



ELECTRONIC TUBE REFERENCE

1878

Rectifier - Half Wave electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Indirectly heated high-voltage half-wave rectifier for very-low-current power supplies. Its design emphasizes multi-kilovolt operation and insulation rather than substantial DC current.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	4 V / 700 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
NOMINAL OUTPUT CURRENT	2 mA
Indirectly heated very-high-voltage half-wave rectifier.	

1878 — High-Vacuum High-Voltage Half-Wave Rectifier

A high-vacuum, half-wave rectifying valve designed for high-voltage, low-current applications, featuring an indirectly heated cathode, an Edison screw base, and a top-cap anode connection.

Overview

The **1878** is a specialized high-vacuum half-wave rectifier valve (also described in French documentation as a *tube redresseur monoplaque à vide poussé pour haute tension*). It is engineered specifically to handle very high alternating input voltages while delivering small direct currents. The tube is constructed with a glass envelope, a top-cap anode terminal for high-voltage isolation, and a standard Edison screw base. It operates with a nominal 4.0 V AC heater supply.

The primary application of the 1878 is high-voltage rectification in circuits requiring up to 2 mA of output current, such as electrostatic equipment, early television or cathode-ray tube power supplies, and other specialized high-voltage apparatus.

Mechanical Construction and Base Connections

The physical layout of the 1878 is designed to prevent electrical breakdown and flashover under high-voltage stress. By placing the anode connection at the top of the bulb, the high-voltage terminal is physically isolated from the low-voltage heater and cathode connections at the base.

Physical Dimensions

- **Maximum overall length:** 154 mm
- **Maximum bulb diameter:** 53 mm

Base and Pinout Configuration

The tube features a metal Edison screw base with a nominal diameter of 26 mm. The electrical connections are distributed as follows:

- **Top Cap:** Anode (a)
- **Base Center Contact:** Heater (f or h)
- **Base Threaded Shell:** Common heater-cathode (f, k or h, k)

This configuration utilizes the threaded metal shell of the Edison base as the common return path for both the cathode and one side of the heater, while the center contact provides the remaining heater connection.

Heater and Electrical Ratings

The 1878 is equipped with an indirectly heated cathode designed for operation from an alternating current (A.C.) supply. The heater and maximum operating limits are defined as follows:

Heater Ratings

- **Heater Voltage (V_f):** 4.0 V
- **Heater Current (I_f):** 0.7 A
- **Calculated Heater Power:** 2.8 W (calculated as $4.0\text{ V} \times 0.7\text{ A}$)

Limiting Values (Grenzdaten)

To ensure safe operation and prevent internal damage, the operating conditions must not exceed the following maximum ratings:

- **Maximum Transformer Voltage (V_{tr}):** 10,500 V_{eff} (RMS)
- **Maximum Output Current (I_o or I_a max):** 2 mA (average)

These ratings indicate that the 1878 is intended for low-current, high-voltage power supplies, where a high RMS input voltage is rectified to produce a low-current DC output.

Anode Characteristics and Forward Conduction

While the 1878 is rated to withstand high inverse voltages, its forward conduction characteristics at lower voltages are documented to illustrate its internal resistance and voltage drop. The relationship between the anode voltage (V_a) and the resulting anode current (I_a) is characterized by the following typical values:

Anode Voltage (V_a)	Typical Anode Current (I_a)
100 V	0.5 mA to 0.8 mA
200 V	1.8 mA to 2.0 mA
300 V	3.5 mA to 3.6 mA
350 V to 370 V	4.7 mA to 4.8 mA

At anode voltages above 300 V, the characteristic curves transition into a dashed representation in some documentation, indicating regions that may represent transient states or operation up to approximately 400 V. These values show that the tube exhibits a relatively high internal voltage drop, which is typical for high-vacuum rectifiers designed for high-voltage, low-current service.

Technical Summary

The **1878** is a specialized high-vacuum, half-wave rectifier valve designed for high-voltage, low-current applications. It features a 4.0 V, 0.7 A indirectly heated cathode, an Edison screw base (26 mm), and a top-cap anode connection to ensure high-voltage isolation. With a maximum transformer input rating of 10,500 V_{eff} (RMS) and a maximum average output current of 2 mA, the 1878 is optimized for electrostatic and high-voltage power supply circuits. Its physical dimensions include a maximum overall length of 154 mm and a maximum bulb diameter of 53 mm.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1957 Philips Receiving and Amplifying Tubes

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

1957 PHILIPS RECEIVING AND AMPLIFYING TUBES

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
RMS Transformer Voltage Maximum	10500 V	—
DC Output Current Maximum	2 mA	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Mullard

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

1963 MULLARD

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	10500 V	—
Output/anode current maximum	2 mA	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	High-voltage rectification	—



1963 Philips Electron Tubes Handbook V1

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

1963 PHILIPS ELECTRON TUBES HANDBOOK V1

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum AC no-load voltage per plate	10500 V	HalfWave
Maximum DC output current	2 mA	HalfWave

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