

PL-8576/ PL-264

Beam Pentode



DESCRIPTION

The Penta PL-8576/PL-264 is a ceramic beam pentode having an exceptionally low input capacitance for its power-handling capability. The tube is especially suited for use in broad-band linear amplifiers, but will also provide outstanding performance in other Class-AB₁ amplifier applications.

ELECTRICAL CHARACTERISTICS

Cathode — Coated Unipotential	
Heater Voltage	6.0 volts
Heater Current	17 amperes
Minimum Cathode Heating Time	5 minutes
Transconductance (1500 v. Eb, 750 v. Ec ₂ , 2 a. Ib)	37,000 μ mhos
Interelectrode Capacitances	
Grounded-Cathode Circuit Configuration	
Grid-Plate	0.14 μ fd
Input	54 μ fd
Output	31 μ fd
Grounded-Cathode Circuit Configuration, Tube in PL-265A Socket	
Grid-Plate	0.16 μ fd
Input	57 μ fd
Output	33 μ fd

MECHANICAL CHARACTERISTICS

Base	Special 7-pin
Base Connections	See Base Diagram
Recommended Socket	PL-265A
Maximum Overall Dimensions	
Length	5.7 inches
Diameter	4.4 inches
Net Weight	4.8 pounds

Cooling*

Plate Dissipation (Watts)	Air Flow (c.f.m.)	Pressure Drop (Inches of Water)
2000	67	0.43
3000	108	0.95

*At sea level, 50° C. maximum incoming air temperature. Pressure drop includes drop across PL-265A socket.

Mounting Position	Axis vertical, base up or down
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Form 92C-341A

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PENTA LABORATORIES, INC.

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MOUNTING

The PL-8576/PL-264 may be mounted in any position. When the tube is mounted with the axis vertical, it should be supported by either the lower edge or the upper flat portion of the suppressor-grid terminal ring, or by the anode cooler. When mounted with the axis horizontal, the tube should be supported by the anode cooler.

Contact to the suppressor and screen-grid contact surfaces should be made by spring contact material in at least three places around the periphery of each surface.

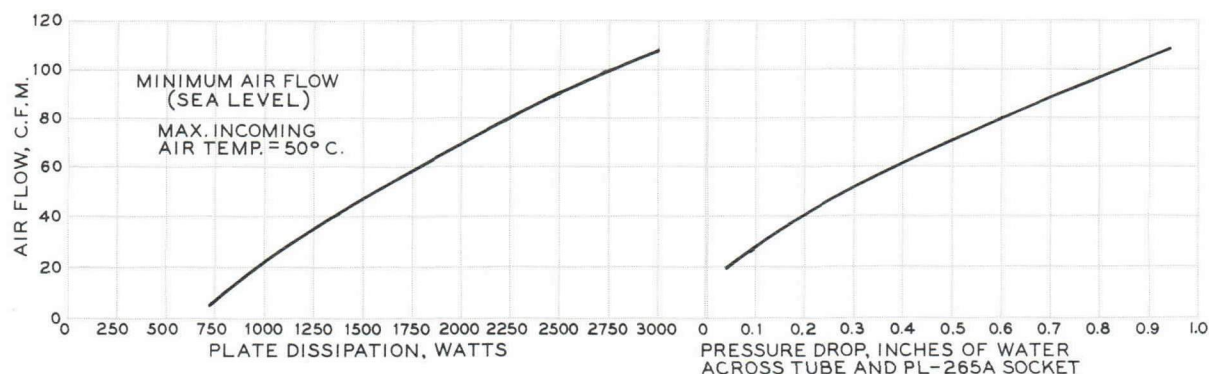
The base of the tube fits a standard giant seven-pin ceramic socket, such as the E. F. Johnson Co. No. 122-237. The socket should be so located that the ceramic at the tube base does not contact the socket when the tube is seated in its support.

The PL-265A, a special socket having air-directing provisions and contacts for all base pins and suppressor and screen-grid terminals, is available. The PL-265A socket has built-in screen-grid by-pass capacitors, and the suppressor-grid contacts are grounded to the socket frame.

COOLING

Cooling air requirements for the PL-8576/PL-264 when used with the PL-265A socket, are shown in the graph below. Any additional pressure drops in the air system between the blower and socket, such as might occur in an air duct, must be added to the pressure drop figure taken from the chart to determine the static pressure which must be maintained at the blower.

Sufficient cooling air should be diverted over the base end of the tube from the anode cooling supply, either before or after entering the anode cooler, to limit the temperature of the base seals and screen-grid and suppressor-grid contact surfaces to a maximum of 250° C.



MAXIMUM RATINGS

CCS (Continuous Commercial Service)

D-C Plate Voltage	-	-	-	-	-	-	-	-	-	-	5000 volts
D-C Screen-Grid Voltage	-	-	-	-	-	-	-	-	-	-	750 volts
D-C Suppressor-Grid Voltage	-	-	-	-	-	-	-	-	-	-	100 volts
D-C Control-Grid Voltage	-	-	-	-	-	-	-	-	-	-	-250 volts
D-C Plate Current	-	-	-	-	-	-	-	-	-	-	2.0 amperes
Screen-Grid Input	-	-	-	-	-	-	-	-	-	-	50 watts
Plate Dissipation	-	-	-	-	-	-	-	-	-	-	3000 watts

OPERATION — GENERAL

Heater voltage for the tube should be maintained as closely as possible to the rated value of 6.0 volts. Variations in heater voltage of up to 10 per cent are permissible, but decreased tube life and variations in power output may occur with prolonged operation at voltages of more than five per cent from the rated value.

Permanent damage to the tube can be caused by screen-grid input in excess of the maximum rating. If screen voltage is obtained from a power supply separate from the plate voltage supply, the circuit should be so arranged that it is impossible to apply screen voltage without plate voltage. The use of a screen-grid over-current relay is recommended, to remove screen voltage immediately in case of excessive screen current due to circuit maladjustment, grid bias failure, or accidental removal of plate circuit loading.

Grid-bias voltage must be obtained from a fixed bias supply in Class-AB₁ or AB₂ applications. The internal resistance of the bias source should not exceed 2500 ohms.

RADIO-FREQUENCY OPERATION

In low distortion Class-AB₁ linear amplifier service, where reaction on the driver circuit must be entirely eliminated, it will usually be found advisable to neutralize the small feedback capacitance of the PL-8576/PL-264.

A metal chassis or equivalent means should be provided to separate the input and output circuits of an amplifier using the PL-8576/PL-264. Reasonable precautions should be observed in regard to by-passing and shielding of the supply leads to prevent coupling between input and output through external circuits.

For Class-AB₁ linear amplifier service, the screen voltage for the tube must be obtained from a well-regulated source, to prevent excessive screen voltage variations due to changes in screen current which occur between zero-signal and full-signal conditions.



TYPICAL OPERATION — Class AB₁ Linear R-F Amplifier
Single-Sideband, Suppressed Carrier; Grounded-Cathode Circuit

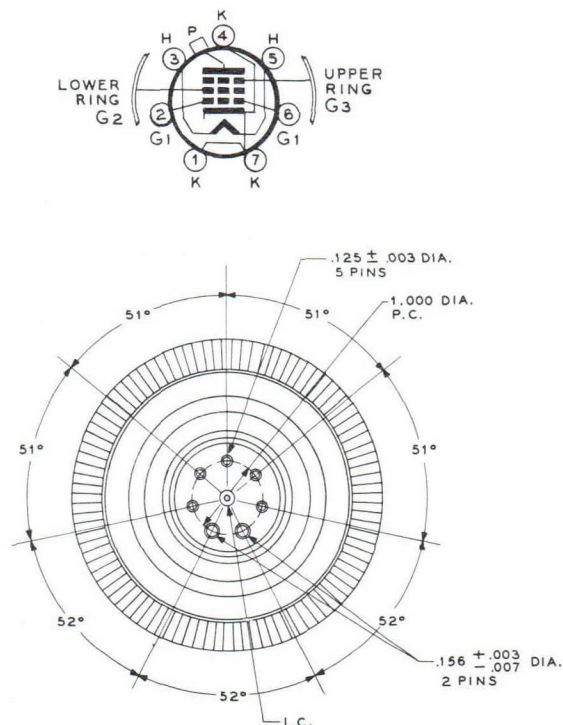
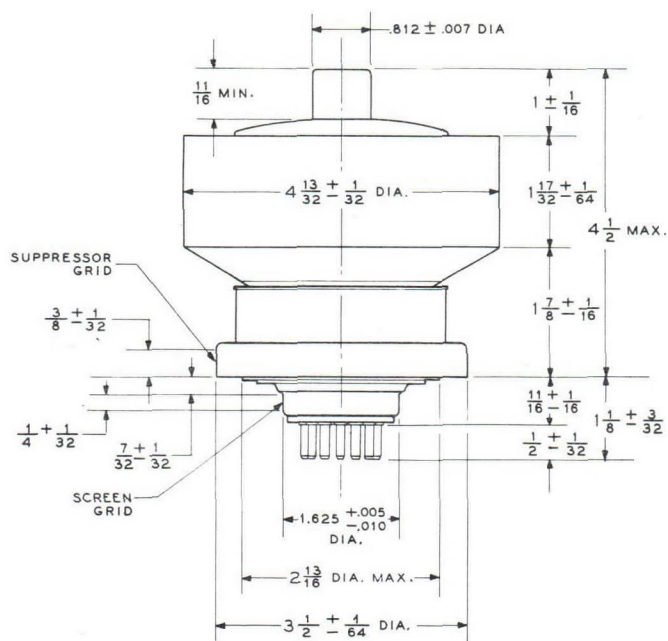
D-C Plate Voltage	3000	4000	4000	5000	5000	volts
D-C Screen-Grid Voltage	750	650	750	650	750	volts
D-C Suppressor-Grid Voltage	0	0	0	0	0	
D-C Control-Grid Voltage ¹	-105	-88	-107	-92	-110	volts
Zero-Signal D-C Plate Current	400	400	400	400	400	ma.
Maximum-Signal D-C Plate Current, Single Tone	*	1.21	*	1.33	*	amperes
Maximum-Signal D-C Plate Current, Two Tone	1.03	0.87	1.04	0.90	1.06	amperes
Zero-Signal D-C Screen-Grid Current	16	10	13	8	11	ma.
Maximum-Signal D-C Screen-Grid Current, Single Tone	*	75	*	70	*	ma.
Maximum-Signal D-C Screen-Grid Current, Two Tone	57	38	45	33	36	ma.
Maximum-Signal Peak R-F Control-Grid Voltage	105	88	107	92	110	volts
Intermodulation Distortion Level ²						
Third Order Products	-29	-33	-29	-30	-29	db
Maximum-Signal Useful Power Output ³	2950	2900	4050	4100	5400	watts

*Single-tone operation not permissible under conditions shown because screen-grid input exceeds maximum rating.

¹Approximate value; adjust to give stated zero-signal plate current.

²At maximum output. Referenced against one tone of two equal-tone signal. No degenerative feedback. Fifth and higher-order distortion products more than 45 db below one tone.

³Single-tone or peak envelope power delivered to load from typical amplifier.





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