

Microstim DB3 Tester V1.0

Theory of operation

The tester checks the output of a Microstim DB3 Stimulator to make sure that it is greater than 90V peak-to-peak (with the amplitude control set to maximum), when the bi-colour LED on the Microstim shows red indicating that its battery needs replacing.

Refer to the Microstim DB3 Tester circuit diagram: Microstim DB3 Tester Schematic V1.0.

When functioning correctly, a Microstim DB3 stimulator produces a minimum output of 90 volts p-p into a 1k ohm load, with the amplitude control set to maximum. The 1k ohm load simulates a patient's skin resistance.

The tester has two outputs. The first is an oscilloscope output to monitor waveforms and the second a red LED which indicates that the pulses are greater than 90V p-p.

The oscilloscope output provides a signal that is approximately one-hundredth of the amplitude of the output signal from the Microstim DB3. This is given by the ratio of the resistors R1 and R2. This signal is available from the connector, CN1.

The remainder of the circuitry controls the pulse indicating LED, D2.

Diode D1 isolates the LED circuitry from the oscilloscope output and provides uni-polar pulses to the thyristor, TH1.

Resistor R4 controls the firing of the thyristor.

Thyristor TH1 provides a "snap" action for turning the LED on, instead of a gradual turn on as the Microstim DB3's output pulse amplitude increases. This gives a LED output which is brighter and allows groups of (but not individual) pulses to be easily seen. It also means that the Microstim DB3's output can accurately be indicated to be greater than 90V p-p.

Resistor R3 current limits the LED.