



The AV-156 series of pulsed constant current generators was designed for a wide variety of component testing applications, such as laser diode driving, airbag squib testing, initiator and fuse testing, and power semiconductor device characterization. All AV-156 models described here include IEEE-488.2 GPIB and RS-232 computer control interfaces, making them ideal for many automatic test and R&D applications.

Model AV-156K-B is a 0 to +2 Amp pulser, with 200 ns rise and fall times. The pulse width is variable from 1 us to 10 ms, with repetition rates to 10 kHz. The maximum duty cycle is 80% for amplitudes below 1A, and 40% for amplitudes to 2A. The usable load voltage range is 0 to +20 Volts.

Model AV-156A-B is a 0 to +5 Amp pulser, providing 4 us rise times, pulse widths from 10 us to 10 ms (100 ms optional), pulse repetition frequency (PRF) to 10 kHz and a load voltage range of 0 to +15 Volts. An option allowing a DC offset of up to +500 mA to be added to the output is available.

The model AV-156G-B is similar, but the maximum amplitude is increased to 10 Amps, and the maximum duty cycle is 10%.

The load voltage of both the AV-156A-B and AV-156G-B can be increased to +25V by adding the -HC option.

Some models also available with a voltage-to-current converter mode option. In this mode, an externally generated voltage waveform is applied to a rear-panel connector. The current waveform on the main output is then proportional to the voltage input waveform, that is, $I_{OUT} = k \times V_{IN}$. The value of k is such that the maximum value of V_{IN} is 10V.

The higher-current AV-156H-B offers amplitudes of 30 mA to 30 Amps, with a load voltage range of 0 to +30 Volts, and pulse widths variable from 0.3 to 30 ms. This model is intended primarily for "single-shot" use (i.e., low repetition rates).

LabView drivers are available for these single-output instruments at <http://www.avtechpulse.com/labview>. The instrument may be controlled by the GPIB and RS-232 ports, or by the front-panel keypad and adjust knob.

For more complex test applications, two dual-channel units are available. Model AV-156E-B is dual-channel 5 Amp, 25 Volt unit ideal for airbag squib testing. The output pulse widths are independently variable up to 100 ms. The amplitudes are also

- Peak outputs of 5, 10, or 30 Amps
- Load voltage ranges of 15, 25 or 30 Volts
- Pulse repetition frequencies to 10 kHz
- Pulse widths from 10 us to 100 ms
- DC offset option on some models
- Two dual-channel units, ideal for airbag squib testing
- IEEE-488.2 GPIB and RS-232 control
- Output current monitor and overload protection

independently variable. One of the two channels has a variable delay, of 0 to 1.0 seconds. The pulse repetition frequency is variable from 1 to 100 Hz and the unit includes pushbutton and external triggering capability. Both channels share a common trigger. The AV-156E-B offers 10 us rise and fall times.

Model AV-156F-B is a similar dual-channel pulser, but offers higher amplitudes of 0 to +10 Amps, with 4 us rise & fall times. The pulse repetition frequency is variable from 0.5 to 50 Hz.

All models include a rear-panel monitor output (for display on an oscilloscope) that provides an attenuated coincident voltage replica of the load current. All models are protected against high duty cycle overload conditions by an automatic control feature that limits the average output power for as long as the overload condition persists.

On initial power-up, the output is shorted to ground by a relay, until the output is enabled by the user. The shorting relay may be re-enabled as required.

All instruments with the -B suffix include a complete computer control interface. This provides GPIB and RS-232 computer-control (see <http://www.avtechpulse.com/gpib> for details), as well as front panel keypad and adjust knob control of the output pulse parameters. A large backlit LCD displays the output amplitude, frequency, pulse width, and delay. To allow easy integration into automated test systems, the programming command set is based on the SCPI standard. An Ethernet port for Telnet-based control is optional (-TNT option, see <http://www.avtechpulse.com/options/tnt>) on all units.

All models require 100-240 Volt, 50-60 Hz prime power.

See the AV-108 Series for high duty cycle pulsed constant currents to 200 Amps, the AV-106 Series for currents of 5, 30 and 100 Amps and the AV-107 Series for fast rise time current pulses to 20 Amps. These models are described in detail at <http://www.avtechpulse.com/current>. A parametric search engine is available online at <http://www.avtechpulse.com/pick> to assist you in selecting the best instrument for your application.

Many aspects of the AV-156 family can be adapted to meet your particular requirements. Call or email Avtech today (info@avtechpulse.com) with your requirement.



AV-156E-B



SPECIFICATIONS

AV-156 SERIES

Model:	AV-156K-B	AV-156A-B	AV-156G-B	AV-156H-B	AV-156E-B	AV-156F-B
Amplitude:	0.01 - 2.0 A	0.01 - 5.0 A	0.01 - 10 A	0.03 - 30 A	0.01 - 5.0 A	0.01 - 10.0 A
Number of output channels:	One				Two, with independent control of amplitude and pulse width.	
Pulse width (FWHM):	1 us to 10 ms	10 us to 10 ms Optional ⁹ : 10 us to 100 ms		0.3 to 30 ms	1 to 100 ms	
Max. pulse repetition freq:	10 kHz	10 kHz		1 Hz	100 Hz	50 Hz
Max. duty cycle:	80% for 0-1A, 40% for 1-2A.	20%	10%	1%	10%	5%
Rise & fall time ¹ (20%-80%):	< 200 ns	< 4 us		< 50 us	< 10 us	< 4 us
Load configuration:	Referenced to ground.					
Polarity:	Positive - sources current.					
Output current regulation:	< 2 % load voltage change from 0 Volts to maximum rated voltage					
Load voltage range:	0 to +20V	Standard: 0 to +15V With -HC option ² : 0 to +25V		0 to +30V	0 to +25V	
Voltage-to-current amplifier mode:	With -VI option ³ : I _{OUT} waveform tracks V _{IN} waveform. +10V full-scale. Average current 1A maximum.			N/A	N/A	
DC offset / bias option ⁸ :	N/A	0.01 - 0.5 A (optional feature ⁸)		N/A	N/A	
Overshoot ⁴ :	< 10 %					
Jitter:	< ± 200 ps ± 0.03% of sync delay (Ext trig in to pulse out)					
Trigger required:	External trigger mode: TTL, PW > 50 ns					
Sync delay: (Sync out to pulse out)	0 to ±1.0 seconds				Channel 1: 0 to 1.0 seconds Channel 2: 0 (fixed)	
Sync output:	+3 Volts, 100 ns, will drive 50 Ohm loads					
Amplitude accuracy ^{1,5} :	± 3 mA ± 3%					
Frequency accuracy ⁵ :	± 3%					
Pulse width accuracy ^{1,5} :	± 50 ns ± 3%	± 1 us ± 3%				
Sync delay accuracy ^{1,5} :	± 50 ns ± 3%	± 1 us ± 3%				
Gate input:	Active high or low, switchable. Suppresses triggering when active.					
Monitor output:	N/A	Back-panel BNC connector provides a coincident replica of the output current.				
Connectors, main output:	DB-37, rear-panel ¹⁰	BNC, front-panel ⁶	Banana jacks, rear-panel	BNC, front-panel ⁶		
Connectors, other:	Sync output: BNC, front-panel. Gate, Ext Trig, Monitor: BNC, rear-panel					
GPIB and RS-232 control:	Standard feature. See page See http://www.avtechpulse.com/gpib for details.					
LabView Drivers:	Check http://www.avtechpulse.com/labview for availability and downloads					
Telnet / Ethernet control ⁷ :	Optional. See http://www.avtechpulse.com/options/tnt for details.					
Power requirements:	100 - 240 Volts, 50 - 60 Hz					
Dimensions: (H x W x D)	100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8")				100 mm x 430 mm x 425 mm (3.9" x 17" x 16.8")	
Chassis material:	cast aluminum frame & handles, blue vinyl on aluminum cover plates					
Temperature range:	+5°C to +40°C					

- 1) Valid when driving a load impedance that is between zero Ohms and the impedance given by (Maximum Compliance Voltage) / (Maximum Rated Current). For load impedances higher than this value, de-rate the rise and fall times proportionally.
- 2) To specify the high compliance voltage option, add the suffix -HC to the model number.
- 3) To specify the voltage-to-current amplifier mode option, add the suffix -VI to the model number.
- 4) Valid for amplitudes greater than 5% of the full-scale value, into non-inductive loads.
- 5) At room temperature, when operating into a resistive load.
- 6) To add a duplicate main output connector on the rear panel, add the suffix -RP to the model number.

- 7) Add the suffix -TNT to the model number to specify the Telnet / Ethernet control option.
- 8) Add the suffix -OT to the model number to specify the DC offset option. The total sum of the offset plus the amplitude can not exceed the maximum amplitude rating. That is, the amplitude and offset can not both be set to their maximum settings at the same time.
- 9) Add the suffix -PW to the model number to specify the wider pulse width range.
- 10) Pins 1-19 = signal, pins 20-37 = ground. Includes one AV-CLZ11-60 cable and one AV-CTL11 test load. See <http://www.avtechpulse.com/transmission/av-clz11/> for details.

Visit <http://www.avtechpulse.com/appnote> for these helpful application notes:

Choosing & Using Pulsed Constant-Current Sources, and Blue Diode Considerations
 How to Connect Loads to your Pulsed Constant Current Generator for Optimum Performance
 How to Deliver a Fast 2 Amp Pulse to a Diode in a Probing Station