



Top: AV-106A-B, -30A into 0.94Ω. 10 V/div, 400 ns/div.
 Bottom: Narrow Monitor into 50Ω. 1 V/div, 400 ns/div.

- Pulse current laser diode drivers
- Peak outputs of 5 to 100 Amps
- Pulse widths from 1 us to 1 ms
- Rise times from 50 ns to 1 us
- Rugged 100 cm output cables
- IEEE-488.2 GPIB and RS-232 interfaces

The AV-106 series of pulse generators is designed for pulsing laser diodes and other low impedance loads with current pulses as high 100 Amps, with wide pulse widths.

The AV-106A family provides up to 30 A with pulse widths variable from 0.5 to 50 us and 50 ns rise and fall times. These units will operate with a load voltage in the range of 0 to 30 V, and exhibit less than a 5% change in current for a load voltage change of 30 Volts.

For higher currents, the AV-106B family provides up to 100A in the pulse width range of 2 to 200 us.

For wider pulse width applications, the AV-106C family provides pulse widths to 1 ms and peak currents to 15 A.

The AV-106D family provides pulse widths to 1 ms, peak currents to 5 A and duty cycles to 50%.

All AV-106 models have a rear-panel output connector to which a unique 100 cm long high-current transmission line may be attached (model AV-CLZ1-100). This line has a characteristic impedance (Z_0) approximately equal to 1Ω. (see <http://www.avtechpulse.com/transmission/av-clz1> for details.) This allows the load to be placed away from the instrument without degrading the pulse shape. A medium-power test load (5 Watts) is provided with these models for the convenience of initial testing purposes.

The AV-106 models are pulsed constant current sources. The output current is largely independent of the load voltage. The instrument will function properly into short circuits and diode loads. For optimal waveform shape, however, it may be beneficial to add a small resistance to the load (~ 1Ω), to better match the load impedance to the cable characteristic impedance.

Either output polarity (+ or -) can be provided. All models are available with a dual polarity option. On dual polarity units, two output connector are present (one +, one -), but only one is active at a time.

A delay control and a sync output are provided for scope triggering purposes. The units can also be triggered externally using a TTL-level pulse. When triggered externally, the pulse width may be controlled by the front-panel controls, or the output pulse width can be set to track the input trigger pulse width. A push-button is provided for one-shot operation.

All models are available with optional remote analog

electronic control (0 to +10V) of the output amplitude. Electronic control units also include the standard front-panel one-turn controls.

All models are protected against excessively high duty cycles by an automatic control feature that limits the output power for as long as the overload condition persists. All models incorporate an Output On/Off function and soft-power-on circuitry to protect the load.

A monitor output provides an attenuated coincident replica of the main output current pulse.

A DC offset option is available. Units with this option include a “diode-OR gate” function to combine the pulse and the user-supplied DC bias (two high-current diodes are connected to allow the larger of the pulse or the DC offset to pass to the output). The DC bias polarity must be the same as the pulse polarity. The required DC bias (generated by a user-supplied power supply) is applied directly to rear-panel solder terminals.

All models include a complete computer control interface (see <http://www.avtechpulse.com/gpib> for details). This provides GPIB and RS-232 computer-control, as well as front panel keypad and adjust knob control of the output pulse parameters. A large backlit LCD displays the output amplitude, polarity, frequency, pulse width, and delay. To allow easy integration into automated test systems, the programming command set is based on the SCPI standard, and LabView drivers are available at <http://www.avtechpulse.com/labview>.

The -VXI option adds a rear-panel Ethernet connector, allowing an instrument to be remotely controlled using the VXI-11.3, ssh, telnet, and web protocols. In particular, the VXI-11.3 features allows software like LabView to control an instrument using standard VISA communications drivers and network cabling, instead of using older-style GPIB cabling and GPIB controller cards. For details, see <http://www.avtechpulse.com/options/vxi>.

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

See the continuously-updated applications note area of the Avtech web site for general applications assistance (<http://www.avtechpulse.com/appnote>). For the higher applications, see the AV-108 and for lower currents see the AV-107 series (<http://www.avtechpulse.com/current>).

Model ¹ :	AV-106A-B	AV-106B-B	AV-106C-B	AV-106D-B
Amplitude ² :	1 to 30 Amperes	3 to 100 Amperes	0.5 to 15 Amperes	0.2 to 5 Amperes
Load voltage range:	0 to 30 Volts	0 to 100 Volts	0 to 20 Volts	0 to 5 Volts
Pulse width (FWHM):	0.5 to 50 us	2 to 200 us	1 us to 1 ms	1 us to 1 ms
Rise & fall times (20%-80%):	≤ 50 ns	≤ 1.0 us	≤ 50 ns	≤ 0.5 us
PRF:	0 to 1 kHz	0 to 100 Hz	0 to 1 kHz	0 to 1 kHz
Duty cycle: (max)	0.25%	0.1%	1%	50%
Output impedance:	≥ 50 Ohms			
Output regulation:	≤ ±5% change in current for a load voltage change from 0 V to max. rated load voltage			
Polarity ³ :	Positive or negative or both (specify)			
DC offset option ⁶ :	5A	5A	5A	N/A
GPIB & RS-232 control ¹ :	Standard on -B units.			
LabView drivers:	Check http://www.avtechpulse.com/labview for availability and downloads			
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web:	Optional ⁴ . Recommended as a modern alternative to GPIB / RS-232. See http://www.avtechpulse.com/options/vxi for details.			
Settings resolution:	The resolution of the timing parameters (pulse width, delay, period) varies, but is always better than 0.15% of (set value + 20 ns). The amplitude resolution is < 0.1% of the maximum amplitude.			
Settings accuracy:	Typically ± 3% of setting (plus ± 1% of maximum, for amplitude) after a 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.			
Propagation delay (Jitter):	≤ 100 ns, (± 100 ps ± 0.03% of sync delay, Ext trig in to pulse out)			
Trigger modes:	Internal trigger, external trigger (TTL level pulse, > 10 ns, 1 kΩ input impedance), front-panel "Single Pulse" pushbutton, or single pulse trigger via computer command			
Variable delay:	Sync to main out: 0 to 1.0 seconds, for all trigger modes (including external trigger).			
Sync output:	+3 Volts, > 50 ns, will drive 50 Ohm loads			
Gate input:	Sync or async, active high or low, switchable. Suppresses triggering when active.			
Monitor output:	Provides an attenuated coincident replica of output current pulse.			
Supplied output transmission line:	Detachable high-current transmission line cable assembly. See http://www.avtechpulse.com/transmission for details.			
Part number, length, Zo:	AV-CLZ1-100 (see http://www.avtechpulse.com/transmission/av-clz1). 1 Ω. 100 cm			
Output connection:	End of cable: DB-37 male. Pins 1-19 = signal, pins 20-37 = ground.			
Supplied test load ⁵ :	AV-CTL1-ENC. See http://www.avtechpulse.com/accessories/av-ctl1 for details.			
Connectors (other):	Trig, Sync, Gate, Monitor: BNC			
Power requirements:	100 - 240 Volts, 50 - 60 Hz			
Dimensions:	100 x 430 x 375 mm (3.9" x 17" x 14.8")			
Temperature range:	+5°C to +40°C			

- 1) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude, pulse width, PRF and delay (see <http://www.avtechpulse.com/gpib> for details).
- 2) The minimum useful amplitude is 3% of the maximum amplitude.
- 3) Indicate desired polarity by suffixing the model number with -P or -N (i.e. positive or negative) or -PN for dual polarity option.
- 4) Add the suffix -VXI to the model number to specify the Ethernet port.
- 5) The supplied test load is for low-duty-cycle basic operational tests only. The power rating of the load is 5 Watts. It may not be capable of supporting the instrument's full

- maximum average output power. See <http://www.avtechpulse.com/accessories/> for details about the AV-CTL series of test loads.
- 6) Add the -OS suffix to the model number to specify the DC offset option. The DC offset must be generated by a user-supplied power supply. The offset is combined with the pulse output using a diode-OR gate, which permits the larger of the two signals (pulse versus offset) to flow to the main output. Contact Avtech if you require higher DC current ratings or other offset configurations.



AV-106A-B, shown with the supplied accessories (AV-CLZ1-100 cable and AV-CTL1-ENC test load).
See <http://www.avtechpulse.com/transmission/av-clz1> for more information about the AV-CLZ1-100 cable.
See <http://www.avtechpulse.com/accessories/av-ctl1> for more information about the AV-CTL1-ENC test load.