2802</u>
File: <u>Q:\office\QUOTES\Q11241.doc</u>	Receiver's Fax: <u>763-954-2040</u>
To: <u>Honeywell</u>	Receiver's Phone: <u>763-954-2807</u>
	Date: <u>October 22, 2002</u>
Attn: <u>David Schuetzle</u>	Number of pages: <u>3, including cover</u>
Subject: <u>Price and delivery quotation</u>	

Following your telephone request of October 22, 2002, I am pleased to quote as follows:

Quote Number:	11241
Model designation:	AV-155-PS-HW2-EA
Output waveform:	See enclosed sketch
Output amplitude:	0 to ± 4.0 Amperes. (One ten turn control or by externally applied 0 to +10 VDC).
Compliance voltage:	± 10 Volts
Output pulse width:	1 us to 10 us (Ten turn control)
Output regulation:	Output current changes by less than 5% when load voltage changed from 10 to 0 Volts
Rise time, fall time:	≤ 100 ns
Pulse repetition frequency:	0 to 100 Hz PRF controlled by the input trigger PRF
Input trigger:	TTL, 50% duty cycle
Connectors:	BNC

Size: 3.9"x17"x14.8" (Avtech Style G1)
Other: See AV-155-PS series.
(pages 66 and 67, Cat. No. 11)
Price: \$5,698.00 US, FOB: Destination
Delivery: 60 days, after receipt of order.

Thank you for your interest in our products. Please call or email me if you require any further information.

Regards,

Mary Budarick
Sales Manager

MB:hn

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. Confirm that the power selector card is in the correct orientation.

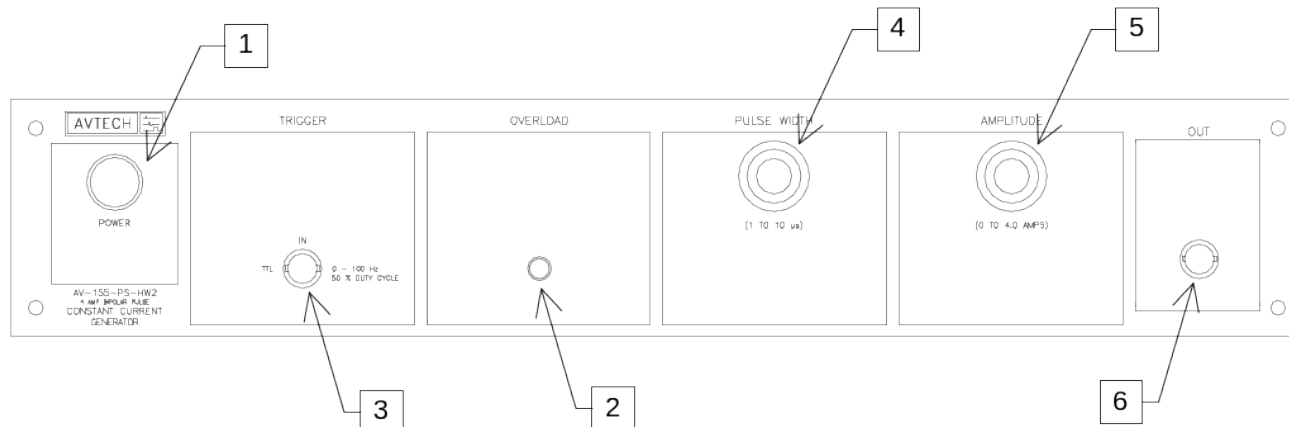
For AC line voltages of 110-120V, the power selector card should be installed so that the "120" marking is visible from the rear of the instrument, as shown below:

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, as shown below:

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.

FRONT PANEL CONTROLS



1. **POWER Switch.** The POWER push button switch applies AC prime power to the primaries of the transformer, turning the instrument on. The push button lamp (#382 type) is connected to the +15V DC supply.
2. **OVERLOAD.** This instrument is protected by an automatic overload circuit, which controls the front panel overload light. 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 turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation.

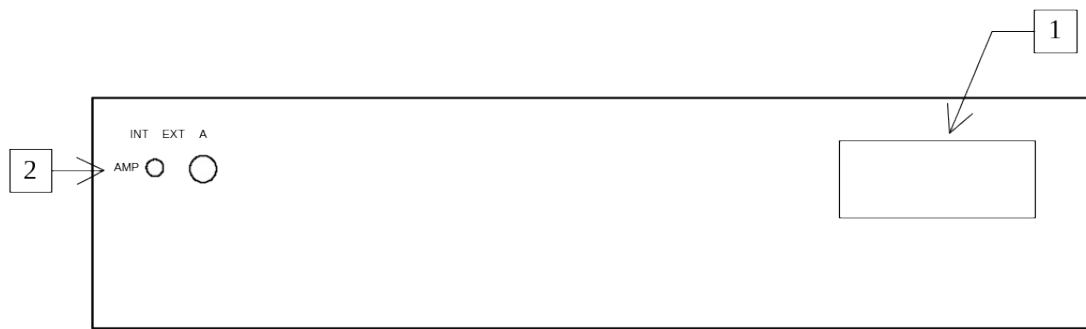
This overload indicator may come on briefly at start-up. This is not a cause for concern.

3. **IN Connector.** A TTL-level pulse applied to this input will trigger the instrument. The instrument triggers on the rising edge of this input. The input impedance of this input is 1 k Ω . (Depending on the length of cable attached to this input, and the source driving it, it may be desirable to add a coaxial 50 Ohm terminator to this input to provide a proper transmission line termination. The Pasternack (www.pasternack.com) PE6008-50 BNC feed-thru 50 Ohm terminator is suggested for this purpose.)

Although this input is nominally specified to be a 50% duty cycle signal with a maximum repetition rate of 100 Hz, the instrument can be safely operated at repetition rates as high as 1 kHz, and the input pulse width can be as low as 100 ns. There is no upper limit on the maximum pulse width.

4. PULSE WIDTH Control. This ten-turn locking dial varies the output pulse width from 1 to 10 us, approximately.
5. AMPLITUDE Control. This ten-turn locking dial varies the output amplitude from 0 to ± 4 Amps, approximately. This control is only active if the rear-panel INT/EXT switch is set to "INT".
6. OUT Connector. This is the output connector. To obtain best results, the cable length between this connector and the load device should be minimized, to reduce impedance-mismatch reflections and distortions on the output waveform.

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 card that can be removed and repositioned to switch between 120V AC in and 240V AC in.

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.

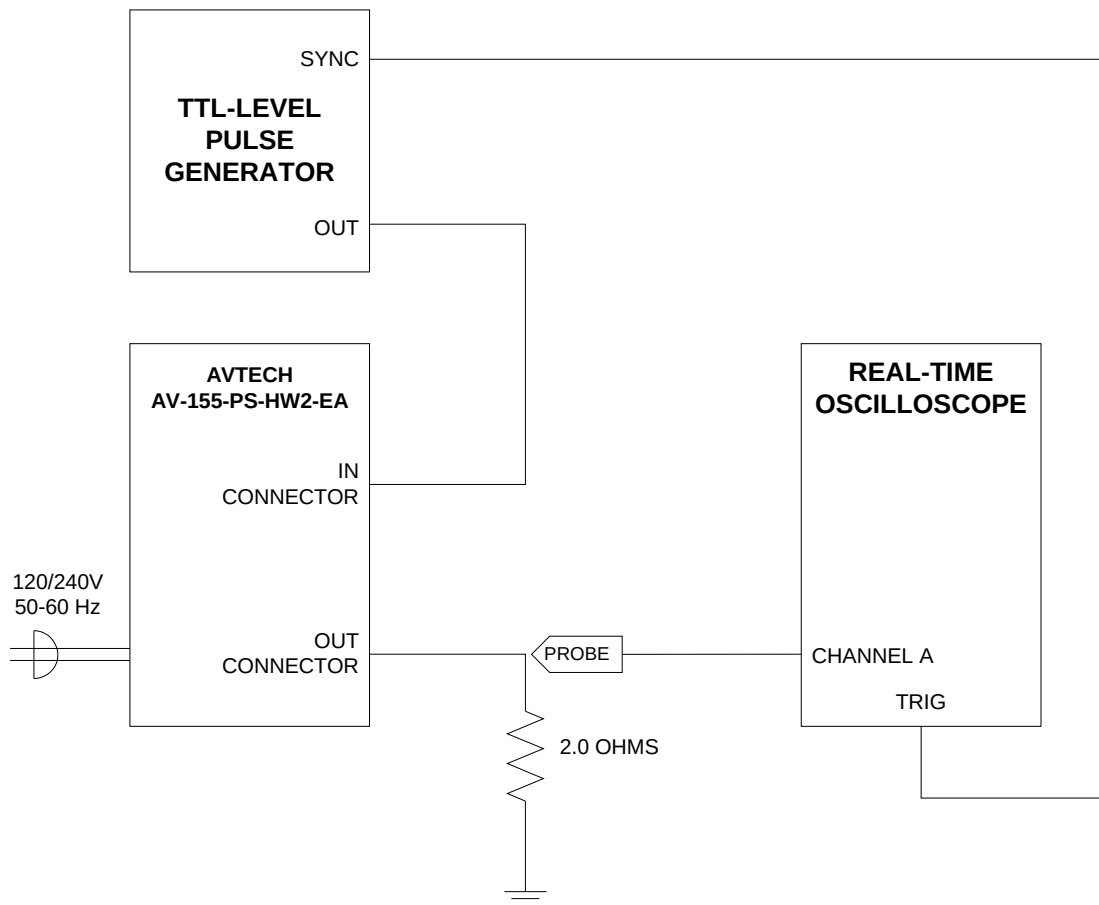
For AC line voltages of 220-240V, the power selector card should be installed so that the “240” marking is visible from the rear of the instrument.

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.

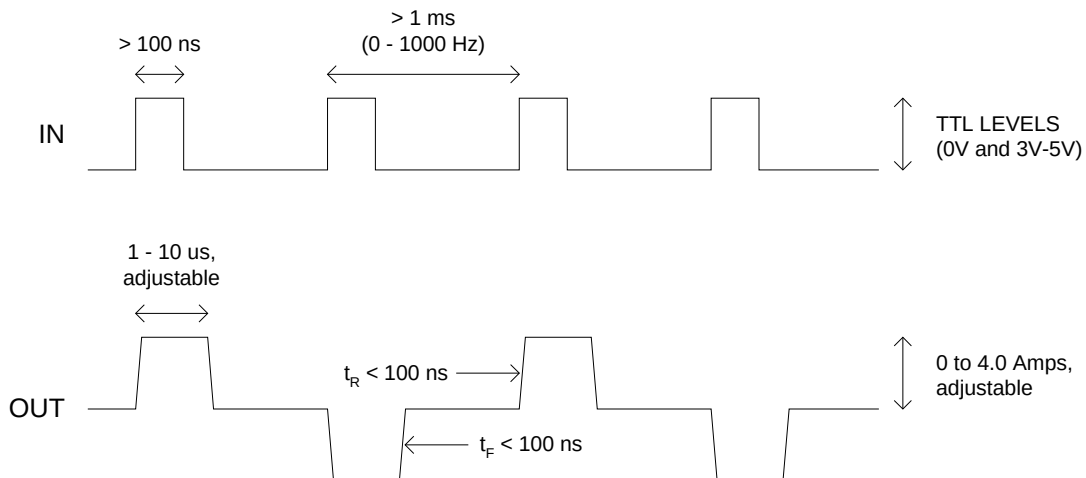
In the 120V setting, a 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow blow fuse is required. See the “Installation” section for more details.

2. AMP INT/EXT SWITCH AND CONNECTOR. To control the amplitude of the output with an external DC voltage, set the two-position switch to the EXT position and apply 0 to +10V to the BNC Connector ($R_{IN} \geq 10 \text{ k}\Omega$). When this switch is in the “INT” position, the amplitude is controlled by the front-panel controls

BASIC TEST ARRANGEMENT



The input and output waveforms for the unit are below. Note that the unit operates as a pulsed constant current source and for that reason the load resistance should be less than 2.5 Ohms (to avoid saturating the output stage) and the load inductance must be exceedingly low (to avoid inductive spikes on the transitions).



MECHANICAL INFORMATION

TOP COVER REMOVAL

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).

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.

ELECTROMAGNETIC INTERFERENCE

To prevent electromagnetic interference with other equipment, all used outputs should be connected to shielded 50 Ω loads using shielded 50 Ω coaxial cables. Unused outputs should be terminated with shielded 50 Ω BNC terminators or with shielded BNC dust caps, to prevent unintentional electromagnetic radiation. All cords and cables should be less than 3m in length.

INTERNAL ADJUSTMENTS

An internal trimpot is provided for nulling any DC offset observed on the output. Eliminating this offset will also reduce the saturation voltage present on the output connector when no load is connected. With proper adjustment, this saturation voltage should be less than 0.2 Volts.

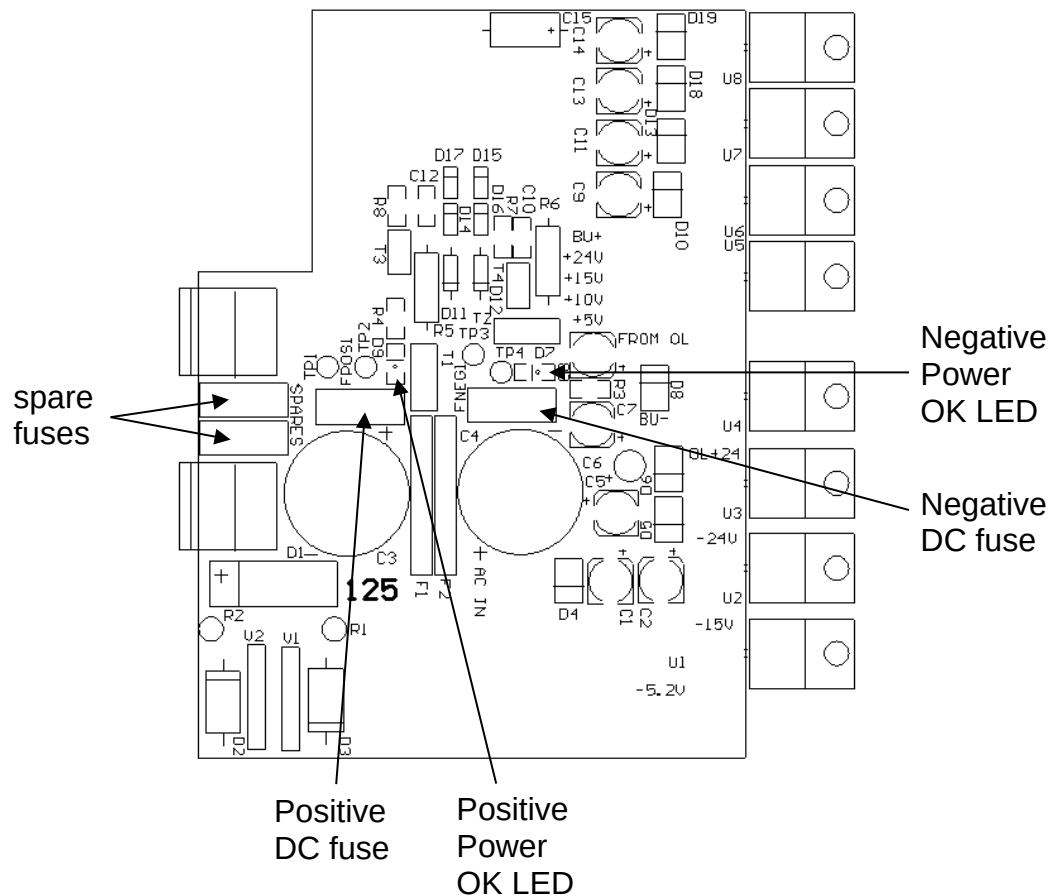
This trimpot may be accessed by removing the top cover. The trimpot is mounted on the right side panel, near the front.

To adjust this trimpot, disconnect any attached loads on the output connector, and attach a voltmeter to the output instead. Turn on the instrument, and rotate the trimpot screw until the voltage observed on the output is zero.

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 positive fuse and one of the spare fuses on this circuit board are 1A slow-blow fuses, Littlefuse part number R452001. (This fuse can be ordered from Digikey, www.digikey.com. The Digikey part number is F1343CT-ND). The negative fuse and the second spare fuse are 0.5A slow-blow fuses (Littlefuse R452.500, Digikey part number 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. (Spare 1 Amp and 0.5 Amp fuses are provided on the circuit board. They may be transferred to the active fuse locations using needle-nose pliers.)

PERFORMANCE CHECK SHEET