



ELECTRONIC TUBE REFERENCE

14D13

Power - Triode (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Directly heated graphite-anode radiation-cooled triode for relay and vibrator amplifiers plus low-RF and audio-frequency service, mechanically and electrically identical to V1505.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	4
NOMINAL HEATER	14 V / 7 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
PLATE RESISTANCE	2000 Ω
TRANSCONDUCTANCE	0.008 S
AMPLIFICATION FACTOR	16
MAXIMUM PLATE VOLTAGE	3000 V
MAXIMUM PLATE DISSIPATION	300 W
MAXIMUM CATHODE CURRENT	4 A

14D13 — Radiation Cooled Power Triode

A directly heated, radiation-cooled power triode designed for high-power low-frequency and radio-frequency applications, including relay and vibrator amplifiers.

Overview

The **14D13** is a heavy-duty, directly heated radiation-cooled triode manufactured by Associated Electrical Industries Limited (AEI) under the Ediswan brand. It is mechanically and electrically identical to the **V1505** triode. Featuring a robust graphite anode and a thoriated tungsten filament, the 14D13 is designed primarily for demanding industrial and communications applications. Its specified services include relay and vibrator amplifiers, as well as other low-frequency audio-frequency (A.F.) and radio-frequency (R.F.) applications.

Mechanical Construction, Mounting, and Physical Dimensions

The physical design of the 14D13 is optimized for high-power dissipation through radiation cooling. The tube incorporates a graphite anode, which provides excellent thermal stability and heat dissipation under continuous load conditions. The filament is a thoriated tungsten type, offering high electron emission efficiency.

Due to its high operating temperatures and physical size, the 14D13 must be mounted in a **vertical, base down** position to ensure proper heat convection and mechanical stability. The tube uses a **Special 4-pin** base configuration.

The physical dimensions of the envelope are substantial:

- **Maximum Overall Length:** 345 mm
- **Maximum Seated Height:** 322 mm
- **Maximum Diameter:** 90 mm

Electrical Ratings and Filament Characteristics

The 14D13 operates with a high-current filament supply and is rated under the absolute value system. The filament is designed to run from either AC or DC sources.

Filament and Absolute Maximum Ratings

Parameter	Symbol	Value
Filament Voltage	Vf	14 ± 5% V
Filament Current	If	7.0 A
Maximum Anode Voltage (D.C.)	Va(max)	3.0 kV
Maximum Peak Cathode Current	ik(pk)max	4.0 A
Maximum Anode Dissipation (continuous)	Pa(max)	300 W

Parameter	Symbol	Value
Maximum Operating Frequency (at full ratings)	f(max)	1.5 Mc/s

Inter-Electrode Capacitances

The internal capacitances of the triode structure determine its performance at higher frequencies and influence the design of neutralizing circuits in R.F. applications:

- **Anode to Grid (Ca-g):** 18 pF
- **Grid to Filament (Cg-f):** 14 pF
- **Anode to Filament (Ca-f):** 9.0 pF

Typical Characteristics and Class AB2 Push-Pull Operation

Static Characteristics

Under typical static operating conditions, the 14D13 exhibits a moderate amplification factor combined with a relatively low plate resistance, enabling efficient power transfer. At a specified operating point, the static characteristics are as follows:

- **Anode Voltage (Va):** 2.0 kV
- **Anode Current (Ia):** 150 mA
- **Mutual Conductance (gm):** 8.0 mA/V
- **Amplification Factor (μ):** 16
- **Valve Anode Resistance (ra):** 2.0 kΩ

Class AB2 Push-Pull Audio-Frequency Amplifier

The 14D13 is highly suited for high-power Class [AB2](#) push-pull audio amplification. Typical operating parameters for a two-valve push-pull configuration are documented below. Unless otherwise specified, the voltage and current values represent the requirements or performance of a single valve in the pair:

Parameter	Symbol	Value
Anode Voltage (d.c., no signal)	Va	2.68* kV
Anode Voltage (d.c., maximum signal)	Va	2.5 kV
Grid Voltage (d.c., approximate)	Vg	-160 V
Grid Voltage (r.m.s., A.F. Sine Wave)	Vg(r.m.s.)	180 V

Parameter	Symbol	Value
Anode Current (d.c., no signal)	Ia	100 mA
Anode Current (d.c., maximum signal)	Ia	350 mA
Grid Current (d.c., maximum signal, approx.)	Ig	25 mA
Grid Current (peak, approx.)	ig(pk)	400 mA
Driving Power (maximum signal, approx.)	Pd	6.0 W
Maximum Anode Dissipation	Pa(max)	300 W
Anode-to-Anode Load (two valves)	RL(a-a)	10 kΩ
Power Output (maximum signal, two valves)	Pout	>1.2 kW
Total Distortion (at maximum signal, two valves)	D	<5 %

***Note: The no-signal anode voltage of 2.68 kV is based on a high-tension (h.t.) supply regulation of 10%.**

In this Class [AB2](#) configuration, the two-valve stage is capable of delivering an output power in excess of 1.2 kW with less than 5% total harmonic distortion. This high power output requires a driving power of approximately 6.0 W at maximum signal, reflecting the grid current flow during positive grid excursions (with peak grid current reaching approximately 400 mA).

Technical Summary

The **14D13** is a high-power, directly heated, radiation-cooled triode featuring a graphite anode and a thoriated tungsten filament. It is mechanically and electrically identical to the [V1505](#). Operating with a nominal 14 V, 7.0 A filament supply, the tube is rated for a maximum continuous anode dissipation of 300 W and a maximum D.C. anode voltage of 3.0 kV. It is designed for vertical, base-down mounting using a special 4-pin base.

With an amplification factor of 16 and a mutual conductance of 8.0 mA/V, the 14D13 is optimized for heavy-duty applications such as relay and vibrator amplifiers, as well as low-frequency and R.F. services up to 1.5 Mc/s. In Class [AB2](#) push-pull service, a pair of 14D13 valves can deliver more than 1.2 kW of audio power with less than 5% distortion, making it an exceptionally powerful and robust choice for high-power modulator and amplifier designs.



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 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum operating frequency	15 MHz	—
Power output	1.2 kW	ClassAB;PushPull;TwoTubes

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode-grid capacitance	18 pF	—
Grid-filament capacitance	14 pF	—
Anode-filament capacitance	9 pF	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Associated Electrical Industries

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

1961 ASSOCIATED ELECTRICAL INDUSTRIES

Section 1 · Triode

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PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum operating frequency	15 MHz	—
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CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode-grid capacitance	18 pF	—
Grid-filament capacitance	14 pF	—
Anode-filament capacitance	9 pF	—

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