



# engineering data service

## electronic products

SYLVANIA **SN4**  
**1D21/SN4**

### STROBOTRON TYPE SN4 & 1D21/SN4 DESCRIPTION

The Types SN4 and 1D21 Strobotrons are internally-triggered, cold-cathode, inert-gas-filled electronic tubes which are capable of excellent service in condenser discharge circuits involving high peak currents at low average currents. One of their primary uses is as a source of stroboscopic light pulses of short duration. As a stroboscopic tube, the Strobotron provides a neon-red flashing light under whose illumination rotary and reciprocatory motion may be studied. The frequency of the flashes is easily controlled over relatively wide limits, the maximum pulse frequency being 60 pulses per second for the SN4 and 240 for the 1D21/SN4. For flexibility, two internal grids are incorporated, allowing adaptation to a wide variety of driving circuits. The intensity of the light is sufficient for visual observation.

The SYLVANIA Types SN4 and 1D21/SN4 Strobotrons are of equal value as electronic relays or controls wherever high peak currents but low average currents are desired. With these tubes, switching is possible without the interruption of service which results from deterioration of moving parts and contacts. Best results for high-current operation may be expected when the circuit constants are so proportioned as to give peak cathode currents of from 10 to 200 amperes at average levels of 50 milliamperes or less. Under favorable duty cycle conditions, peak currents as high as 300 or 400 amperes are possible.

### AVERAGE CHARACTERISTICS AND RATINGS MECHANICAL SPECIFICATIONS

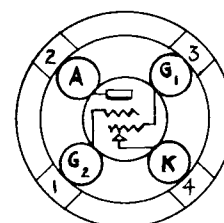
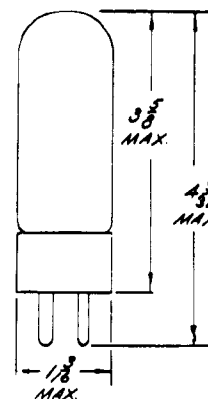
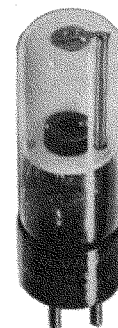
|                             |             |
|-----------------------------|-------------|
| Envelope . . . . .          | T9          |
| Base . . . . .              | Small 4 pin |
| Mounting Position . . . . . | Any         |

### ELECTRICAL RATINGS AND OPERATING CONDITIONS

|                                                |                          |
|------------------------------------------------|--------------------------|
| Anode Voltage . . . . .                        | 300 volts max.—Note 1    |
| Peak Inverse Anode Voltage . . . . .           | 50 volts max.            |
| Average Cathode Current . . . . .              | 50 ma. max.              |
| Peak Cathode Current . . . . .                 | 5 amps. min.—Notes 2 & 3 |
| Grid Firing Voltage . . . . .                  | 80-125 volts—Notes 4 & 5 |
| Control Grid Bias Voltage . . . . .            | —50 to +50 volts         |
| Shield Grid Bias Voltage . . . . .             | —50 to +50 volts         |
| Average Grid Current . . . . .                 | 15 ma. max.              |
| Minimum Trigger Grid Current (Surge) . . . . . | 1 ma.                    |
| Control Grid Circuit Resistance . . . . .      | 5 megohms max.           |
| Pulse Frequency { SN4 . . . . .                | 60 p.p.s. max.           |
| { 1D21/SN4 . . . . .                           | 240 p.p.s. max.          |
| Tube Voltage Drop                              |                          |
| Glow Discharge . . . . .                       | 75 volts approx.         |
| Arc Discharge . . . . .                        | 20 volts approx.         |
| Ambient Temperature Range . . . . .            | —55 to +90° C            |

Note 1. Measured between shield grid and anode.  
Note 2. Current required to initiate arc discharge.  
Note 3. Maximum anode circuit capacitance, 50  $\mu$ f.  
Note 4. Applied to shield grid, zero bias on control grid.  
Note 5. Average starting range. Holds only for tubes used in approved circuits under specified conditions. Circuit design should provide for a trigger pulse of at least 175 volts. Tube may be started by initiating glow discharge between grids or between either grid and cathode. Either grid may be used for control with proper bias on the remaining grid.

### MECHANICAL DATA

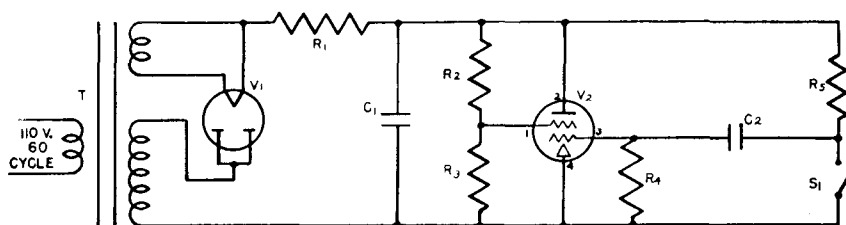


# SN4 1D21/SN4

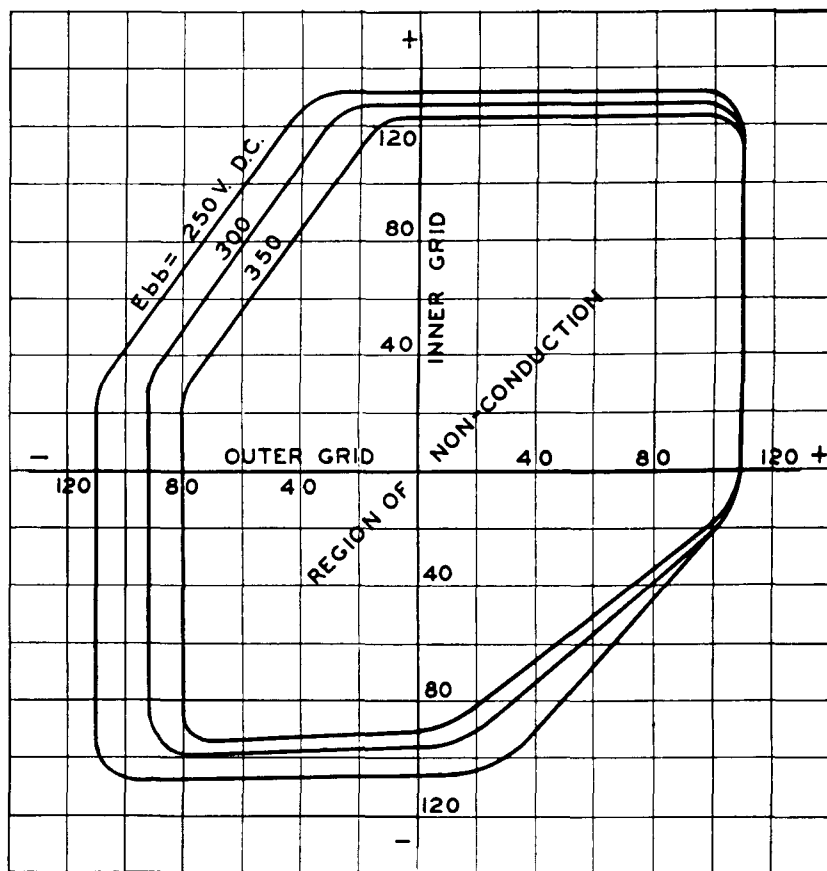
## TYPICAL CIRCUIT

The circuit shown below is only one of many which may be used to operate the SN4 and 1D21/SN4. The switch  $S_1$  is ordinarily operated either mechanically or electronically. In general, circuits are designed around specific applications. SYLVANIA engineers invite inquiries concerning your particular problems.

**PATENTS**—SYLVANIA Strobotron tubes are licensed under Edgerton, Germeshausen & Grier patents 2,185,189 and 2,201,167.



T Power Transformer  
 $C_1$  2  $\mu$ f, 600 W.V.D.C.  
 $C_2$  0.03  $\mu$ f, 600 W.V.D.C.  
 $R_1$  3000 ohms, 10 watts  
 $R_2$  1.0 megohm, 1 watt  
 $R_3$  0.1 megohm, 1 watt  
 $R_4$  1.0 megohm, 1 watt  
 $R_5$  0.1 megohm, 1 watt  
 $S_1$  Momentary Contact Switch  
 $V_1$  Low Voltage Rectifier  
 $V_2$  Type SN4 or 1D21



## TYPICAL DYNAMIC CHARACTERISTICS

If the vector sum of the grid voltages lies within the region on non-conduction, the tube will not fire, but as soon as the voltage on either grid reaches a value outside of the critical limits portrayed in the curve above, the tube will fire. (Note: This graph is indicative of general behavior only.)