SYLVANIA

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

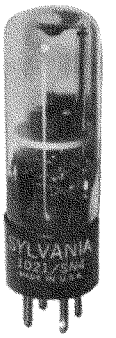
Envelope	T9
Base	Small 4 pin
Mounting Position	Any

ELECTRICAL RATINGS AND OPERATING CONDITIONS

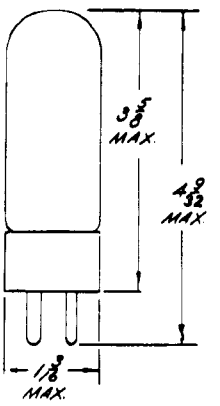
Anode Voltage	300 volts max.—Note 1
Peak Inverse Anode Voltage	50 volts max.
Average Cathode Current	50 ma. max.
Peak Cathode Current	5 amps. min.—Notes 2 & 3
Grid Firing Voltage	80-125 volts—Notes 4 & 5
Control Grid Bias Voltage	−50 to +50 volts
Shield Grid Bias Voltage	−50 to + 50 volts
Average Grid 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.
Pulse Frequency 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

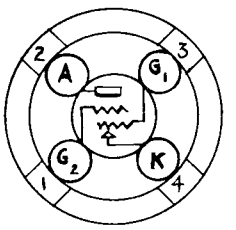
Note 1. Measured between shield grid and anode.
Note 2. Current required to initiate arc discharge.
Note 3. Maximum anode circuit capacitance, 50 μf.
Note 4. Applied to shield grid, zero bias on control grid.
Note 5. Average starting range. Holds only for tubes used in approved circuits under specified 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







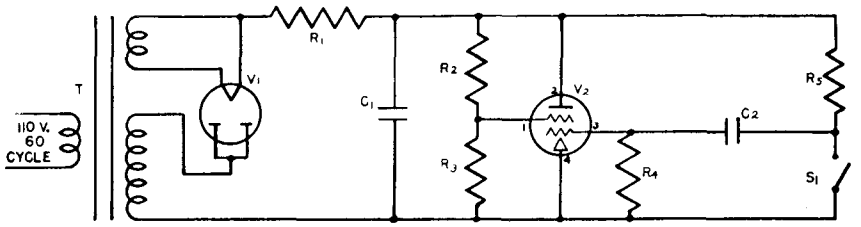


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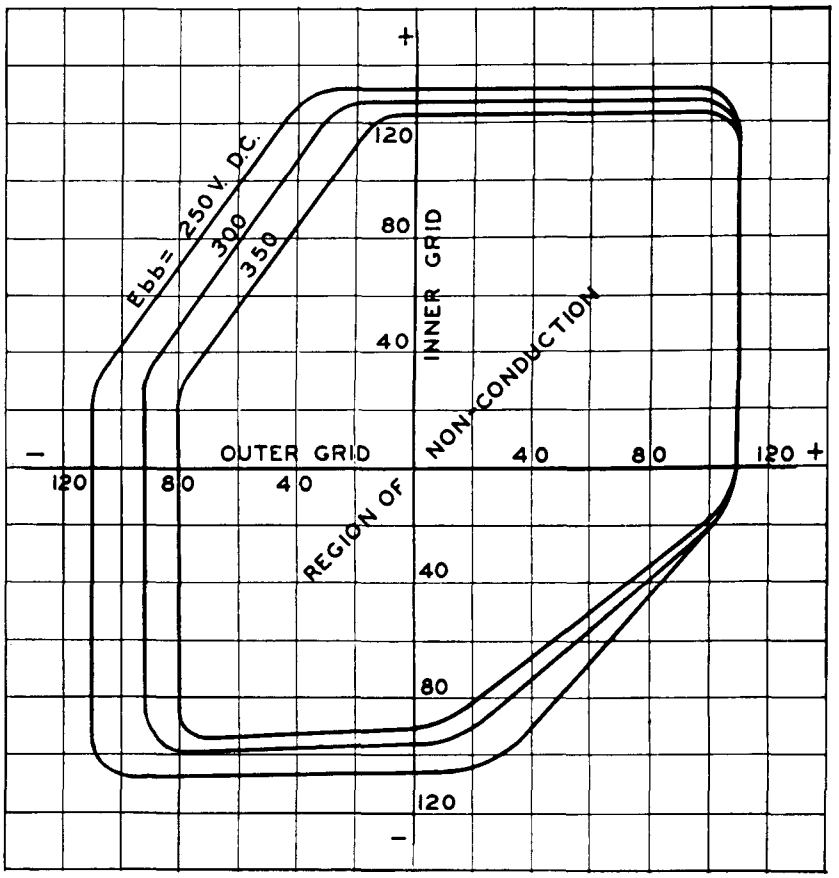
TYPICAL CIRCUIT

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 liscensed under Edgerton, Germeshausen & Grier patents 2,185,189 and 2,201,167.



T Power Transformer
C_1 2μf, 600 W.V.D.C.
C_2 0.03 μf. 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.)