

the aid of the block diagram in Fig. 21. Briefly, in the standby state a transistor gate is held open, maintaining a current in the inductor. Prior to arrival of the stress wave at the gauge the supply is triggered externally. The electronic switch opens a silicon control rectifier and closes the transistor gate, rerouting the current through the gauge.

A schematic of a working constant current supply is shown in Fig. 22. Normal operating voltage and current is 50 volts and 0.5 amperes. This is supplied by a stable (less than 0.1% fluctuation) floating voltage source.

The constant current supply completes an operational cycle in the following manner. Upon closing switch S1, the potential on the anode of SC1 comes to 50 volts. This turns on transistors T2 and T1 respectively. In this standby state current follows the path from the supply through inductor I1, transistor T1, and then returns. The base current for transistor T2 which must traverse the gauge element is less than one milliamp and hence constitutes no heating danger to the gauge element. To switch the supply to the active state, a positive pulse is injected at the trigger input. This trips SC2, discharging capacitor C1 across transformer TF1. This ramp pulse is coupled through TF1 and trips SC1. The potential across SC1 drops to zero. This turns off transistors T2 and T1. The current is then rerouted through the gauge and SC1. After approximately fifty microseconds, the variable delay consisting of the UN914 trips SC4. The pulse is coupled through TF3, which in turn trips SC5. The opening of SC5 relieves the gauge of the current. This protects the gauge from overheating while pulsing the supply during preliminary setup. Previously, when SC2 tripped, the pulse was also coupled through transformer TF2 and tripped SC3. The discharge of capacitor C2 through the coil of relay R1 eventually mechanically breaks the current circuit and allows SC1 and SC5 to reset. The time for this to occur is approximately two milliseconds. The high back-emf inevitably produced by the inductor when the circuit is broken is limited by the ignition of a neon