



ELECTRONIC TUBE REFERENCE

102E

Voltage - Triode (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Filamentary detector and amplifier triode for low-level signal service, with a 160-volt maximum safe plate voltage.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	4
NOMINAL HEATER	2.25 V / 950 mA	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
PLATE RESISTANCE	70000 Ω
AMPLIFICATION FACTOR	30
MAXIMUM PLATE VOLTAGE	160 V
<p>Early directly heated detector/amplifier triode. Published plate-to-filament impedance 40,000–100,000 ohms and amplification constant 26–34; promoted plate resistance 70,000 ohms and amplification factor 30 are arithmetic midpoints, not separately specified nominal values. Filament voltage 2–2.5 V (stored tube nominal midpoint 2.25 V), current 0.95 A. Exceeding 1.15 A filament current materially shortens life. Datasheet operating values apply to amplifier service.</p>	

102E Vacuum Tube

A triode vacuum tube designed for detector and amplifier service, featuring a high amplification constant and low-voltage filament operation.

Overview

The **102E** (also designated as the **102-E**) is a vacuum tube designed for use as a detector and an amplifier. It is engineered for compatibility with Western Electric Vacuum Tube Sockets Nos. 100-L or 100-R. The tube features a classic spherical bulb construction with a specialized four-pin bayonet base.

Physical Construction and Basing

The 102E is constructed with a glass envelope having a maximum bulb diameter of 2-3/8 inches and an overall height of 4-1/2 inches. The tube utilizes a cylindrical base equipped with a side-mounted locating pin (bayonet pin) to ensure correct orientation when inserted into its socket.

The base configuration consists of four pins on the bottom, arranged as follows:

- **P**: Plate (Anode)
- **F+**: Filament positive terminal
- **F-**: Filament negative terminal
- **G**: Control Grid

The locating pin is positioned on the side of the base adjacent to the filament-negative and grid pins.

Electrical Characteristics and Amplifier Operating Points

When operated as an amplifier, the 102E exhibits specific electrical parameters. The filament is designed for low-voltage, moderate-current operation, and the tube operates with relatively low plate currents and a high amplification factor.

Filament Ratings

- **Normal Filament Voltage:** 2 to 2.5 Volts
- **Normal Filament Current:** 0.95 Ampere

The filament current is a critical factor in determining the operating life of the tube. To ensure maximum useful life, the filament current should be maintained at the lowest possible level that still secures the desired output. Operating the filament above a current of 1.15 amperes will materially shorten the service life of the tube.

Amplifier Operating Parameters

Under normal operating conditions as an amplifier, the electrical characteristics are defined by the following ranges:

Parameter	Value Range
Normal Plate Voltage	100 to 150 Volts

Parameter	Value Range
Maximum Safe Plate Voltage	160 Volts
Normal Grid Voltage	0 to -3 Volts
Normal Plate Current	0.3 to 1.5 Milliamperes
Plate-to-Filament Impedance	40,000 to 100,000 Ohms
Amplification Constant	26 to 34

Circuit Applications and Variations

The 102E is versatile, serving as both a detector and an amplifier. While the standard electrical values and operating ranges listed above apply specifically to its use as an amplifier, these parameters are not rigid when the tube is employed in other roles.

When the 102E is configured as a detector or for alternative circuit applications, the applied voltages may be varied to suit the specific requirements of the circuit. Adjusting these applied voltages will result in corresponding variations in the other electrical values, such as plate current and plate-to-filament impedance, allowing the tube to be optimized for different operating conditions.

Technical Summary

The 102E is a detector and amplifier triode characterized by its physical dimensions of 2-3/8 inches in diameter and 4-1/2 inches in height, designed for Western Electric Nos. 100-L or 100-R sockets. It features a four-pin bayonet base with a locating pin. Electrically, it operates with a 2 to 2.5 V filament drawing 0.95 A normally, with a strict maximum limit of 1.15 A to prevent premature filament degradation. In amplifier service, it operates with plate voltages between 100 and 150 V (160 V maximum safe limit), grid bias of 0 to -3 V, and plate currents of 0.3 to 1.5 mA. It provides an amplification constant of 26 to 34 and a plate-to-filament impedance ranging from 40,000 to 100,000 ohms, with adaptable operating parameters when configured for detector applications.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

2026 Western Electric 100s

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

2026 WESTERN ELECTRIC 100S

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament voltage	2.25 V	—
Filament current	950 mA	—
Maximum plate voltage	160 V	—
Filament voltage	2–2.5 V	Amplifier use
Plate current	0.3–1.5 mA	Amplifier use
Plate voltage	100–150 V	Amplifier use
Grid voltage	0–3 V	Amplifier use
Filament current life caution	1.15 A	Exceeding this materially shortens life

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate-to-filament impedance	40000–100000 ohm	Amplifier use
Amplification constant	26–34	Amplifier use

TUBE TINKER

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