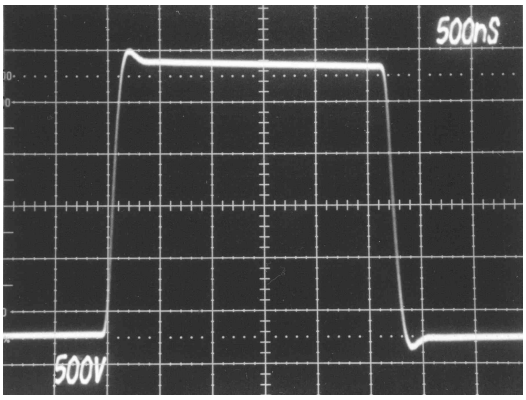
AVRH SERIES

2 & 3 KILOVOLT PULSE GENERATORS WITH 50 AND 100 ns RISE TIMES, 200 ns TO 5 us PULSE WIDTHS



- Amplitudes to 1000, 2000 or 3000 Volts
- 50, 80 and 100 ns rise and fall times
- Pulse widths variable from 0.2 to 2.5 us
- PRF to 1 kHz
- IEEE-488.2 GPIB and RS-232 ports
- Optional ethernet port for VXI-11.3 support

The AVRH series of pulse generators consists of three basic models providing output amplitudes in the range of 1000 to 3000 Volts into high impedance loads.

Model AVRH-3-B provides up to 3000 Volts out (to R ≥ 10 kΩ) with rise and fall times of 100 ns and pulse widths variable from 200 ns to 2.5 us. The pulse repetition frequency (PRF) is variable from 0 to 1.0 kHz, with a 0.25% duty cycle limit.

Model AVRH-2-B is similar but provides a maximum output of 2000 Volts (to R ≥ 10 kΩ) with a rise time of 80 ns. The pulse width is variable from 200 ns to 2.5 us, and the pulse repetition frequency is variable from 1 Hz to 1 kHz.

Model AVRH-1-B provide output amplitudes of up to 1000 Volts (to R ≥ 1 kΩ) at pulse widths variable from 200 ns to 5.0 us. The unit features a rise time of 50 ns and a PRF variable to 1.0 kHz with a 0.5% duty cycle limit.

The MOSFET output stage for all models will safely withstand any combination of front-panel control settings, output open or short circuits, and high-duty cycles. An internal power supply monitor removes the power to the output stage for five seconds if an average power overload exists. After that time, the unit operates normally for one second, and if the overload condition persists, the power is cut again. This cycle repeats until the overload is removed. Models AVRH-2-B and AVRH-3-B will source 0.25 and 0.35 Amps, respectively, and will shut down if the load current exceeds these values.

Aside from the internal clock, the units can also be triggered by a single-pulse pushbutton or an external TTL-level trigger input. When triggered externally the output pulse width can be set to track the input trigger pulse width ($PW_{OUT} = PW_{IN}$). A delay control and a sync output are provided for scope triggering. A gate input is also provided. Either (or both) output polarity can be provided.

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.

Free LabView drivers for these instruments are available for download 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. See http://www.avtechpulse.com/options/vxi.

The output connector on standard units is an SHV jack. MHV or HN output connectors are optionally available. An adapter kit, consisting of an SHV plug to MHV female adapter and an MHV male to BNC female adapter, is also available.

All AVRH units operate from 100 - 240 Volts, 50 - 60 Hz AC power, and are enclosed in a rugged all-metal 2U-height rack-mountable chassis.

Models in the AVRH series may be suitable for replacing obsolete models from the former Velonex Corporation in many applications.

For ≤ 1 kV applications, consider the related AVR-8A-B series. The AVR-8A-B will drive 50Ω (and higher) loads with amplitudes up to 1 kV, rise times less than 50 ns, and a wide pulse width range of 200 ns to 200 us. See http://www.avtechpulse.com/medium/avr-8a for details.

Alternatively, the Avtech AVRZ-5 pulse generator family (http://www.avtechpulse.com/medium/avrz-5w) provides 500V pulses into 50Ω loads, with rise and fall times below 10 ns.

Contact Avtech (info@avtechpulse.com) if you need help selecting an appropriate model for your application!

Actual test waveforms from shipped units are available from the online data pages for each model, at:

- http://www.avtechpulse.com/medium/avrh-1/#testresults
- http://www.avtechpulse.com/medium/avrh-2/#testresults
- http://www.avtechpulse.com/medium/avrh-3/#testresults

SPECIFICATIONS

AVRH SERIES

Model[1]:	AVRH-1-B	AVRH-2-B	AVRH-3-B
Amplitude[2]:	0 to 1000 Volts (to R ≥ 1 kΩ)	0 to 2000 Volts (to R ≥ 10 kΩ)	0 to 3000 Volts (to R ≥ 10 kΩ)
Rise / fall times (20%-80%):	≤ 50 ns	≤ 80 ns	≤ 100 ns
Pulse width (FWHM):	200 ns to 5 us	200 ns to 2.5 us	
Duty cycle (maximum):	0.5 %	0.25 %	
PRF:	Internal trigger: 1 Hz to 1 kHz. External trigger: 0 Hz to 1 kHz.		
Polarity[3]:	Positive or negative or both (specify)		
GPIB and RS-232 control[1]:	Yes (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 varies, but is always better than 0.15% of the set value. The amplitude resolution is typically 0.02% of the maximum amplitude.		
Settings accuracy:	Typically ± 3% (plus ±1V or ± 2 ns) after 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.		
Propagation delay:	≤ 200 ns (Ext trig in to pulse out)		
Jitter:	± 100 ps ± 0.03% of sync delay (Ext trig in to pulse out)		
Trigger required: (External trigger mode)	Mode A: + 5 Volts, 50 ns or wider (TTL) Mode B: + 5 Volts, PW_{IN} = PW_{OUT} (TTL)		
Sync delay:	Variable 0 to ± 1.0 seconds (sync out to pulse out)		
Sync output:	+ 3 Volts, 100 ns, will drive 50 Ohm loads		
Gated operation:	Synchronous or asynchronous, active high or low, switchable. Suppresses triggering when active.		
Connectors:	Out: SHV[5,6] Trig, Sync, Gate: 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 and handles, blue vinyl on aluminum cover plates		
Mounting:	Any		
Temperature range:	+5°C to + 40°C		

1) Provides IEEE-488.2 GPIB and RS-232 control of amplitude, pulse width, polarity, PRF and delay. (See http://www.avtechpulse.com/gpib for details).
2) For electronic control (0 to + 10V) of amplitude, add the suffix “-EA” to the model number. These units also include the standard front-panel controls.
3) Indicate desired polarity by suffixing 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) MHV or HN output connectors can also be provided. To specify, suffix the model number with -MHV or -HN as required.
6) An adapter kit, consisting of an SHV PLUG to MHV FEMALE adapter and an MHV MALE to BNC FEMALE adapter, is available. Add the suffix -ADPT1 to the model number to order this kit.

AVRH-3-B

Use the “Pick the Perfect Pulser” parametric search engine at http://www.avtechpulse.com/pick to find the best pulser for your application!