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## Dual Impedance Research Stimulator



- Single or repetitive pulses
- External trigger input for tetanic train stimulation

### Dual Impedance Research Stimulator

This Dual Output Impedance Stimulator uses solid-state circuitry and has all necessary electronic systems to conduct experiments for teaching and advanced research. A built-in LED indicator flashes once for each output pulse which allows the user to monitor the output visually. A built-in audible monitor is also included.

The frequency is selected by a four-position calibration switch. In addition, a ten-turn multiplier control is provided ranging from 1 to 10, expanding the frequency range from 1 pulse in 10 seconds to 1,000 pulses per second i.e. 0.1 to 1000 Hz. The delay circuit provides a time delay between the synchronizing pulse and leading edge of the output pulse, allowing the oscilloscope time-base to be pre-triggered so both stimulus and effect can be displayed in an optimal position on the screen. It also permits convenient accessibility when photographic copies of traces are required. A 'Delay Off' is provided when no time delay is desired.

The pulse width is selected by a four-position calibration switch. In addition, a ten-turn multiplier control is provided ranging from 1 to 10, expanding the pulse width range from 10 microseconds to 100 milliseconds. The voltage is selectable from 0 to 150 volts via a

three-position calibration switch and 15-position multiplier control.

This stimulator has a three-position stimulus selector switch which provides either a single stimulus pulse, repetitive pulses or a tetanic train in the Gate-In position. In the single pulse position, a manual trigger switch initiates stimulus application and provides one pulse. Repetitive pulse stimulation for the preset parameters, initiates as soon as the switch is moved to the repetitive pulse position. Stimulation continues until the switch is moved from that position.

The Gate-In position provides a tetanic train conforming to the preset parameters, which is controlled by a 12 volt logic pulse supplied by a computer or another external device. More than one Stimulator may be used together by connecting the Gate-Out socket on the first Stimulator to the Gate-In socket on the second Stimulator. Now when the 12 volt logic pulse is received by the first Stimulator, both Stimulators will provide the tetanic train stimulation.

Catalog No.	Power
AH 50-7442	Dual Impedance Research Stimulator, 115 VAC, 60 Hz
AH 50-7459	Dual Impedance Research Stimulator, 230 VAC, 50 Hz

### Specifications

<b>Frequency:</b>	
Range	0.1 Hz to 1000 Hz; 1 pulse/10 sec to 1,000 pulses/sec, selectable
<b>Calibration Switch</b>	0.1, 1, 10 and 1,000 Hz, selectable
<b>Multiplier Control</b>	Selectable from 1x to 10x
<b>Pulse Delay:</b>	
Range	0.1 to 1,000 msec, selectable
<b>Calibration Switch</b>	OFF, 0.1, 1, 10 and 1,000 msec, selectable
<b>Multiplier Control</b>	Selectable from 1x to 10x
<b>Pulse Width:</b>	
Range	10 µsec to 100 msec, variable
<b>Calibration Switch</b>	0.01, 0.1, 1 and 10 msec, selectable
<b>Multiplier Control</b>	Selectable from 1x to 10x
<b>Voltage Output:</b>	
Range	0 to 150 V (floating), variable
<b>Calibration Switch</b>	0.1, 1, and 10 V, selectable
<b>Multiplier Control</b>	Selectable from 0x to 15x
<b>Output Impedance</b>	100 Ω for all ranges, additional 100 kΩ when voltage output calibration switch is in the 10 V position
<b>Synchronizing Output</b>	Triggers oscilloscope time-base, isolated from stimulator output to avoid grounding preparation
<b>Stimulus Control</b>	Single or repetitive pulses; external trigger input provided
<b>Power Consumption</b>	10 W, maximum
<b>Gate-In</b>	+12 V logic
<b>Gate-Out</b>	+12 V logic
<b>Front Panel Connectors:</b>	
Output	2 x 4 mm sockets
Earth	1 x 4 mm socket
<b>Rear Panel Connectors</b>	BNC type, Sync, Gate-In and Gate-Out
<b>Dimensions, H x W x D</b>	10 x 30 x 25 cm (4 x 12 x 10 in)
<b>Weight</b>	5 kg (11 lb)



Did you know?

Harvard Apparatus now sells products for molecular biology. See Section N for complete details.



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