



ELECTRONIC TUBE REFERENCE

1B59

Voltage Regulator electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

VOLTAGEREGULATOR

Sylvania cold-cathode voltage regulator for heaterless DC stabilization and reference service; surviving manufacturer data provide limited additional electrical detail.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Voltage Regulator

No fixed ratings recorded.

Physical section extracted from supplied datasheet.

1B59 — Glow Modulator and Current Regulator Tube

The designation **1B59** refers to two distinct classes of electron devices depending on the manufacturing design and application: a cold-cathode glow modulator tube used for light modulation, and a hydrogen-filled barettor (current regulator) designed for current stabilization.

Glow Modulator Construction and Physical Specifications

In its glow modulator configuration, the 1B59 is a cold-cathode tube housed in a T-9 glass bulb. The bulb features a specialized coating with a clear top to allow the modulated light output to exit the envelope.

The physical dimensions and mounting specifications for this configuration are:

- **Mounting Position:** Any
- **Maximum Diameter:** 1 5/16" (1.32")
- **Maximum Overall Length:** 3 1/4" (3.25")
- **Maximum Seated Height:** 2 21/32" (2.65")

The tube is constructed with an Intermediate Shell Octal 2-pin base. The electrical connections are assigned as follows:

- **Pin 3:** Cathode
- **Pin 7:** Anode

Glow Modulator Electrical Ratings and Operating Conditions

The glow modulator variant is designed to translate electrical current variations into corresponding light intensity variations across a wide frequency spectrum.

Absolute Ratings and Limits

- **Maximum Starting Voltage:** 225 Vdc
- **Maximum Operating Voltage:** 140 Vdc
- **Maximum Operating Current:** 35 mA_{dc}
- **Minimum Operating Current:** 5 mA_{dc}
- **Modulating Frequency Range:** 15–15,000 cps
- **Useful Light Range:** 3,500–6,500 Å

Typical Operating Point

For standard operation, the tube is configured with an external series protective resistance to limit the current and stabilize the discharge. The typical operating parameters are:

- **Anode Supply Voltage:** 250 Vdc
- **Operating Current:** 30 mA_{dc}
- **Series Protective Resistance:** Approximately 3,000 ohms

Using these typical operating parameters, the voltage drop across the series protective resistor can be calculated as: $\text{Voltage Drop} = 0.030 \text{ A} \times 3,000 \Omega = 90 \text{ V}$ Subtracting this drop from the 250 Vdc anode supply voltage leaves an operating voltage across the tube electrodes of 160 Vdc under these typical conditions.

Hydrogen-Filled Baretter Variant

Under the same 1B59 designation, there is also a Russian-manufactured baretter (current regulator). This device is structurally and functionally distinct from the cold-cathode glow modulator. It is designed to

maintain a constant current flow despite fluctuations in supply voltage.

Construction and Physical Properties

- **Envelope:** Glass
- **Gas Filling:** Hydrogen
- **Mass:** 70 g

Stabilization and Voltage Ratings

The baretter operates by varying its resistance in response to temperature changes caused by current flow through its filament, thereby regulating the circuit current. Its electrical ratings include:

- **Nominal Stabilized Current:** 1000 (with a minimum stabilized current of 960 and a maximum of 1040)
- **Nominal Voltage:** 7 (with an operating range from a minimum of 5 to a maximum of 9)

Technical Summary

The **1B59** designation encompasses two highly specialized, non-interchangeable device types:

1. A **cold-cathode glow modulator** featuring a T-9 glass bulb with a clear top, an octal 2-pin base, and a modulating frequency range of 15 to 15,000 cps. It operates at a maximum of 140 Vdc with a typical current of 30 mAdc, producing a useful light range of 3,500 to 6,500 A.
2. A **hydrogen-filled baretter** current regulator with a mass of 70 g, designed to stabilize current at a nominal value of 1000 across an operating voltage range of 5 to 9.

Both devices represent distinct historical approaches to electronic control and modulation within glass envelopes, requiring careful attention to the specific physical and electrical characteristics of the variant in use.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1950 SYLVANIA

Section 1 · Voltage Regulator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Series Protective Resistance (Approx.) 3000 ohms	3000 ohms	Series Protective Resistance (Approx.) 3000 ohms