



ELECTRONIC TUBE REFERENCE

12E14

Power - Beam (NOT sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Industrial beam tetrode with 35-watt maximum anode dissipation, designed for stabilized power-supply applications and electronic control service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	8
NOMINAL HEATER	6.3 V / 1.6 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Beam Power	
MAXIMUM PLATE VOLTAGE	800 V
MAXIMUM SCREEN VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	35 W
MAXIMUM SCREEN DISSIPATION	5 W
MAXIMUM CATHODE CURRENT	300 mA

12E14 — Indirectly Heated Beam Tetrode

An indirectly heated beam power tetrode designed for high-power applications, specifically optimized for use as a series regulator or control element in stabilized power supply units.

Overview

The **12E14** is a robust, indirectly heated beam tetrode manufactured by Associated Electrical Industries (AEI) under the Ediswan brand. Characterized by a high anode dissipation rating of **35 W** and a

substantial cathode current capability of **300 mA**, this tube is primarily designed for service in stabilized power supply units. Its electrical design and physical construction allow it to handle significant voltage and current spans, making it well-suited for series pass or shunt regulator configurations in demanding power conditioning circuitry.

Heater and Absolute Maximum Ratings

The 12E14 features a high-demand heater designed for reliable thermionic emission under continuous duty. The electrical limits are specified under the absolute maximum rating system, which defines the boundaries within which the device can be safely operated.

Heater Characteristics

The heater is designed for AC or DC operation, requiring a nominal voltage of 6.3 V.

Heater Parameter	Symbol	Value
Heater Voltage	Vh	6.3 V
Heater Current	Ih	1.6 A
Calculated Heater Power	Ph	10.08 W

The heater power is calculated as: $Ph = Vh * Ih = 6.3\text{ V} * 1.6\text{ A} = 10.08\text{ W}$

Absolute Maximum Ratings

To ensure device longevity and prevent catastrophic failure, the operating conditions must not exceed the following absolute maximum values:

Rating	Symbol	Value
Maximum Anode Voltage	Va(max)	800 V
Maximum Screen Voltage (Grid 2)	Vg2(max)	300 V
Maximum Control Grid Voltage (Grid 1)	Vg1(max)	-100 V
Maximum Control Grid to Screen Voltage	Vg1-g2(max)	400 V
Maximum Anode Dissipation	Pa(max)	35 W
Maximum Screen Dissipation	Pg2(max)	5 W
Maximum Cathode Current	Ik(max)	300 mA

Rating	Symbol	Value
Maximum Heater-to-Cathode Voltage (DC, heater negative)	Vh-k(max)	300 V

The ratio of maximum screen dissipation to maximum anode dissipation is calculated as: $P_{g2(max)} / P_a(max) = 5 \text{ W} / 35 \text{ W} = 14.3\%$

This ratio indicates that while the anode is capable of handling substantial thermal loads, the screen grid must be carefully protected with appropriate current-limiting resistors or voltage-stabilizing networks to avoid exceeding its 5 W limit.

Physical Dimensions and Mounting Orientation

The 12E14 is housed in a large glass envelope designed to facilitate the dissipation of heat generated by the 35 W anode and 10.08 W heater.

- **Maximum Overall Length:** 106 mm
- **Maximum Seated Height:** 93 mm
- **Maximum Diameter:** 44 mm

Mounting Constraints

The tube is designed to be mounted vertically. However, horizontal operation is permissible under strict physical alignment conditions. If the tube is run horizontally, the specific axis designated AB on the base diagram must lie on a horizontal plane. This orientation ensures that internal electrode structures, particularly the grids and the cathode, do not sag under gravity and cause internal short circuits or shifts in electrical characteristics during operation.

Base Configuration and Pin Connections

The 12E14 utilizes the **BASE-108** arrangement. The pin connections, viewed from the free end of the pins (underside of the base), are structured as follows:

Pin Number	Connection	Symbol
Pin 1	Internal Connection	IC
Pin 2	Heater	h
Pin 3	Anode	a
Pin 4	Grid 2 (Screen Grid)	<u>g2</u>
Pin 5	Grid 1 (Control Grid)	g1
Pin 6	Beam Plates	bp

Pin Number	Connection	Symbol
Pin 7	Heater	h
Pin 8	Cathode	k

Wiring and Connection Notes

- **Pin 1 (Internal Connection):** This pin is reserved for internal structural connections. It must be left entirely free of external circuit connections; it should not be used as a tie point for other components.
- **Pin 6 (Beam Plates):** The beam-forming plates must be externally connected directly to the cathode (Pin 8) to ensure proper electron beam focusing and to minimize screen grid current.
- **Base Axis AB:** The base diagram defines the axis AB at a 10-degree angle relative to the horizontal reference line passing through the center of the pin circle. This axis must be aligned horizontally if the tube is mounted in a non-vertical position.

Technical Summary

The **12E14** is a high-power, indirectly heated beam tetrode designed by AEI/Ediswan for heavy-duty voltage regulation and power supply stabilization. With a robust **6.3 V, 1.6 A** heater, the tube provides a high-emission cathode capable of delivering up to **300 mA** of continuous current. It supports anode voltages up to **800 V** and an anode dissipation of **35 W**, balanced by a screen grid rating of **300 V** and **5 W**. The device is housed in a standard envelope with a **BASE-108** octal-style configuration, requiring external connection of its beam plates to the cathode. Its mechanical design permits vertical mounting, or horizontal mounting provided the designated AB axis is aligned horizontally.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 AEI Industrial Valves

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

1961 AEI INDUSTRIAL VALVES

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum control-grid voltage	-100 V	—
Maximum control-grid-screen voltage	400 V	—
Maximum heater-cathode voltage	300 V	HeaterNegative



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Associated Electrical Industries

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1961 ASSOCIATED ELECTRICAL INDUSTRIES

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TUBE TINKER

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

