27EP4
CATHODE-RAY TUBE

27-INCH RECTANGULAR, GLASS
FOCUS—MAGNETIC
DEFLECTION—MAGNETIC
90-DEGREE DEFLECTION ANGLE

24- BY 18½-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
ION-TRAP GUN
ALUMINIZED SCREEN

DESCRIPTION AND RATING

The 27EP4 is a magnetic-focus and deflection, direct-view all-glass picture tube which provides a 24- by 18½-inch picture for television applications. The electron gun is designed for use with an external single-field ion-trap magnet. Other features of this tube include a high-quality gray faceplate which increases picture contrast and detail under high-ambient-light conditions, a reflective aluminized screen to increase light output, and a space-saving rectangular face shape.

GENERAL

ELECTRICAL

Heater Voltage ......................................................... 6.3 Volts
Heater Current ....................................................... 0.6 ± 10% Amperes

Focusing Method—Magnetic
Deflecting Method—Magnetic
Deflection Angle, approximate
   Diagonal ................................................................ 90 Degrees
   Horizontal .............................................................. 85 Degrees
   Vertical ................................................................. 70 Degrees

Direct Interelectrode Capacitances, approximate
   Cathode to All Other Electrodes ................................ 5 \( \mu \mu F \)
   Grid-No. 1 to All Other Electrodes ............................. 6 \( \mu \mu F \)

OPTICAL

Phosphor Number—P4, Sulfide Type
   Fluorescent Color—White
   Phosphorescent Color—White
   Persistence—Short

Faceplate—Gray
   Light Transmission at Center, approximate .................. 68 Percent
MECHANICAL

Over-all Length .......................................................... 23 1/16 ± 3/8 Inches
Greatest Bulb Dimensions
  Diagonal ........................................................... 26 1/8 ± 1/6 Inches
  Width ......................................................... 25 9/32 ± 1/6 Inches
  Height ............................................... 20 3/32 ± 1/6 Inches

Minimum Useful Screen Dimensions
  Diagonal .................................................... 25 3/8 Inches
  Width ................................................... 24 Inches
  Height ............................................... 18 1/2 Inches
  Neck Length ........................................ 0.75 Inches

Bulb Number, ASA Designation—J214-1/2-A1
Bulb Contact—Recessed Small-cavity Cap, JETEC No. J1-21
Base—Small-shell Duodecal 5-Pin, JETEC No. B5-57
Basing, JETEC Designation—12D
Bulb Contact Alignment
  Anode Contact Aligns with Pin No. 6 Position ± 30 Degrees

Mounting Position—Any
Net Weight, approximate ........................................... 44 Pounds

MAXIMUM RATINGS

DESIGN-CENTER VALUES*

Anode Voltage† .............................................................. 20,000 Max Volts DC
Grid-No. 2 Voltage .......................................................... .500 Max Volts DC
Grid-No. 1 Voltage
  Negative-Bias Value .................................................. 125 Max Volts DC
  Positive-Bias Value .................................................. 0 Max Volts DC
  Positive-Peak Value ............................................... .2 Max Volts

Peak Heater-Cathode Voltage‡
  Heater Negative with Respect to Cathode
    During Warm-up Period not to Exceed 15 Seconds .................. .410 Max Volts
    After Equipment Warm-up Period ...................................... .180 Max Volts
  Heater Positive with Respect to Cathode ............................... .180 Max Volts

TYPICAL OPERATING CONDITIONS

Anode Voltage§ .......................................................... 16,000 Volts DC
Grid-No. 2 Voltage .......................................................... .300 Volts DC
Grid-No. 1 Voltage  ................................................... −28 to −72 Volts DC
Focusing-Coil Current ▲, approximate ..................................... 116 Milliamperes DC
Ion-Tap Field Intensity △, approximate .................................... 40 Gausses

MAXIMUM CIRCUIT VALUES

Grid-No. 1 Circuit Resistance ......................................... 1.5 Max Megohms

*The maximum ratings provide a ten-percent safety factor in accordance with the standard design-center system of rating cathode-ray tubes. The tube will withstand the combined effects of variations in line voltages and components provided the maximum design-center values are not exceeded by more than ten percent.
† Anode and grid-No. 3 which are connected together within the tube are referred to herein as anode.
If this tube is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert possible danger of personal injury from prolonged exposure at close range. The protective face-viewing window of apparatus using tubes of this type may provide such a safeguard. If the radiation measured in contact with this window does not exceed 6.25 milliroentgens per hour, the window will normally provide adequate protection.
‡ Cathode should be returned to one side or to the midtap of the heater transformer winding.
§ Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 14,000 volts.
π For visual extinction of focused raster.
▲ For JETEC focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3 3/4 inches.
▼ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through JETEC ion-trap magnet No. 117.

SCREEN DIMENSIONS:
DIAGONAL 25-3/4''
WIDTH 24''
HEIGHT 18-1/2''

NOTES:
1. REFERENCE LINE IS DETERMINED BY THE PLANE OF THE UPPER EDGE OF THE SHOULDER OF THE REFERENCE-LINE GAGE (RETMA NO. 119) WHEN THE GAGE IS RESTING ON THE CONE.
2. DEFLECTION ANGLE ON DIAGONAL IS 90 DEGREES.
3. ANODE TERMINAL ALIGNS WITH PIN-NO. 6 Position ± 30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET.
5. RECOMMENDED POSITION FOR CENTER OF FOCUSING FIELD.