

TG-75 Trigger Generator



Features

- *Fast-risetime, high-voltage pulser generates over 75 kV into high-impedance loads*
- *Fiber-optic trigger and isolated power assures safe, reliable operation in high-current capacitor banks*
- *Ideal trigger source to fire L-3 Communications Pulse Sciences ST-300A series injection spark gaps, mid-plane and trigatron switches*
- *Ready status and charge voltage level available for local and remote monitoring*



Specifications

Output Voltage into 60 μH, 40 pF:	55 kV*
Pulse Risetime into 60 μH, 40 pF:	<90 ns (10%-90% of voltage peak)
Output Pulse Polarity:	Negative**
Throughput Delay:	< 1 μs
Timing Jitter:	< 200 ns (1 std. dev.)
Output Capacitance:	270 pF

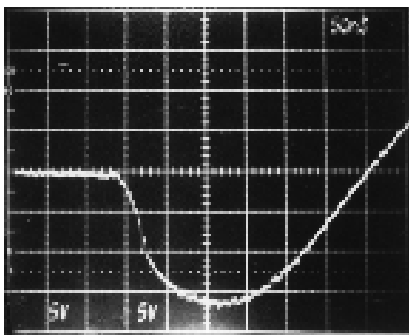
The TG-75 trigger generator offers two status check points on the front panel: (1) a 0-10 Vdc monitor of the charge voltage accessible through electrical terminals, and (2) a charge "ready" LED light, available as a visual indicator that the unit is armed and ready

to fire, or as a remote monitor via plastic fiber-optic for up to a 100-meter distance.

* Over 75 kV into 2 k Ω load

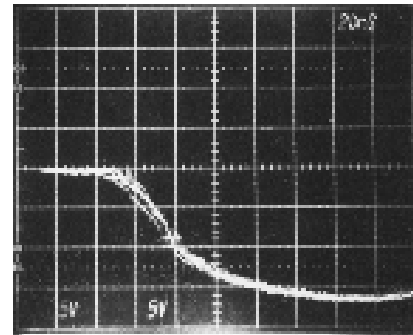
** Positive output pulse models are available upon request

Output Voltage



25 kV/div
50 ns/div

5-Pulse Overlay



25 kV/div
50 ns/div

Options

- A. Input ac transformer** for 25 kV isolation (20 VA).
- B. Coupling package** for dc and transient isolation of TG-75 in high-voltage, high-energy circuits. Consultation with Titan Pulse Sciences Division regarding your specific application needs is recommended.
- C. 240Vac input** (120Vac standard) – To be specified upon ordering.
- D. Positive Polarity Output Voltage** (negative output standard) – To be specified upon ordering.
- E. Fiber-optic Trigger Unit** available as a single transmitter, or with built-in delays for multiple-channel operations.

Shipping Weight

Approximately 26.5 lbs

Overall Dimensions

Approximately 8-2/3 in. x 9 in. x 31 in.

System Operations

I. Triggering – The fiber-optic receiver in the TG-75 is a Hewlett Packard #HFBR-2402 receiver. It should be driven by a #HFBR-1402 transmitter, or equivalent, producing an output signal of -20 dBm at a wavelength of 820 nm. Pulse width is ≥ 200 ns with a risetime of ≤ 20 ns. Recommended cable is a 62.5 μm core/125 μm cladding multi-mode, general purpose fiber-optic. The optional trigger transmitter can be ordered from Maxwell Physics International.

II. Input Power – 120 Vac (or 240 Vac Option), 50-60 Hz, 20 VA max. For many pulse power applications, a low-capacitance isolation transformer is recommended.

III. Grounding – The TG-75 is designed to operate as a “floating deck” device. The ac line input to the transformer primary is connected to a terminal strip supplied with the

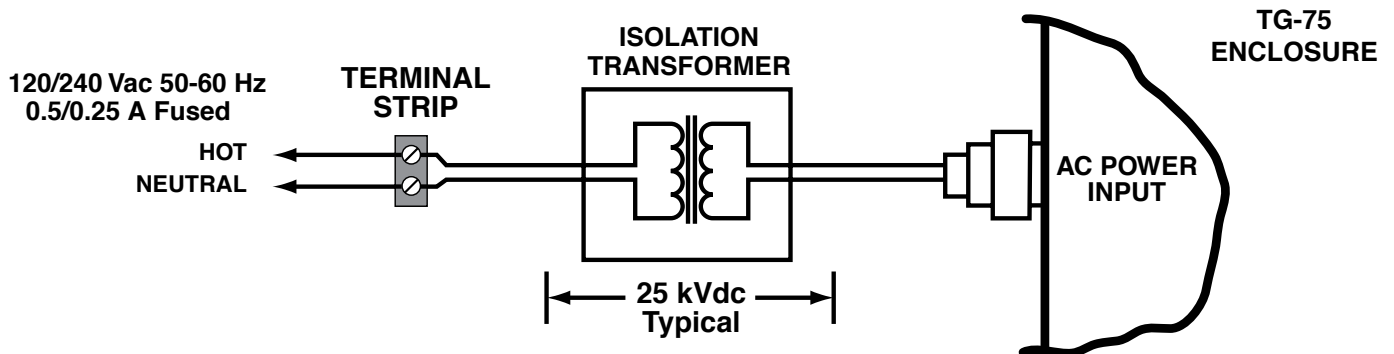
transformer. The secondary leads are two feet in length and are factory-equipped with the input plug. MPI’s optional isolation transformer provides an isolation of $\approx 25\text{kV}$.

For a direct line operation without the isolation transformer, a pig-tailed line cord is provided. It is recommended that the ground lead be connected to an earth ground.

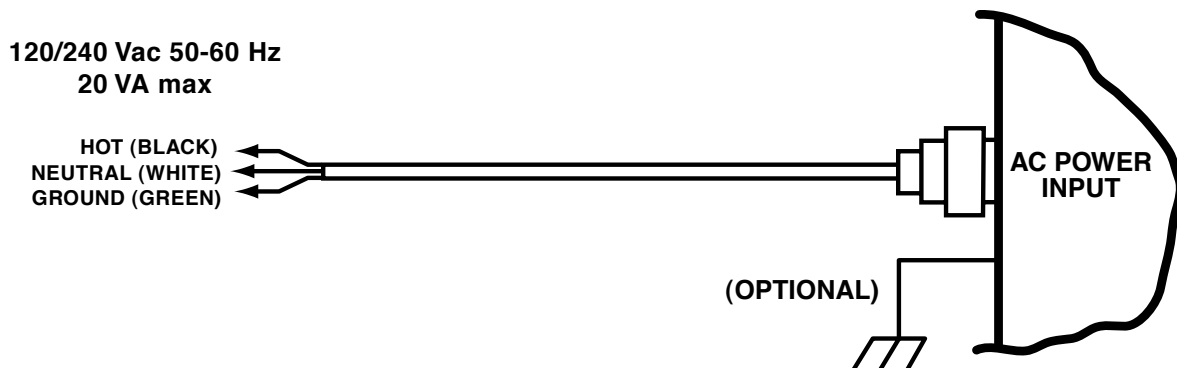
The user has the option of not connecting the green wire to the earth or conduit ground, to float the enclosure to ≈ 1 kV. Operating the TG-75 without the grounded wire tied to earth or conduit ground can create a shock hazard.

IV. Mounting – Four 1/4-20 bolt locations are available for mounting of the TG-75 from the front panel. The penetration depth Δ 1 0.5 in` e +

Floating Deck



Direct Line

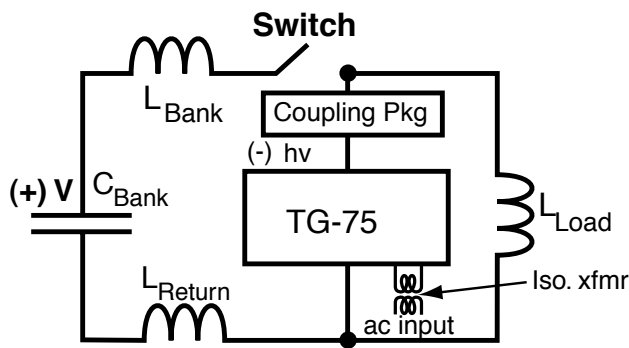


Typical Applications in Capacitor Bank Circuits

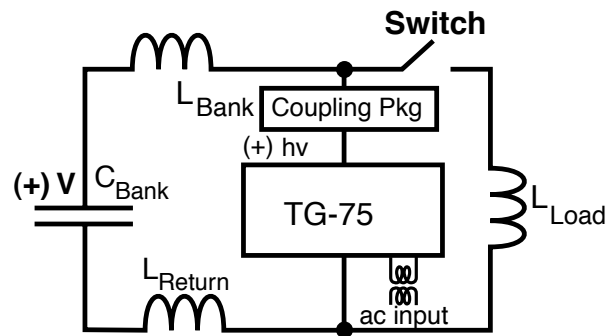
A "Coupling Package" (sketched below) may be necessary for operation in high-voltage capacitor banks employing series injection spark gaps (such as TPSD ST-300A), or mid-plane and trigatron switches. Major components in the coupling package are: (i) a series blocking capacitor, typically a few nanofarads at >80 kV, (ii) a series

current limiting resistor, and (iii) a shunt ground reference resistor. Items (ii) and (iii) are needed when the TG-75 is connected to an illuminator spark plug component of the switch. Please contact L-3 Communications Pulse Sciences to discuss your application circuits.

A. TG-75 Capacitor Bank Circuit (Ground) Return

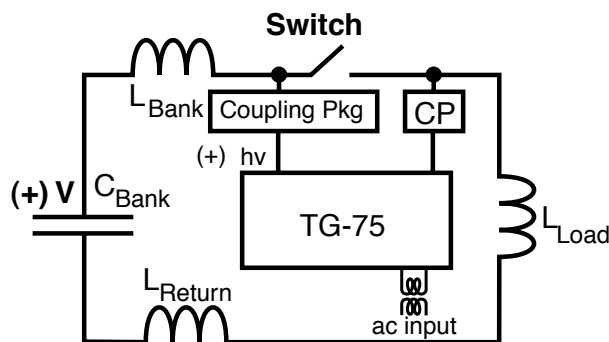


- Safest configuration for TG-75 when there is a diode crowbar connected across the capacitor bank
- Can put high voltage pulse on load



- No significant high voltage pulse on load
- Requires inductive isolation of the TG-75 from the capacitor bank (and the diode crowbar, if present)

B. TG-75 in Floating Deck Configuration



- Magnitude of voltage pulses appearing on the load and capacitor bank would be difficult to determine a priori.

