

# T-150 Spark Gap Switch and TG-1292 Trigger Generator

## Spark Gap Replacement for Ignitrons

For use in:

- Electromagnetic Guns
- Electrothermal Guns
- High-energy Capacitor Bank Applications
- Repetitively Pulsed Modulators



## General Description

L-3 Communications Pulse Sciences has developed the new T-150 gas spark gap and TG-1292 trigger generator as an environmentally safer, more functional, and cost effective replacement for ignitrons (with performance comparable to size "D" ignitrons). The many advantages of this switch over conventional ignitrons include the absence of mercury and associated toxic waste disposal problems; the versatility of orientation-independent applications; high shock and vibration tolerance allowing applications on mobile platforms; bipolar operation; and no thermal conditioning requirements. The switch package offers easy maintenance and rapid electrode replacement.

## Applications

The T-150/TG-1292 is designed for use as a series switch in electromagnetic and electrothermal guns or for other high-energy capacitor bank applications, such as food processing modulators.

Rugged construction and integral coaxial ground return make it particularly well-suited for very high energy systems where high currents and/or charge transfer are generated.

The T-150 switch is available in two versions: the T-150 and the T-150R version. The R version uses different trigger electrodes which will extend the shot number life at the expense of the electrode coulomb life. Consult L-3 Communications Pulse Sciences for the application which will best suit your needs. The switch has handled single-shot currents to 300 kA and has transferred 120 coulombs in a single shot with no damage. Actual limitations have yet to be established. In repetitive rate application the switch/trigger package has been demonstrated beyond 10 Hz at reduced currents.

The trigger generator has fiber-optic isolation to ensure safe, reliable operation in high-current systems. An ac-powered, isolation transformer-fed version can be customized for enhanced average power, high repetitive performance.

## T-150 Spark Gap Switch Specifications

|                                    |                          |                                      |                                  |
|------------------------------------|--------------------------|--------------------------------------|----------------------------------|
| Operating Voltage:                 | 20-40 kV                 | <b>Repetitive Operation T-150R**</b> |                                  |
| Switching Gas:                     | Dry Air                  | Peak Currents and Rep. Rates:        | 7 kA* at 10 Hz<br>15 kA* at 3 Hz |
| <b>Single-Shot Operation T-150</b> |                          | Gas Flow Rate:                       | > 30 scf/hr                      |
| Peak Current:                      | 300 kA*                  |                                      |                                  |
| Charge Transfer:                   | 120 coulomb per shot     |                                      |                                  |
| Action:                            | 16 MJ/ $\Omega$ per shot |                                      |                                  |

\* Limits are not yet established.

\*\*Voltages applied to the switches should be “inhibited” between pulses to allow for proper switch recovery.

## TG-1292 Trigger Generator Specifications

|                           |  |
|---------------------------|--|
| Output Voltage:           | 7 kV into open circuit   |
| Rep-Rate:                 | 10 Hz  |
| Trigger Input Pulsewidth: | 2 $\mu$ s $\pm$ 10%  |
| Fiberoptic Trigger Input: | 820 nm, $\geq$ -20 dBm typ.<br>62.5 $\mu$ m glass core diameter<br>SMA connector |

## Dimensions and Mounting

|          |  |
|----------|--|
| T-150:   | 8 in. dia., 11 in. height, approx. 20 lbs. |
| TG-1292: | 9 in. x 9 in. x 11 in., approx. 10 lbs.    |

High-current connections to the switches are made on the two flanges at one end of the switch. Gas and trigger connections are made at the bottom flange. For further details on installation and operation procedures, please contact L-3 Communications Pulse Sciences.

