BAK ELECTRONICS, INC. Biomedical Instrumentation
41301 Silver Drive, Umatilla, FL 32784 / Office: 407-324-2907 / e-mail: bakinc@rcn.com

Biphasic Pulse Generators

Model BPG-1P

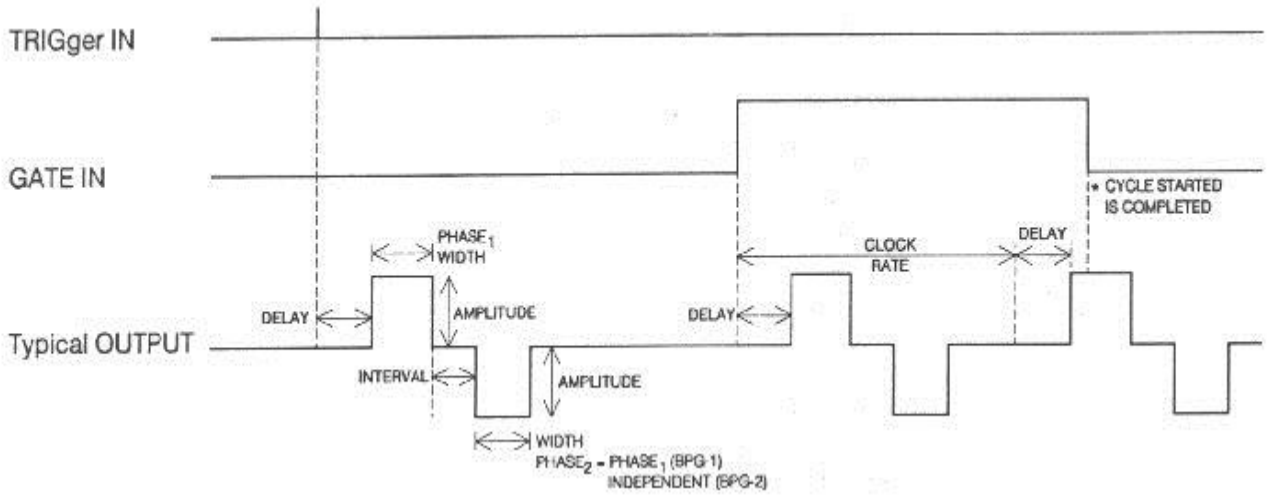
- AUTOMATICALLY TIMED AND BALANCED BIPHASIC PULSES
- INTERNAL TRAIN FREQUENCY GENERATOR, EXTERNALLY GATED OR EXTERNALLY TRIGGERED
- PRECISION 0- +/-10 V OUTPUT LEVELS
- ADJUSTABLE POST-TRIGGER DELAY
- ADJUSTABLE INTER-PHASE DELAY

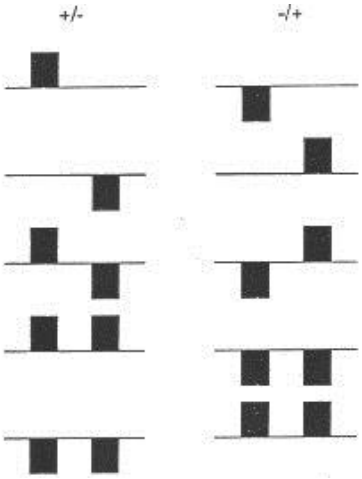
For a complete stimulus control and delivery system, use BAK BPG-1P Pulse Generators and follow with BSI-1A Biphasic Stimulus Isolator or BSI-2A Biphasic Stimulus Isolator for flexible, safe, precise constant current or voltage delivery.

Applications:

The importance of using balanced cathodic/anodic biphasic waveforms was discussed by Dr. J.C. Lilly and colleagues* in 1955 and has since been accepted as the best way to avoid tissue damage and metal electrode electrolysis. The BPG stimulators are specifically designed to facilitate generation and control of this waveform without requiring multiple timing generators, external configuration or complicated calculations. However, they also function well as simple generators of monophasic pulses and pulse trains. The inter-phase interval control is particularly useful for generating trains of monophasic pulse pairs (see Options below) with variable interval as is frequently required for refractory period determinations.

Waveform Control:





The unique aspect of the BPG series is that the second phase timing always starts at the end of the first phase regardless of first phase dura-tion. This means that the phases can never overlap and that a desired interphase interval does not have to be calculated or reset as pulse width is changed. The BPG-1 further guaran-tees perfect waveform symmetry by setting the width and amplitude of both phases from a single set of controls.

* Lilly, J.C. et al. "Production & avoidance of injury to brain tissue by electrical current at threshold values" , Electroenceph. din. neurophysiol. 7:458-9 (1955) Lilly et al, "Brief, noninjurious electric waveform for stimulation of the brain", Science, 121:468 (1955)

Description:

The BPG-1P Biphasic Pulse Generator is designed for both stand-alone manual operation and electronic interface with computers and timing sequence generators The selected output waveform (as described under Waveform Control) may be delivered as either single presentations following a manual or electronic trigger pulse. Alternatively, a train of these waveforms at a settable clock rate may be OUTPUT for the duration of a manual or electronic GATE input, as shown under Waveform Control.

All of the wave-form parameters are set by the user by means of a graphic LCD and a few pushbutton switches.
The amplitude control(s), unlike the timing controls, are designed to optimize precision setting and grading of output level over a single 0- +/-10V range. A 10-turn linear pot and dial are provided. Range setting is generally provided by the stimulus isolator and/or constant current driver such as the BAK BSI-lA Biphasic Stimulus Isolator.

The Model BPG-1P Biphasic Pulse Generator is portable and battery powered.

Specifications:

Internal Clock Rate	1 to 10,000 pulse(s) per second (continuously variable)
TRAIN/Pulse(s) Delay	Zero to 100 milliseconds (continuously variable from 10 microseconds)
Pulse(s) Width	10 microseconds to 100 milliseconds (continuously variable)
Pulse Pair Interval	10us to 10ms variable
Accuracy	+/-5 % or better on any timing parameter
Gate Input	Requires positive 3 volt pulse (TTL)
Trigger Input	Requires positive 3 volt pulse (TTL)
Pulse Modes	Monophasic positive or negative, biphasic, doublet positive or negative
Pulse Amplitude Adjust	0 to +10 volts output (continuously variable with calibrated 10 turn dial 1 % or better accuracy)
Pulse Output	Compatible with most isolators in mono-phasic mode and with BAK BSI-1, 2 in biphasic mode
Polarity	Switchable in biphasic mode from plus/minus to minus/plus
Power Requirements	(2) 3.6Volt lithium C-cell batteries
Size	9” W (22.9cm) x 3.5” (8.9cm)H x 7.5” D (19cm)
Weight	1 lb.

Other BAK equipment frequently used with BPG-1, 2:

BSI-1,2 Biphasic Stimulus Isolator (constant current/voltage source)
MDA-1 ,4 Amplifiers with stimulus delivery relays, manual and electronic gating
A-1, 1B, 2 Amplifiers with stimulus delivery relays, manually operated

Contact us at:
Bak Electronics, Inc.
41301 Silver Drive
Umatilla, FL 32784
Office: 407.324.2907
Fax: 407.308.0455
info@bakelectronicsinc.com
bakinc@rcn.com

BAK ELECTRONICS, INC.
Biomedical Instrumentation