



# USING TYPE 7115-1 OR 7115-2 HIGH VOLTAGE TRANSIENT PULSE TRANSFORMER AND TYPE 7510-1 SPARK GAP

The **Type 7115-1 Transient Pulse Transformer** is designed to be plugged into the SERIES output terminals of the **Model 6254-5S Transient Generator** to step up the transient or “spike” voltage. The **Type 7115-2 Transient Pulse Transformer** is designed to be plugged into the SERIES terminals of the **Model 8282-1 Spike Generator**. When specifications require a static discharge to the shield or case of the equipment under test, the **Type 7510-1 Spark Gap** can be useful.

The Pulse Transformers are in an insulated case measuring 3" x 3.8125" x 4" and fitted with banana plugs on the primary for insertion in the output terminals of the transient generator.

The **7510-1 Spark Gap** is designed to be mounted directly on the output terminals of the **Type 7115-1** or **7115-2** transformer, or used at a remote point by means of interconnecting leads. The basic setup is shown on the back of this page.

The **Type 7510-1 Spark Gap** is supplied with electrodes which are pointed on one end and spherical on the other, so that either style may be used by reversing the way they are mounted.. A spacer block can be made to a given dimension and used as a jig to position the points the correct distance apart. The gap dimension should never exceed 0.5" since the spark will then tend to jump across the structure of the **Type 7510-1** instead of the gap.

Using the amplitude adjustment on the spike generator, the output of the **Type 7115-1** or **7115-2** can be raised from about 500 volts to 15 kilovolts peaks. The shape of the transient is essentially the same as that produced by the generator unless the voltage breaks down the gap between the output terminals of the transformer (or gap in wiring connected to the terminals). The output terminals are ceramic insulated with metal parts separated by at least 0.5".

The transient pulse or resultant spark across a circuit is adjustable from 0.5 to 500 p.p.s. using the repetition rate controls on the spike generator.

Since the output of the transformer is a very high impedance, any capacitance across it will reduce the available output voltage. Ideally, keep the interconnecting leads less than 6". The wire from the transformer to the spark gap should be spaced away from any wire or structure which acts as a ground plane. The spark gap can be either mounted directly to the case of the equipment under test or connected with a very short wire.

The applied spark voltage can be adjusted by properly spacing the spark gap distance. With a spark gap in dry air at sea level and room temperature, the approximate voltage required to break down the gap is:

Peak Voltage	7510-1 Needle Gap	7510-1 Spherical Gap
5 KV	0.15" (3.8 mm)	0.049" (1.24 mm)
10 KV	0.33" (8.4 mm)	0.10" (2.54 mm)
15 KV	0.60"(15.2 mm)	0.17" (4.32 mm)



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## APPLICATION INFORMATION ON HIGH VOLTAGE SPARK TESTS (continued)

After the gap distance has been adjusted, set the controls of the spike generator to 1 p.p.s. and minimum amplitude. Turn on the generator and slowly increase the amplitude until a consistent spark jumps the gap once every second. Increasing beyond this level will not increase the voltage since the breakdown of the gap limits the voltage. At faster repetition rates it is possible to reduce the amplitude after a few seconds since the air in the gap ionizes and breaks down at a lower voltage. It is recommended that the test be performed at low repetition rates or with the pushbutton for manually applied single discharges.

