



ELECTRONIC TUBE REFERENCE

11A1

Voltage - Triode (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Ediswan/Mazda indirectly heated triode for general electronic amplification. Available source material does not establish a narrower functional application confidently.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	9
NOMINAL HEATER	6.3 V / 950 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
PLATE RESISTANCE	375 Ω
TRANSCONDUCTANCE	0.012 S
AMPLIFICATION FACTOR	4.5
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	15 W
MAXIMUM CATHODE CURRENT	120 mA

11A1 — Low-Mu Triode Series Stabiliser Valve

The **11A1** is an indirectly heated, miniature-based low-mu triode designed specifically for use as a series stabiliser (regulator) valve. Characterised by high mutual conductance, low anode impedance, and a robust cathode design, the 11A1 is capable of handling significant current and power dissipation in voltage regulation circuitry. It is suitable for parallel operation to achieve higher output current capacities.

Construction, Physical Dimensions, and Heater

The 11A1 is constructed in a miniature glass envelope with a standard Noval (B9A) base. Its physical dimensions are compact, allowing for efficient space utilisation in electronic equipment.

Physical Parameter	Value
Maximum Overall Length	65 mm
Maximum Seated Height	58 mm
Maximum Diameter	22 mm
Approximate Nett Weight	1/2 oz
Approximate Packed Weight	3/4 oz

The valve features an indirectly heated, coated cathode. The heater is designed for standard parallel or series supply systems, operating at a nominal voltage of 6.3 V.

- **Heater Voltage (V_h):** 6.3 V
- **Heater Current (I_h):** 0.95 A
- **Calculated Heater Power:** 5.985 W (calculated as $6.3\text{ V} \times 0.95\text{ A}$)

The mounting position of the 11A1 is completely unrestricted, allowing for flexible physical orientation within a chassis.

Base Configuration and Pin Connections

The 11A1 uses a 9-pin **Noval (B9A)** base. The pin connections, viewed from the free end of the pins (underside of the base), are assigned as follows:

Pin Number	Connection	Abbreviation
1	Internal Connection	IC
2	Cathode	k
3	Internal Connection	IC
4	Heater	h
5	Heater	h
6	Grid	g
7	Internal Connection	IC
8	Internal Connection	IC
9	Anode	a

Note: Pins designated as Internal Connection (IC) must not be used for external circuit tie points, as they are connected to internal structures of the valve.

Electrical Characteristics and Maximum Ratings

The electrical design of the 11A1 prioritises low internal resistance and high transconductance to ensure effective voltage regulation. The typical electrical characteristics, measured under specific operating conditions, are detailed below.

Measured Characteristics

At an anode voltage (V_a) of 150 V and an anode current (I_a) of 100 mA, the typical parameters are:

- **Mutual Conductance (g_m):** 12 mA/V
- **Amplification Factor (μ):** 4.5
- **Anode Impedance (r_a):** 375 Ω

The low anode impedance of 375 Ω is a key parameter for series regulator service, minimising the voltage drop across the valve and improving the efficiency of the regulator circuit.

Absolute Maximum Ratings

To ensure reliable operation and prevent premature failure, the following maximum ratings must not be exceeded:

Parameter	Symbol	Maximum Rating
Maximum Anode Voltage	$V_{a(max)}$	300 V
Maximum Anode Dissipation	$P_{a(max)}$	15 W
Maximum Cathode Current	$I_{k(max)}$	120 mA
Maximum Heater-to-Cathode Voltage	$V_{h-k(max)}$	250 V

Inter-Electrode Capacitances

The inter-electrode capacitances are measured without an external shield:

- **Anode to Grid (C_{a-g}):** 9.0 pF
- **Anode to Cathode (C_{a-k}):** 4.5 pF
- **Grid to Cathode (C_{g-k}):** 8.5 pF

Typical Operation in Series Regulator Service

The primary application of the 11A1 is as a series regulator in power supply stabilisation circuits. Because a single valve has a maximum cathode current rating of 120 mA, multiple valves are frequently operated in parallel to support higher load currents.

A typical operating configuration using **two 11A1 valves in parallel** provides the following performance:

- **Input Voltage (V_{in}):** 360 V
- **Output Voltage (V_{out}):** 210 V
- **Total Output Current ($I_{out(tot)}$):** 200 mA
- **Stabilisation for $\pm 7\%$ Input Variation:** 0.2%

Balancing Requirements

When operating 11A1 valves in parallel, minor variations in individual valve characteristics can lead to unequal current sharing. To ensure equal distribution of the load and prevent any single valve from exceeding its maximum cathode current or anode dissipation limits, small resistors should be inserted in the anode and cathode leads of each valve for balancing purposes.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1960 Mazda

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

1960 MAZDA

Section 1 · Triode

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum heater-cathode voltage	250 V	—



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 heater-cathode voltage	250 V	—
Typical regulator input voltage	360 V	SeriesRegulator;TwoTubes
Typical regulator output voltage	210 V	SeriesRegulator;TwoTubes
Typical regulator output current	200 mA	SeriesRegulator;TwoTubes

CAPACITANCE

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode-grid capacitance	9 pF	—
Anode-cathode capacitance	4.5 pF	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-cathode capacitance	8.5 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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum heater-cathode voltage	250 V	—
Typical regulator input voltage	360 V	SeriesRegulator;TwoTubes
Typical regulator output voltage	210 V	SeriesRegulator;TwoTubes
Typical regulator output current	200 mA	SeriesRegulator;TwoTubes

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode-grid capacitance	9 pF	—
Anode-cathode capacitance	4.5 pF	—
Grid-cathode capacitance	8.5 pF	—