



ELECTRONIC TUBE REFERENCE

17RK19

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Half-wave vacuum rectifier designed as a damper tube in television horizontal-deflection circuits, with ratings tailored to line-scan pulse operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	9
NOMINAL HEATER	16.8 V / 450 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
MAXIMUM PLATE DISSIPATION	6.5 W
PEAK INVERSE VOLTAGE	5500 V
NOMINAL OUTPUT CURRENT	200 mA
PEAK FORWARD CURRENT	1.2 A
FORWARD VOLTAGE DROP	19 V
WARM-UP TIME	11 s

Damper-service ratings; output-current field uses published average plate current.

17RK19 — Half-Wave Vacuum Rectifier

The **17RK19** (also designated as the **17BR3/17RK19**) is a miniature half-wave vacuum rectifier designed primarily for use as a damper tube in the horizontal-deflection circuits of television receivers. It is characterized by high peak inverse voltage capabilities and a high peak current rating, making it suitable for the demanding pulse conditions of television scanning systems.

Overview and Equivalents

The 17RK19 is a specialized half-wave rectifier tube constructed in a miniature glass envelope. It is electrically identical to the [6BR3/6RK19](#) except for its heater ratings, which are tailored for series-string heater chains or specific power supply configurations.

Its primary application is damper service in television receivers operating under standard 525-line, 30-frame scanning systems. In this role, the tube must withstand high-voltage pulses during horizontal retrace while conducting significant peak currents to recover energy from the deflection yoke.

Construction, Heater, and Physical Characteristics

The 17RK19 is a miniature-type tube requiring a standard miniature 9-contact socket. The physical construction features a top-cap connection for the cathode, which helps isolate the high-voltage pulse electrode from the heater and plate connections on the base, minimizing the risk of internal arcing.

The heater is designed with controlled warm-up characteristics to ensure reliable operation in series-connected heater strings.

Heater Parameter	Value
Heater Voltage (AC/DC)	16.8 V
Heater Current	0.45 A
Heater Warm-up Time	11 seconds

The tube envelope corresponds to outline section 7D. Under maximum operating conditions, the bulb temperature at its hottest point must not exceed **180 °C**.

Pinout and Socket Connections

The 17RK19 utilizes the **9CB** pinout diagram. The base connections, viewed from the bottom of the 9-contact miniature socket, are arranged as follows:

Pin Number	Connection
Pin 1	Internal Connection (IC)
Pin 2	Internal Connection (IC)
Pin 3	Internal Connection (IC)
Pin 4	Heater (H)
Pin 5	Heater (H)
Pin 6	Internal Connection (IC)
Pin 7	Internal Connection (IC)

Pin Number	Connection
Pin 8	Internal Connection (IC)
Pin 9	Plate (P)
Top Cap	Cathode (K)

Pins designated as Internal Connection (IC) must not be used for circuit tie points, as they may be connected to internal elements or support structures. The cathode is brought out exclusively to the top cap to provide adequate insulation for the high peak voltages encountered during damper service.

Damper Service Ratings and Electrical Characteristics

The ratings for the 17RK19 are established under the Design-Maximum system for operation in a standard 525-line, 30-frame television system. These ratings represent the absolute limits within which the tube can safely operate.

Design-Maximum Ratings

- **Peak Inverse Plate Voltage:** 5500 V (provided the pulse duration does not exceed 15% of a horizontal scanning cycle, or a maximum of 10 μ s)
- **Peak Plate Current:** 1200 mA
- **Average Plate Current:** 200 mA
- **Plate Dissipation:** 6.5 W
- **Maximum Bulb Temperature (Hottest Point):** 180 °C

Heater-Cathode Voltage Ratings

Because the damper tube cathode is subjected to high pulse voltages relative to ground, the heater-to-cathode insulation is highly stressed. The maximum ratings are:

- **Heater Positive (with respect to cathode):**
 - Peak value: +300 V
 - Average value: +100 V
- **Heater Negative (with respect to cathode):**
 - Peak value: -5500 V
 - Average value: -900 V

Typical Electrical Characteristics

Under typical operating conditions, the tube exhibits a low internal voltage drop to maximize efficiency in energy recovery. The instantaneous tube voltage drop is:

- **Tube Voltage Drop:** 19 V (measured at an instantaneous plate current of 250 mA)

This low voltage drop minimizes internal plate dissipation and ensures that a high proportion of the deflection energy is returned to the circuit.

Technical Summary

The **17RK19** (or **17BR3/17RK19**) is a high-voltage, miniature half-wave vacuum rectifier designed specifically for television damper service. Featuring a 16.8 V, 0.45 A heater with an 11-second warm-up time, it is identical to the [6BR3/6RK19](#) except for these heater specifications. Its physical design utilizes a 9-contact miniature base with a top-cap cathode connection to handle peak inverse voltages up to 5500 V and peak currents up to 1200 mA. With a low typical voltage drop of 19 V at 250 mA, the 17RK19 provides efficient energy recovery and reliable operation in horizontal-deflection systems.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1975 RCA RC30

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

1975 RCA RC30

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak Inverse Plate Voltage	5500 V	DamperService
Peak Plate Current	1200 mA	DamperService
Average Plate Current	200 mA	DamperService

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tube Voltage Drop	19 V	PlateCurrent=250mA

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