

AVL-AV-1-B

- Amplitudes to 450 Volts
- Rise times in the range of 1 - 5 ns
- PRF to 2 or 5 kHz

The AVL series provides high amplitude (to 450V) pulse outputs with rise times as low as 1 ns and fall times of 2 ns, pulse repetition frequencies as high as 50 kHz, and maximum pulse widths variable from 3 to 400 ns.

The AVL-AV-1-B provides peak amplitudes of 100 Volts with pulse widths variable from 3 to 100 ns (and to 400 ns with a wide pulse option). The rise time is 1 ns, the fall time is 2 ns, and the maximum pulse repetition frequency (PRF) is 50 kHz. The AVL-AV-1-W-B offers operation at wider pulse widths (5-400 ns), with 2 ns rise times.

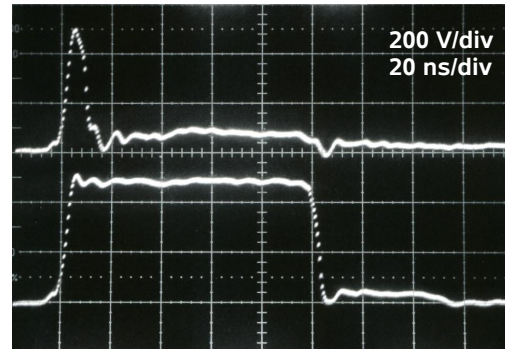
The AVL-2A-B provides peak amplitudes of 160 Volts with pulse widths variable from 3 to 100 ns. Rise times are 2 ns, with PRFs to 20 kHz. The AVL-2A-W-B offers wider pulses (3-400 ns).

The AVL-2D-B operates to 240V, with pulse widths of 10 to 100 ns, rise times of 1.5 ns, and fall times of 2 ns. The maximum PRF is 20 kHz.

The AVL-5 family provides output amplitudes variable from up to 450 Volts, with pulse widths variable from 8 to 100 ns, with 5 ns rise and fall times, and repetition rates to 2 kHz. (The AVL-5 has a small “back-porch” transient which is < 15% of the set amplitude, and may last as long as 150 ns after the rising edge. It is most noticeable at narrow pulse width settings. See the waveform photo above for an example.) The rise time can be reduced to 2.5 ns with the -TR option, with a slightly reduction in the maximum amplitude to 400V.

Either output polarity or optional dual output polarity can be provided. The output polarity of dual-polarity units can be switched from the front panel or by computer command.

All instruments with the -B suffix include a complete computer control interface. This provides GPIB and RS-232 computer-control, as well as front panel keypad and adjust knob control of the output pulse parameters. (See <http://www.avtechpulse.com/gpib> for details.) A large backlit LCD displays the output amplitude, polarity, frequency, pulse width, and delay. To allow easy



AVL-5-B (Min and max pulse width)

- Pulse widths to 100 or 400 ns
- IEEE-488.2 GPIB and RS-232 control
- Ethernet port for VXI-11.3 support

integration into automated test systems, the programming command set is based on the SCPI standard, and LabView drivers are available online at <http://www.avtechpulse.com/labview>.

A standard rear-panel Ethernet connector allows the 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. Please see <http://www.avtechpulse.com/options/vxi> for details.

All models may be triggered externally using a TTL-level pulse. The propagation delay in the externally triggered mode is typically 350 ns. All models include a delay control and sync output for oscilloscope triggering purposes.

A DC offset or bias insertion option is available. Units with this option include a circuit similar to the AVX-TB (see <http://www.avtechpulse.com/bias>) bias tee at the output. The required DC offset is applied directly to rear panel solder terminals. AVL units are also available with a monitor output option that provides an attenuated (20 dB or ± 10) coincident replica of the main output pulse. All models are also available with analog electronic control (0 to +10V) of output amplitude.

The AVL series may be combined with the AVX transformer series to obtain higher peak currents into low impedance loads, or higher peak voltages into high impedance loads.

The AVL models are optimized for fast rise times, and not necessarily for pulse top flatness. See the waveforms above for typical results. Customers who require extremely flat topped pulses (e.g., for particle beam gating) should consult with Avtech (info@avtechpulse.com) before selecting an appropriate model.

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



SPECIFICATIONS

AVL SERIES

Model ¹ :	AVL-AV-1-W-B	AVL-AV-1-B	AVL-2A-W-B	AVL-2A-B	AVL-2D-B	AVL-5-B	AVL-5-B-TR
Maximum amplitude ² : (50Ω load required ⁷)	100 V	100 V	160 V	160 V	240 V	450 V	400 V
Rise time (20%-80%):	≤ 2 ns	≤ 1 ns	≤ 2 ns	≤ 2 ns	≤ 1.5 ns	≤ 5 ns	≤ 2.5 ns
Fall time (80%-20%):	≤ 3 ns	≤ 2 ns	≤ 3 ns	≤ 3 ns	≤ 2 ns	≤ 5 ns	
Pulse width (FWHM):	5 - 400 ns	3 - 100 ns	3 - 400 ns	3 - 100 ns	10 - 100 ns	8 - 100 ns	
PRF:	0 to 50 kHz		0 to 20 kHz			0 to 2 kHz	
Polarity ³ :	Positive or negative or both (specify)						
Jitter:	± 100 ps ± 0.03% of sync delay (Ext trig in to pulse out)						
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:	Included. 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 ± 4% (± 2 ns or ± 4% of max. amplitude) after 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.						
DC offset or bias insertion ⁴ :	Option available. Apply required DC offset or bias in the range of ± 50 Volts (250 mA max) to back panel solder terminal.						
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 ⁵ :	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						
Propagation delay:	≤ 350 ns (Ext trig in to pulse out)						
Gate input:	Synchronous. Active high or low, switchable. Suppresses triggering when active.						
Monitor output option ⁶ :	Provides a 20 dB attenuated coincident replica of the main output						
Connectors:	BNC						
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")						
Chassis material:	Cast aluminum frame & handles, blue vinyl on aluminum cover plates						
Mounting:	Any						
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>).
- 2) For operation at amplitudes of less than 20% of full-scale, best results will be obtained by setting the amplitude near full-scale and using external attenuators on the output.
- 3) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative) or -PN for dual polarity option. Polarity reversal is achieved via keypad or computer control.

- 4) For DC offset option suffix model number with -OS.
- 5) Delay must be less than the period (1 / PRF).
- 6) For monitor option add suffix -M. The monitor, when used, will load down the main output slightly, causing a 10% drop in the maximum main output amplitude.
- 7) A 50 Ohm load is required. Other loads may damage the instrument. Consult Avtech (info@avtechpulse.com) if you need to drive other load impedances.

