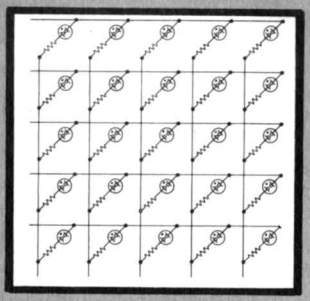
Signalite
APPLICATION NEWS
A General Instrument company



VOL. I, NO. 1

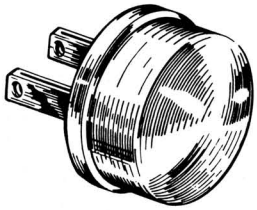
New Glow Lamp Application Forum

The increasing acceptance of the neon glow lamp as a reliable circuit component has dramatically increased the need for application information. It is our intention through this newsletter to:

1) give application examples—both general and specific

2) publish application problems that you send to us.

Since this newsletter is circulated to 7,000 design engineers, we will not only offer solutions to your particular application problems, but we also invite comment from our design readers. All letters will be answered whether they are used or not.



To add further interest a Signalite Owl Eye Nite Lite for the home will be sent free to each person who sends in a problem or solution.

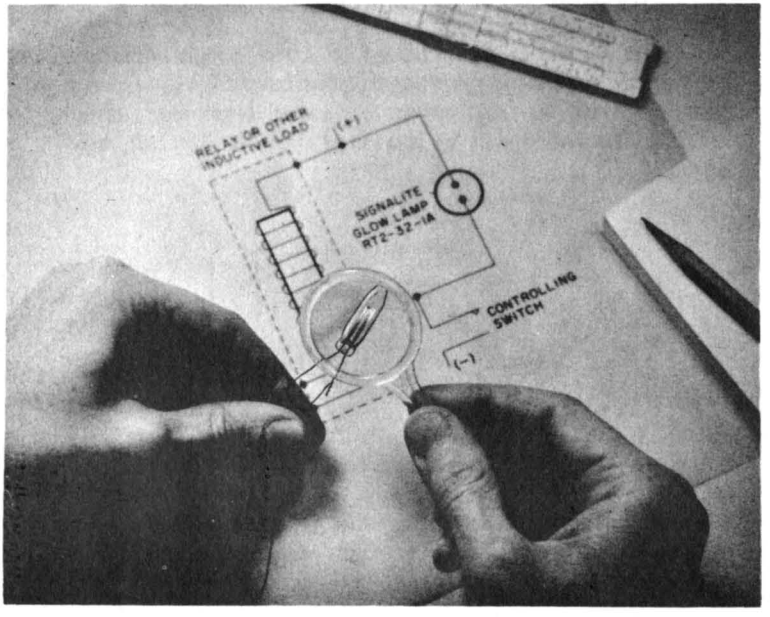
Glow Lamps Used to Suppress Arcing — Lengthen Contact Life

One of the most useful of the basic characteristics of the glow lamp is that it maintains a constant operating voltage over a wide operating current range. Because of this glow lamps are being used in a variety of applications as voltage regulators, surge protectors, and other regulatory devices.

This property has been applied advantageously to prolong the life of switch contacts used with relays and other inductive devices.

When the current through an inductive load is opened, the counter electromotive force may theoretically reach an infinitely high voltage at the switching instant. In actual practice, of course, the limitations imposed by leakage, resistance, inductance, and capacitance will prevent this force from exceeding 10,000 volts normally. This force is sufficient to break down across the gap of the open contacts, creating an arc which wears away some of the metal and shortens the contact life.

This problem has been eliminated in many cases by the addition of a simple neon glow lamp to the circuit. The lamp is placed across the relay coil as shown in the illustration. When non-conducting, it does not affect normal circuit operation.



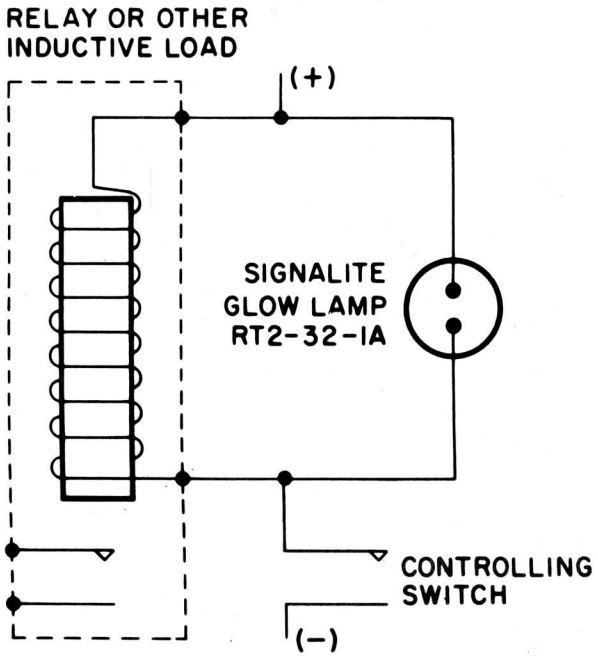
Under the sudden surge of counter emf when the contacts are opened, the lamp breaks down and ignites. The stored energy

in the coil then discharges very rapidly through the lamp. The voltage across the coil is held to the maintaining voltage of the lamp until such time as the coil-counter-emf falls below this maintaining voltage. At that point the lamp will extinguish.

When the lamp is operating, the voltage is maintained at a sufficiently low level to prevent arcing across the open gaps in the normal spacing of relay switch contacts.

The effect of these current surges on lamp life and lamp characteristics is a function of the amplitude and rate of the surges. Under normal conditions in circuits with relay switches, the duration of the surge is of such a short time that extremely high amplitudes can easily be tolerated without serious detriment to the life of the lamp.

Choice of the specific neon glow lamp to be used in this type of application will depend on the operating voltage and current of the relay in the circuit. It is important to remember, however, that the maintaining voltage of the lamp must be higher than the relay operating voltage. Currently available lamp types have been designed with maintaining voltages ranging from 50 to 150 volts d.c. Initial breakdown voltages range from about 55 to 220 volts d.c.



The Signalite RT2-32-1A lamp used in the illustration has frequently been used for this type of application. It has an initial breakdown voltage of 70-82 volts in light, and 70-90 volts in darkness. The maintaining voltage is 55-65 volts. Extinguishing voltage is 50 volts minimum.

Typical circuit component applications for Signalite Glow Lamps:

Counters	Timing
Voltage Regulators	Trigger
Voltage Dividers	Film Markers
Digital Readouts	Pulse Generators
Oscillators	Photo-Cell Drivers
Coupling Devices	Flip-Flops
Switches	Gating
Memory	Relay
Surge Protectors	Time Delay
Limiters	Photo Choppers
References	Amplifiers
Logic Circuits	Noise Generators
Resistors	

If you have a circuit design problem involving the use of glow lamps, or have developed a circuit in which glow lamps are important for design and/or economic reasons, we would like to discuss your application in a future issue of this newsletter.

Applications which in the opinion of Signalite have significant interest will also be brought to the attention of the editors of the leading technical publications for consideration as articles and featurettes. Your by-line and company credit will be given with your permission.

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