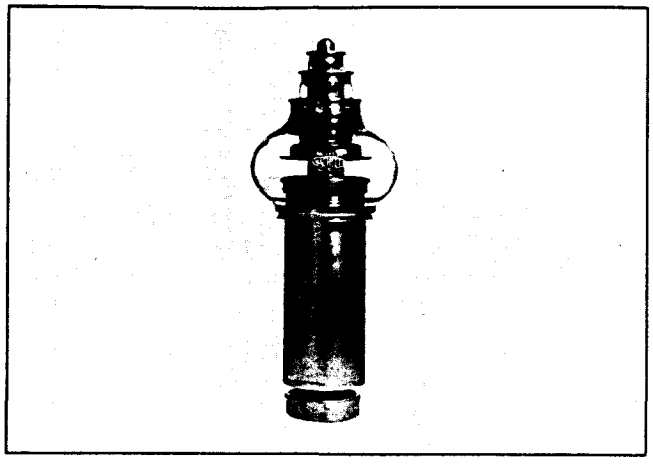
MACHLETT

PRODUCT DATA

ML-LPT 50



APPLICATION

The ML-LPT 50 is a high voltage, high mu triode designed primarily to operate as a switch tube in hard-tube pulse modulators for radar and similar applications. In this service it can deliver pulse output in the order of 10 Mw, depending on circuitry and performance requirements.

The ML-LPT 50 is designed for operation in oil or equivalent dielectric fluid, which is required for utilization of the maximum plate voltage ratings. For applications with a resistive load and low energy storage, the tube is rated at 125 kVdc plate voltage. Where the tube is to be used in series with the rf load tube, where high stored energy is involved, or where the frequency of kick-outs must be extremely low, the dc plate voltage should be limited to 100 kV.

CONSTRUCTION

The cathode of this tube consists of stress-free, carburized thoriated tungsten filaments. The control grid includes encapsulated zirconium getter bands for improved high voltage stability. The anode is capable of dissipating 10 kW when cooled by forced oil.

WARNING

When operating at peak voltage in excess of 15 kV, this electron tube may give off x-rays which can be harmful unless adequately shielded by the enclosure within which the tube is used. Instructions for protective installation are given in National Bureau of Standards Handbook 93, "Safety Standard for Non-Medical X-Ray and Sealed Gamma Ray Sources." Additional information is available in National Council on Radiation Protection and Measurements Report No. 33, "Medical X-Ray and Gamma Ray Protection for Energies up to 10 MeV." Periodic checks of shielding effectiveness are also required since x-ray radiation levels may increase with the operating life of the tube.

ORDERING NOTES

Refer to **Machlett** price list. When ordering specify

- tube type
- accessories - small filament connector F-17488
  large filament connector F-17489
  grid connector F-17397
  oil jacket assembly F-543919

SPECIFICATION

ELECTRICAL CHARACTERISTICS

Filament Voltage:	13.0 volts
Filament Current:	205 amps
Filament Starting Current, maximum:	800 amps
Filament Cold Resistance:	0.0075 ohm
Amplification Factor:	135
Interelectrode Capacitances:	
Grid-Plate:	25 pf
Grid-Filament:	80 pf
Plate-Filament:	0.7 pf

MECHANICAL CHARACTERISTICS

Mounting Position:	Vertical, anode down
Insulating Medium:	Oil or equivalent
Type of Cooling:	Forced oil
Oil Flow for 10 kW Plate Dissipation:	30 gal/min (114 l/min.) †
Maximum Bulk Oil Temperature:	75 °C (167 °F)
Maximum Circulating Oil Temp. for Maximum Dissipation:	75 °C (167 °F)
Maximum Glass Temperature:	165 °C (329 °F)
Net Weight, approximate:	35 lbs. (15.9 kg)

†When using Machlett oil jacket part number F-543919 (order separately)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Pulse Modulator or Pulse Amplifier

Maximum Ratings

DC Plate Voltage	125	kV‡
Peak Plate Voltage	125	kv‡
DC Grid Voltage	−1500	V
Peak Negative Grid Voltage	−6000	v
Pulse Cathode Current	175	a
Grid Dissipation	1000	W
Plate Dissipation	10	kW‡‡
Pulse Duration	1000	μs#
Duty Factor	.01	#

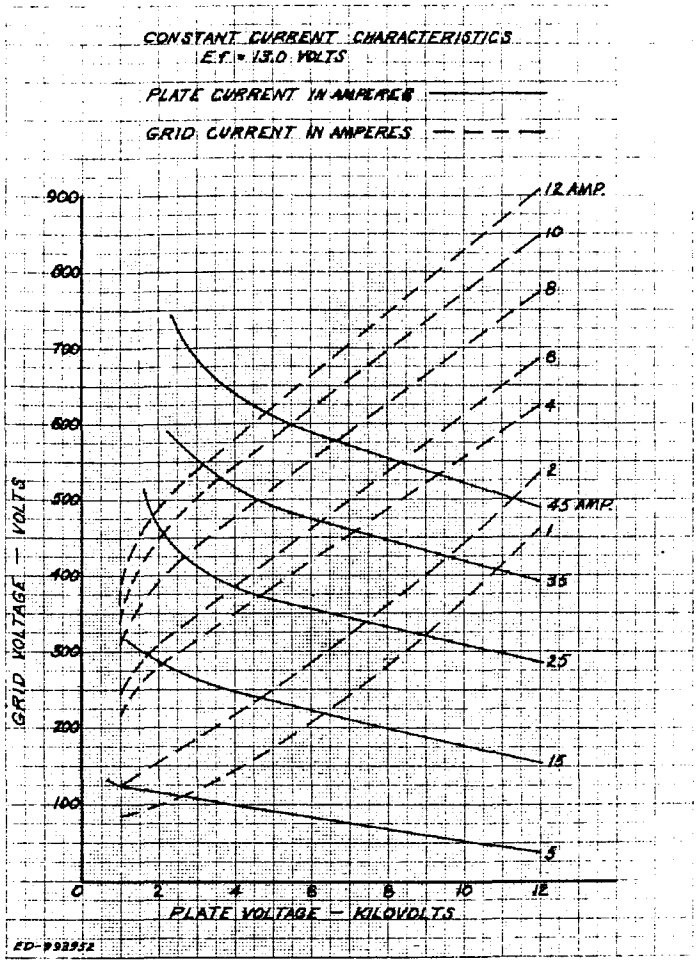
Typical Operation

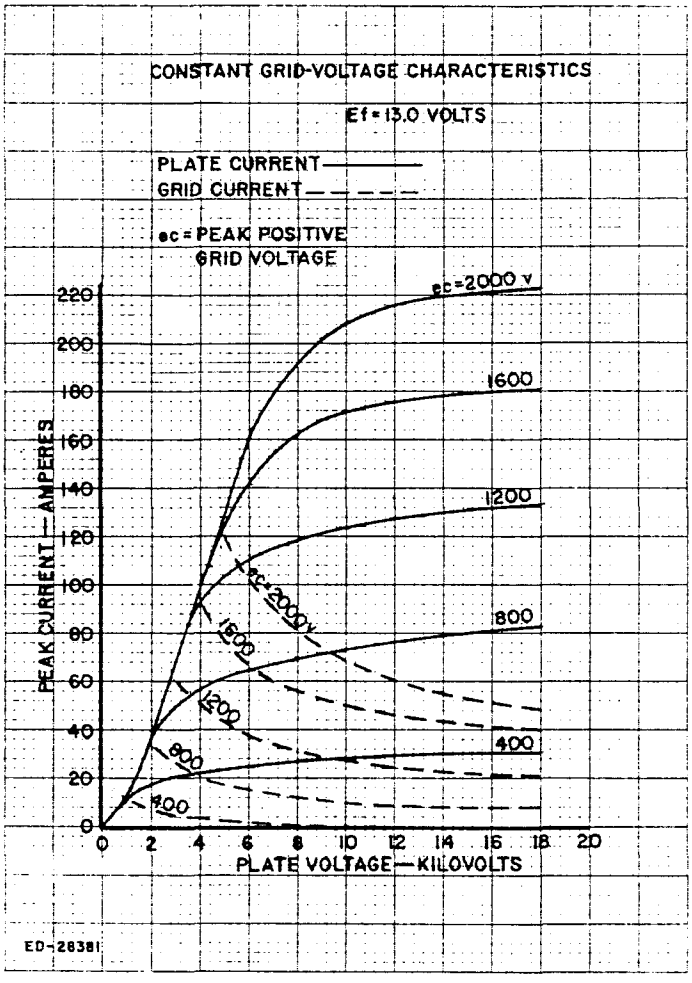
DC Plate Voltage	110	kV
DC Grid Voltage	−1000	V
Pulse Positive Grid Voltage	1000	v
Pulse Plate Current	100	a
Pulse Grid Current	20	a
Pulse Driving Power	40	kw
Pulse Power Output	10	Mw
Pulsed Plate Output Voltage	100	kv
Duty Factor	.001	

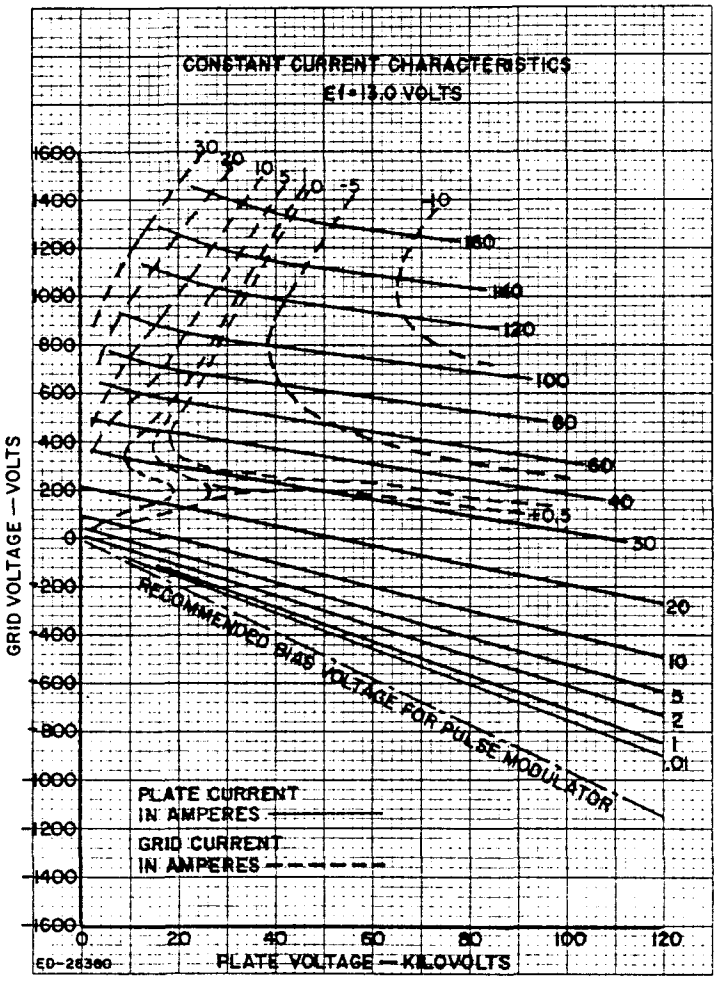
‡ This voltage may be applied only when the tube is immersed in a suitable dielectric fluid.

‡‡ With tube immersed in oil and cooled by 30 gal/min (114 l/min.) oil flow in ML oil jacket F-543919

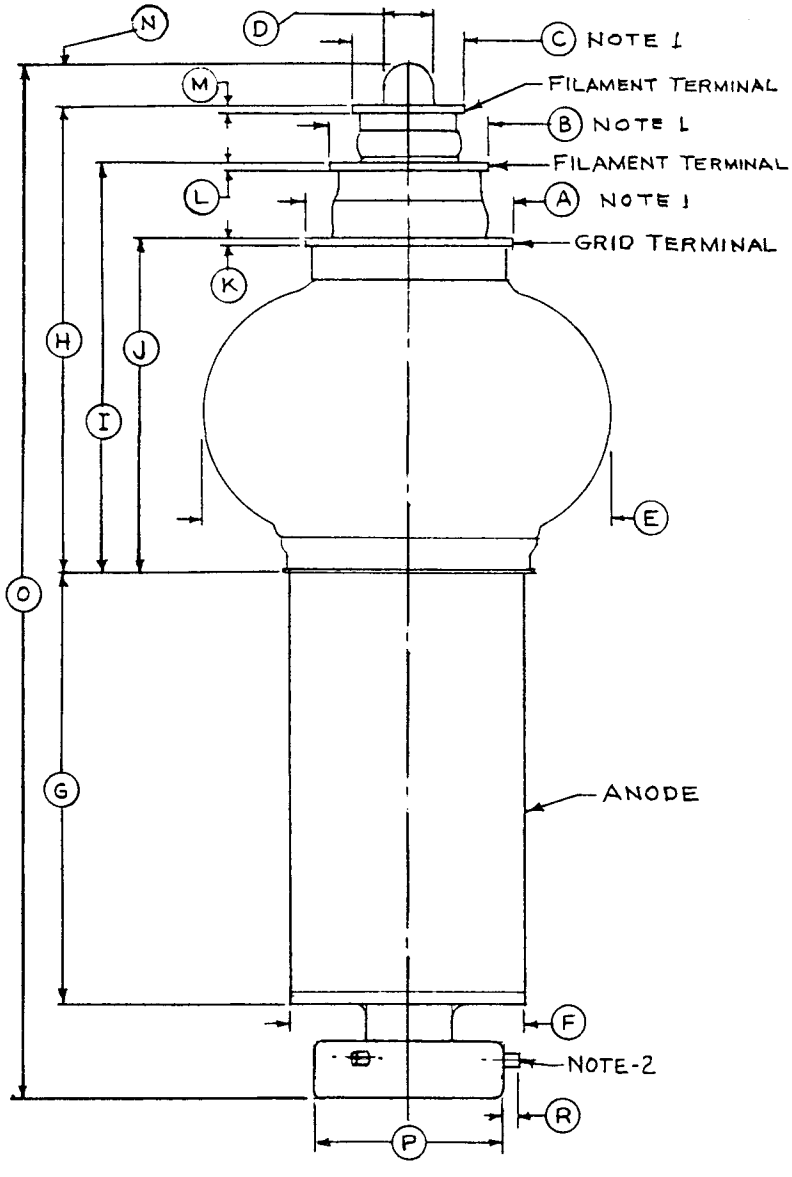
For applications requiring longer pulse duration or higher duty factors, consult the Machlett Engineering Department.







OUTLINE DATA



DIMENSIONS FOR OUTLINE OF ML-LPT 50

Ref	Inches (mm) Minimum		Nominal		Maximum		Notes
A	4.60	(116.8)	4.63	(117.6)	4.66	(118.4)	1
B	3.48	(88.4)	3.51	(89.2)	3.54	(89.9)	1
C	2.48	(63.0)	2.51	(63.8)	2.54	(64.5)	1
D	—		1.13	(28.7)	1.19	(30.2)	
E	8.81	(223.8)	9.00	(228.6)	9.25	(235.0)	
F	5.09	(129.3)	5.12	(130.0)	5.15	(130.8)	
G	9.91	(251.5)	10.04	(255.0)	10.17	(258.3)	
H	10.25	(260.4)	10.45	(265.4)	10.65	(270.5)	
I	9.08	(230.6)	9.20	(233.7)	9.32	(236.7)	
J	7.39	(187.7)	7.45	(189.2)	7.51	(190.8)	
K	.16	(4.1)	.19	(4.8)	.22	(5.6)	
L	.16	(4.1)	.19	(4.8)	.22	(5.6)	
M	.16	(4.1)	.19	(4.8)	.22	(5.6)	
N	—		.94	(23.9)	1.00	(25.4)	
O	—		—		23.5	(597.0)	
P	4.486	(113.9)	4.496	(114.2)	4.506	(114.5)	
R	.29	(7.4)	.31	(7.9)	.33	(8.4)	2

NOTES: 1. Allow ± .01" for out of roundness to min. and max.
2. Bayonet pins 120° apart for oil jacket connections.

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Specifications subject to change without notice