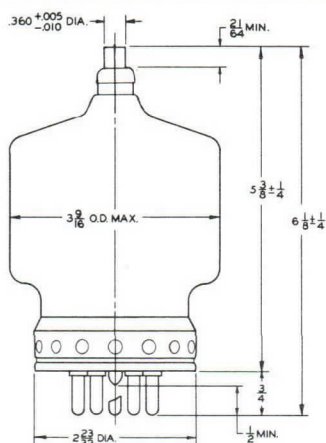


PL-6775

Power Tetrode



The PL-6775 is a ruggedized version of the 4-400A power tetrode, for which it can be used as a replacement without circuit modification. The tube may be operated in any position, and will withstand high levels of shock and vibration. The PL-6775 features a one-piece, low-loss plate cap and seal which will not loosen or easily break off.

The maximum plate dissipation rating of the PL-6775 is 400 watts. It is cooled by radiation from the plate and by forced air through the base, along the envelope, and over the plate seal. A large effective plate radiating area is provided through use of the unique Penta ribbed-plate construction.

ELECTRICAL CHARACTERISTICS

Filament -- Thoriated Tungsten	
Voltage (± 5 per cent) - - - - -	5.0 volts
Current - - - - -	14.5 amperes
Grid-Screen mu factor - - - - -	5.1
Transconductance (2500 v. Eb, 500 v. Ec ₂ , 100 ma. Ib) - - - - -	4000 μ mhos
Interelectrode Capacitances	
Grid-Plate - - - - -	0.12 μ mf.
Input - - - - -	12.5 μ mf.
Output - - - - -	4.5 μ mf.
Maximum Frequency for Full Ratings - - - - -	110 Mc.

MECHANICAL CHARACTERISTICS

Base ¹ - - - - -	EIA A5-97
Basing - - - - -	EIA Type 5BK
Maximum Overall Dimensions	
Length - - - - -	6.38 inches
Diameter - - - - -	3.56 inches
Mounting Position - - - - -	Any
Net Weight - - - - -	9.0 ounces

¹ Recommended Socket -- Johnson 122-275, operated in conjunction with the PL-C1 glass chimney with socket cut-out as shown on page 3.



PENTA LABORATORIES, INC.

312 NORTH NOPAL STREET • SANTA BARBARA, CALIFORNIA



PL-6775

COOLING

A total quantity of 15 cubic feet per minute of cooling air, properly distributed to the base, envelope, and plate seal area, is required for all classes of operation when the PL-6775 is operated at or near the maximum plate dissipation rating. The required cooling air is most conveniently provided by means of a pressurized chassis upon which a standard tube socket is mounted in a special cut-out, as shown on page three, in conjunction with a Penta PL-C1 air-control glass chimney. Alternatively, a commercial air-distribution type socket may be used with the PL-6775.

When used with the socket cut-out shown on page three, and with the PL-C1 chimney, the PL-6775 will be adequately cooled for operation at maximum ratings when the pressure within the sealed chassis is equal to 0.4 inch of water, at which pressure the required 15 cfm air flow will be obtained. A small centrifugal blower rated at about 100 cfm of free air will provide the proper pressure and quantity of cooling air. Cooling is adequate when the base seal temperatures do not exceed 200° C and the plate seal temperature does not exceed 225° C.

In applications where the plate dissipation does not exceed 250 watts, and where operation is below 30 Mc., the PL-6775 may be operated without forced envelope or plate seal cooling but with an air flow of five cubic feet per minute through the base alone.

RADIO-FREQUENCY OPERATION

The PL-6775 is especially suited for use as a radio-frequency power amplifier. The compact construction and low interelectrode capacitances permit operation at full ratings at frequencies as high as 110 Mc. Neutralization is not normally required at frequencies below 30 Mc. At frequencies above 45 to 50 Mc. the feedback within the tube is substantially the result of screen-lead inductance. The effect of screen-lead inductance may be eliminated for a specified frequency of operation through the use of a variable

capacitor as the screen-lead by-pass. The capacitor is tuned for minimum feedback of energy from the plate circuit back to the grid circuit. A variable capacitor with a maximum capacitance of 50 $\mu\mu\text{fd}$ normally will be found adequate for operation in the 100 Mc. region.

An unusually small amount of driving power is required by the PL-6775 under normal operating conditions. The high power sensitivity of the tube permits a reduction in the power requirements imposed on the preceding driver stage, but requires that adequate precautions be taken to minimize the feedback of energy from the output circuit back to the input circuit of the tube.

AUDIO-FREQUENCY OPERATION

The high power sensitivity of the PL-6775 makes it well suited for use as an audio-frequency power amplifier or modulator in push-pull Class AB₁ or Class AB₂ service. In these classes of operation a pair of PL-6775s can give relatively high audio-frequency power output with low driving power and low harmonic distortion.

GRID-VOLTAGE REGULATION

When the PL-6775 is used as a Class AB₁ or AB₂ amplifier, screen voltage should be obtained from a well-regulated source. If a separate screen-grid power supply is used, the supply should be shunted by a resistance of 25,000 ohms or less, to prevent screen-voltage "runaway" in case of negative screen-grid current. This limitation regarding maximum screen-to-ground resistance applies to either unregulated supplies or supplies containing a series-tube regulator, since the latter may be ineffective when the net current flowing in the supply circuit becomes negative.

In Class AB₂ operation, the control-grid bias source should have good regulation, to prevent bias variations during periods of grid-current flow. Bias regulation is not of significant importance under Class AB₁ operating conditions, but grid-circuit resistance should not exceed 250,000 ohms per tube.

MAXIMUM RATINGS—CCS (Continuous Commercial Service)

(Frequencies below 110 Mc.)

	Class C FM or C.W.	Plate Mod. Class C	Class AB ₁ Audio Ampl.	Class AB ₂ Audio Ampl.
DC Plate Voltage	4000	3200	4000	4000 volts
D-C Screen Voltage	600	600	800	800 volts
D-C Grid Bias	—500	—500		volts
D-C Plate Current	350	275	350	350 ma.
Plate Dissipation	400	270	400	400 watts
Screen Dissipation	35	35	35	35 watts
Grid Dissipation	10	10	10	10 watts



PL-6775

TYPICAL OPERATION—Class C CW or FM Amplifier (Frequencies below 75 Mc.)

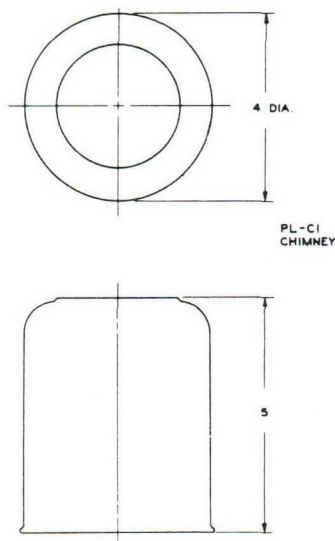
D-C Plate Voltage	2500	3000	4000	volts
D-C Screen Voltage	500	500	500	volts
D-C Grid Voltage	-200	-220	-220	volts
D-C Plate Current	350	350	350	ma.
D-C Screen Current	46	46	42	ma.
D-C Grid Current	18	18	19	ma.
Plate Dissipation	235	250	300	watts
Screen Dissipation	23	23	21	watts
Grid Dissipation	1.8	1.8	1.8	watts
Peak R-F Grid Voltage (approx.)	300	320	320	volts
Driving Power (at 20 Mc.)	5.5	5.9	6.0	watts
Plate Power Input	875	1050	1400	watts
Plate Power Output	640	800	1100	watts

Note: Driving power increases with operating frequency until at 75 Mc. approximately twice as much driving power as shown above will be required.

TYPICAL OPERATION—Class C. Amplitude- Modulated Amplifier, Carrier Conditions

D-C Plate Voltage	2000	2500	3000	volts
D-C Screen Voltage	500	500	500	volts
D-C Grid Voltage	-220	-220	-220	volts
D-C Plate Current	275	275	275	ma.
D-C Screen Current	30	28	26	ma.
D-C Grid Current	12	12	12	ma.
Plate Dissipation	170	180	195	watts
Screen Dissipation	15	14	13	watts
Grid Dissipation	1.1	1.1	1.1	watts
Peak A-F Screen Voltage	350	350	350	volts
Peak R-F Grid Voltage (approx.)	290	290	290	volts
Driving Power (approx.)	3.5	3.5	3.5	watts
Plate Power Input	550	688	825	watts
Plate Power Output	380	508	630	watts

(Frequencies below 75 Mc.)



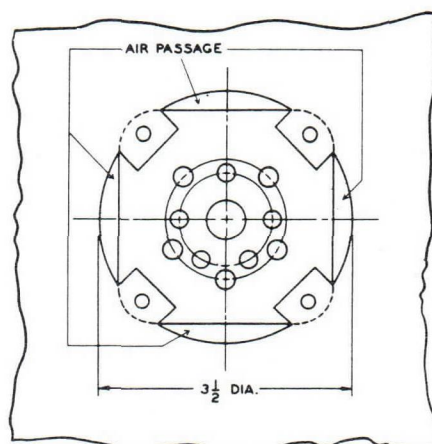
TYPICAL OPERATION—Class AB₁ A-F Power Amplifier or Modulator (Sine wave, two tubes)

D-C Plate Voltage	2500	3000	4000	volts
D-C Screen Voltage	750	750	750	volts
D-C Grid Voltage*	-130	-140	-150	volts
Zero Signal D-C Plate Current	190	160	120	ma.
Max.-Signal D-C Plate Current	635	610	585	ma.
Zero-Signal D-C Screen Current	0	0	0	ma.
Max.-Signal D-C Screen Current	28	30	40	ma.
Plate-to-Plate Load Resistance	6800	9000	14,500	ohms
Peak A-F Grid-to-Grid Signal	255	275	295	volts
Driving Power	0	0	0	watts
Max-Signal Plate Dissipation (per tube)	370	400	400	watts
Max.-Signal Plate Power Output	850	1100	1550	watts

TYPICAL OPERATION—Class AB₂ A-F Power Amplifier or Modulator (Sine wave, two tubes)

D-C Plate Voltage	2500	3000	4000	volts
D-C Screen Voltage	500	500	500	volts
D-C Grid Voltage*	-75	-80	-90	volts
Zero-Signal D-C Plate Current	190	160	120	ma.
Max.-Signal D-C Plate Current	700	700	640	ma.
Zero-Signal D-C Screen Current	0	0	0	ma.
Plate-to-Plate Load Resistance	7200	9000	14,000	ohms
Peak A-F Grid-to-Grid Signal	265	280	280	volts
Average Driving Power (Max. signal)	4.3	4.5	3.5	watts
Peak Driving Power (Max. signal)	9	10	8	watts
Max-Signal Plate Dissipation (per tube)	320	400	400	watts
Max-Signal Plate Power Output	1100	1380	1750	watts

*Note: Approximate values. Adjust to give the stated value of zero-signal plate current.



CHASSIS CUT-OUT AND SOCKET MOUNTING FOR
PROPER AIR DISTRIBUTION FROM PRESSURIZED CHASSIS
(JOHNSON NO. 122-275 SOCKET)



PL-6775

