



ELECTRONIC TUBE REFERENCE

16AFP1

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Cathode-ray display tube with approximately 65-degree deflection, typically operated from a 12 kV anode supply with a 250 V second-grid supply and adjustable focus voltage.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12L	BASE PINS	12
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	16000 V
MAXIMUM SCREEN VOLTAGE	410 V
MAXIMUM HEATER-CATHODE VOLTAGE	125 V
<i>Published applicable promoted ratings populated; remaining device-specific values retained as parameters.</i>	

16AFP1 — Electrostatic-Focus Electromagnetic-Deflection Cathode Ray Tube

An electrostatic-focus, electromagnetic-deflection cathode ray tube featuring a zero-focus electron gun, a metal-backed screen, and a 16-inch diagonal rectangular envelope.

Overview

The **16AFP1** is a high-definition, high-intensity cathode ray tube designed for applications requiring electromagnetic deflection and electrostatic focus. Developed by Vacuum Tube Products, this tube features a specialized zero-focus type electron gun that provides substantially automatic focus, which remains independent of variations in the accelerator voltage. The 16AFP1 designation represents the 16AF tube configuration utilizing a P1 phosphor screen.

Screen and Construction

The 16AFP1 features a metal-backed screen designed to deliver optimal performance and high image intensity when viewing is required under high ambient light levels. This metallic coating also provides protection against ion burns, ensuring screen longevity. Long operating life is further supported by an exclusive long and careful exhaust method during production.

While the underlying 16AF design is available with a wide range of phosphors (including P1, P2, P3, P4, P5, P11, P12, P15, P16, P18, P19, and P20), the 16AFP1 is specifically configured with the P1 phosphor. Mechanically, the tube does not regularly employ internal pole pieces.

Mechanical Specifications and Basing

The tube utilizes a Small Shell Duodecal 7-pin base under the RTMA 12L basing standard. The anode connection is made via a small recessed cavity located in the bulb wall.

Physical Dimensions

- **Overall Width:** 14.750 inches
- **Overall Height:** 11.250 inches (11-1/4")
- **Screen Width:** 13.500 inches (13-1/2")
- **Screen Height:** 10.125 inches (10-1/8")
- **Maximum Diagonal Diameter:** 16.125 inches (16-1/4")
- **Useful Screen Diagonal:** 15.0 inches
- **Neck Length:** 5.250 inches (5-1/4") minimum
- **Length from Face to Reference Line:** 9.146 inches
- **Length from Reference Line to Base:** 8.079 inches
- **Deflection Angle:** Approximately 65 degrees (with specific nominal angles of 70 degrees diagonally and 50.8 degrees vertically)

Pinout Configuration (RTMA 12L)

Pin Number	Element	Function
1	H	Heater
2	G#1	Grid #1 (Control Electrode)

Pin Number	Element	Function
6	Focus	Electrostatic Focus Electrode
7	NC	No Connection
10	G#2	Grid #2 (Accelerating Electrode)
11	K	Cathode
12	H	Heater
Recessed Cavity	Anode	Conductive Inner Wall Coating and Grid #3

Electrical Ratings and Characteristics

The 16AFP1 operates with an indirectly heated cathode. The maximum ratings (D.C. values unless specified otherwise) are established to prevent damage and ensure reliable operation:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Amperes
- **Anode Voltage (Conductive Inner Wall Coating and G#3):** 16,000 Volts D.C. Maximum
- **Grid #2 Voltage (Accelerating Electrode):** 410 Volts D.C. Maximum
- **Grid #1 Voltage (Control Electrode):**
 - *Negative Bias Value:* 125 Volts D.C. Maximum
 - *Positive Bias Value:* 0 Volts D.C. Maximum
 - *Positive Peak Value:* 2 Volts D.C. Maximum
- **Peak Heater-to-Cathode Voltage:**
 - *Heater Negative with respect to Cathode:* 125 Volts D.C. Maximum
 - *Heater Positive with respect to Cathode:* 125 Volts D.C. Maximum
- **Focus Voltage Range:** Plus or minus 500 Volts Maximum

Typical Operation and Circuit Design

Under typical operating conditions, the 16AFP1 is configured with the following parameters:

- **Heater Voltage:** 6.3 Volts
- **Anode Voltage:** 12,000 Volts D.C.
- **Grid #2 Voltage:** 250 Volts D.C.
- **Grid #1 Voltage:** -27 to -63 Volts D.C.
- **Focus Voltage:** Zero (due to the automatic focus characteristics of the zero-focus gun design)

Because the tube operates from power supplies that are dangerous, specific circuit resistance limits are recommended as a safety measure to protect both the operator and the device:

- **Grid #1 Circuit Resistance:** 150 Ohms Minimum to 1.5 Megohms Maximum
- **Grid #2 Circuit Resistance:** 470 Ohms Minimum
- **Anode Circuit Resistance:** 15,000 Ohms Minimum



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1955 Vacuum Tube Products

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

1955 VACUUM TUBE PRODUCTS

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Anode Voltage	12000 V	—
Typical Grid 2 Voltage	250 V	—
Grid 1 Voltage Range	-63--27 V	—
Focus Voltage Range	-500-500 V	—
Grid 1 Circuit Resistance Maximum	1.5 Mohm	—
Grid 2 Circuit Resistance Minimum	470 ohm	—
Anode Circuit Resistance Minimum	15000 ohm	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection Angle	65 degree	—

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker