

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

1037

1 SECTION
CONSTRUCTION
RECTIFIER

Rectifier - Half Wave electronic tube

Directly heated Philips mercury-vapour or gas-filled industrial rectifier for battery charging. Rated for approximately 185 V peak inverse voltage, 3 A average current, and 18 A peak current.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	1.9 V / 11 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Rectifier	
PEAK INVERSE VOLTAGE	185 V
NOMINAL OUTPUT CURRENT	3 A
PEAK FORWARD CURRENT	18 A
FORWARD VOLTAGE DROP	9 V
WARM-UP TIME	120 s
Directly heated gas-filled rectifier with mercury-vapour/gas filling for battery charging up to 20 lead-acid cells.	

1037 — Double-Anode Mercury-Vapour and Gas-Filled Rectifying Valve

The 1037 is an industrial double-anode rectifying valve designed for high-efficiency power rectification. Utilizing a combination of mercury vapour and gas filling, this valve is engineered to deliver high currents with a low internal voltage drop. Its primary application is in heavy-duty battery charging systems.

Technical Specifications and Filament Heating

The 1037 features a directly heated, oxide-coated filament designed to operate from an alternating current (A.C.) supply. Because the valve contains mercury vapour, specific preheating protocols must be strictly followed to ensure the mercury is fully vaporized before anode voltage is applied. This prevents damage to the cathode coating from ion bombardment.

Parameter	Value
Filament Voltage (V_f)	1.9 V
Filament Current (I_f)	11 A
Calculated Filament Power	20.9 W
Recommended Preheating Time (T_w)	2 minutes
Minimum Preheating Time (Urgent)	1 minute
Preheating Time after Transport or Long Interruption	5 minutes

For automated system integration, a time delay switch (such as type [4152](#)) can be utilized to enforce the necessary preheating period. Following transport or any prolonged period of non-operation, the preheating time must be extended to 5 minutes to ensure proper mercury distribution within the envelope.

Mechanical Construction and Mounting

The physical design of the 1037 is optimized for high-current industrial service, featuring robust external connections and a specialized base to handle high filament currents.

- **Base Type:** Goliath base.
- **Associated Socket:** Type 65909 BG/01.
- **Mounting Position:** Vertical, base down only.
- **Anode Connections:** Two separate anodes (a and a') terminate in M4 screw connectors on the side of the glass envelope, positioned at a 60° angle relative to each other.
- **Physical Dimensions:**
 - Maximum overall height: 240 mm
 - Seated bulb height (above base): 193 mm
 - Maximum bulb diameter: 85 mm
 - Maximum base diameter: 50 mm
- **Weight:** Net weight of the valve is 290 g. For shipping, a standard package of 6 valves has a gross weight of 3600 g.

Electrical Characteristics and Operating Limits

The electrical performance of the 1037 is characterized by a low internal voltage drop (arc voltage) once ignition occurs, which is typical of mercury-vapour and gas-filled rectifiers.

Typical Characteristics

- **Arc Voltage (V_{arc}):** 9 V
- **Ignition Voltage (V_{ign}):** 16 V

Limiting Values (Absolute Maxima)

To ensure reliable operation and prevent arc-back or cathode degradation, the circuit parameters must be kept within the following limits:

- **Transformer Voltage (V_{tr}):** Maximum 60 V_{eff} , Minimum 15 V_{eff}
- **Anode Inverse Peak Voltage (V_{ainvp}):** Maximum 185 V
- **Anode Current (I_a):** Maximum 3 A
- **Anode Peak Current (I_{ap}):** Maximum 18 A
- **Series Resistance (R_t):** Minimum $1.75\ \Omega$
- **Operating Temperature Range (t_{Hg}):** 30°C to 80°C (condensed mercury temperature)

The minimum series resistance (R_t) of $1.75\ \Omega$ is a critical safety parameter required to limit peak inrush currents and protect the cathode from degradation during start-up or transient conditions.

Applications and Circuit Integration

The primary application of the 1037 is in industrial battery chargers. A single valve is rated to deliver a charging current of up to **6 A** and can support charging configurations of up to **20 lead-acid (Pb) cells** connected in series.

In practical installations, the double-anode configuration allows for full-wave rectification using a single valve. The circuit must be designed to maintain the condensed mercury temperature (t_{Hg}) within the specified 30°C to 80°C range, as temperatures outside this window can lead to either failure to ignite (too cold) or premature arc-back (too hot).



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Philips Electron Tubes Handbook V3

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

1963 PHILIPS ELECTRON TUBES HANDBOOK V3

Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Arc voltage drop	9 V	GasFilled

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum peak inverse anode voltage	185 V	—
Maximum average anode current	3 A	—
Maximum peak anode current	18 A	—
Application	battery charging up to 20 lead-acid cells	—
Heater voltage	1.9 V	DirectAC
Heater current	11 A	DirectAC



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1999 Philips 0-D

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

1999 PHILIPS 0-D

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MinimumSeriesResistance	1.75 ohm	—

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
TypicalArcVoltage	9 V	—
IgnitionVoltage	16 V	—

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