

ML-7334

ML-7335

Shielded Grid Triodes
High Duty
150 kw Pulse Power



DESCRIPTION

The ML-7334 and ML-7335 are shielded-grid triodes designed primarily to operate as switch tubes in hard-tube pulse modulators, for radar and similar applications.

The ML-7334 is designed specifically for high-duty-factor, long-pulse operation where it is capable of 150 kilowatts pulse output power. Either type may be used in this service, or in low-duty, short-pulse applications where it is capable of switching 750 kW.

Each of these types has sturdy electrodes arranged to form a cylindrical array of electron-optical systems, featuring a shield electrode connected internally to the cathode

by direct, low-impedance paths. This design permits operation with low grid current and it results in favorably low grid-plate capacitance. The presence of the ground-potential shield adjacent to the anode, furthermore, protects the cathode and grid from damage by transient arcs.

The cathode of each type is unipotential oxide-coated. The anode of the ML-7334 is designed for cooling by a forced flow of water, oil, or other suitable liquid. The cooling jacket is clamped onto the anode so that tubes may be installed and removed without breaking into the cooling system.† The ML-7335 anode is forced-air cooled and is capable of dissipating 3 kW with an air flow of 280 cfm.

Note: Data contained herein are based on initial design and test criteria. Before using these data in final equipment designs, consult Machlett for possible revisions.

GENERAL CHARACTERISTICS

Electrical

Heater Voltage	6.0±5%	Volts
Heater Current	60	Amps
Heater Starting Current, maximum	300	Amps
Cathode Warmup Time	10	Minutes*
Amplification Factor	125	
Interelectrode Capacitances		
Grid-Plate	5	μf
Grid-Cathode	250	μf
Plate-Cathode	50	μf

Mechanical

Mounting Position (support tube by anode or anode radiator only)	Any
Type of Cooling—ML-7334	Forced-liquid†
Type of Cooling—ML-7335	Forced-air‡
Air flow on anode, minimum for 3 kW dissipation	280 cfm at 3" water
Air flow on grid	50 cfm
Maximum incoming air temperature	65 °C
Maximum Ceramic Temperature	225 °C‡
Net Weight, approximate	
ML-7334	9 lbs.
ML-7335	12 lbs.

†For details on cooling requirements for ML-7334, consult the Machlett Engineering Department.

*For accelerated cathode warmup, the filament may be energized at 7.0 volts for 5 minutes and then reduced to 6.0 volts for high-voltage operation. If a filament standby voltage of 5.0 volts is used, the minimum cathode warmup time is 1 minute at 6.0 volts.

‡Sufficient coolant flow must be provided to maintain envelope temperatures at less than 225°C under all conditions of operation.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS
 VALUES APPLY TO BOTH TYPES
Pulse Modulator or Pulse Amplifier

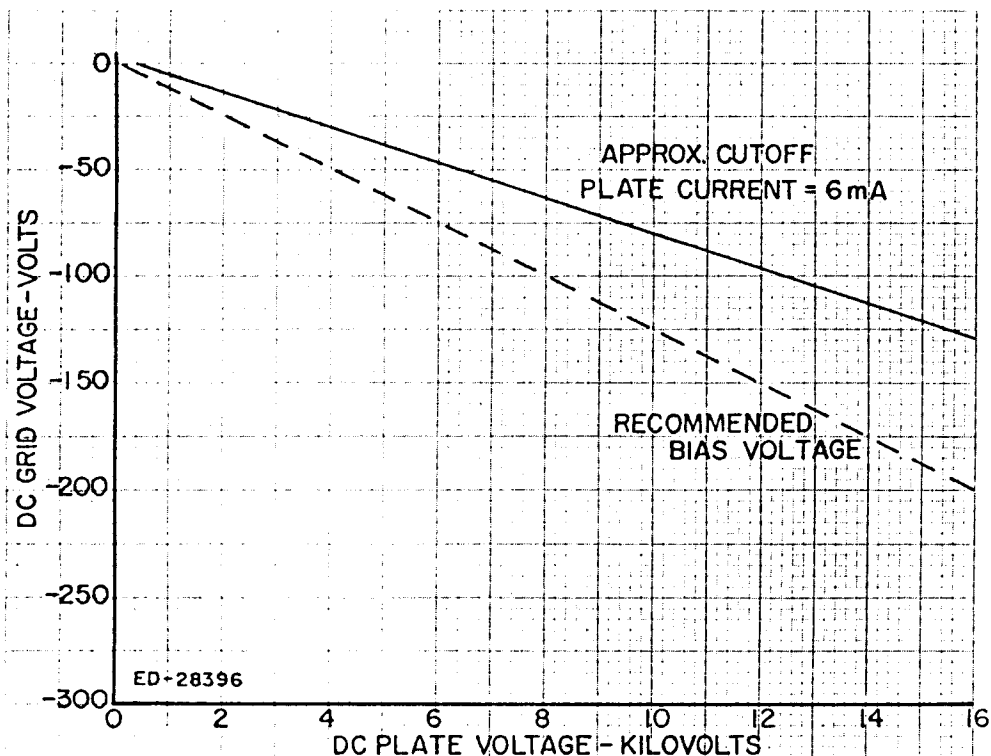
Maximum Ratings, Absolute Values

D-C Plate Voltage	16	kV
Peak Plate Voltage	20	kv
D-C Grid Voltage	-300	volts
Peak Positive Grid Voltage	1000	volts
Peak Negative Grid Voltage	-1000	volts
Pulse Cathode Current	15	75 amp
D-C Plate Current	3500	200 mA
Grid Dissipation	75	75 watts
Plate Dissipation		
ML-7334	5	5 kW
ML-7335	3	3 kW
Pulse Duration	500	25 μ sec
Duty Factor	0.35	0.003

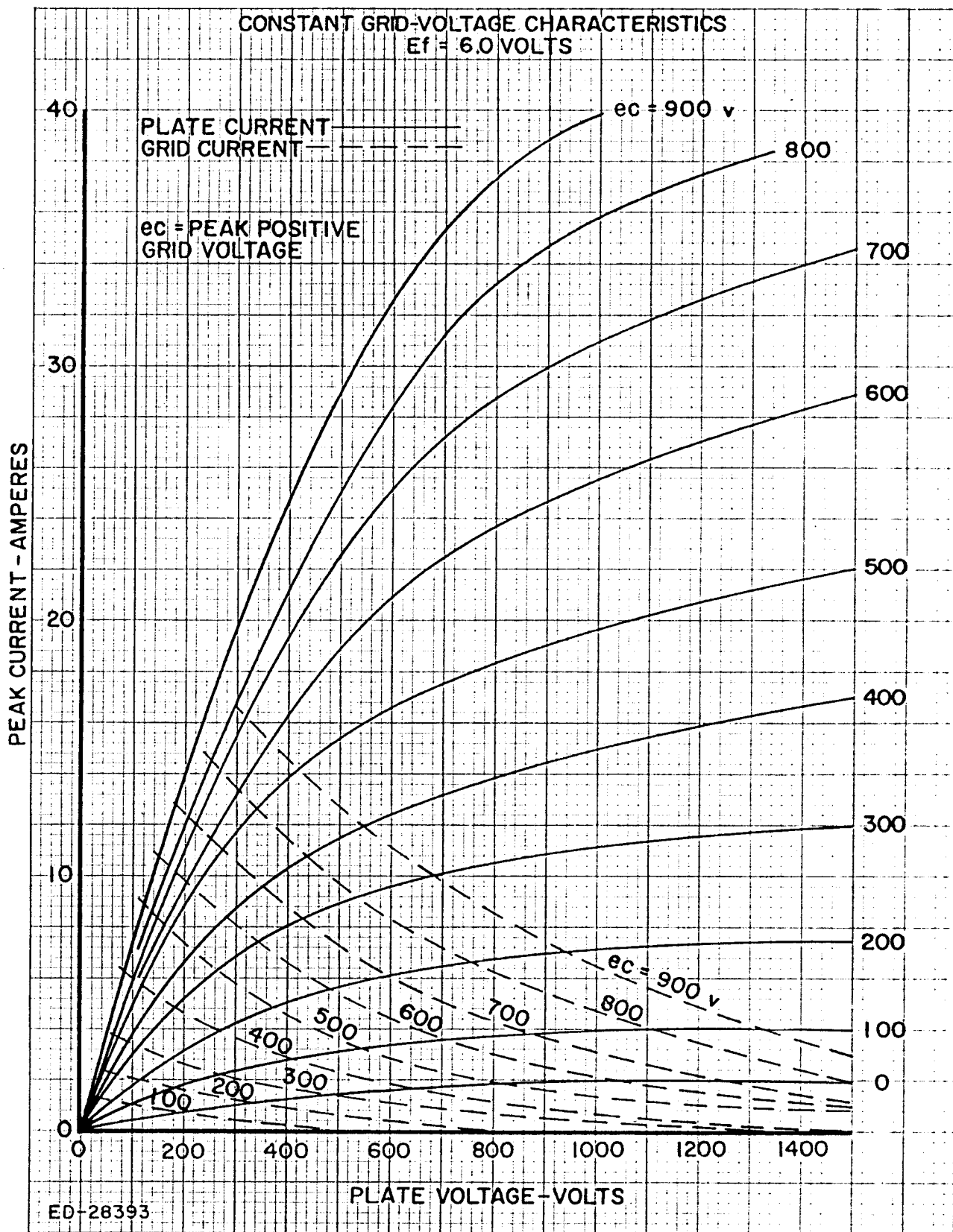
Typical Operation

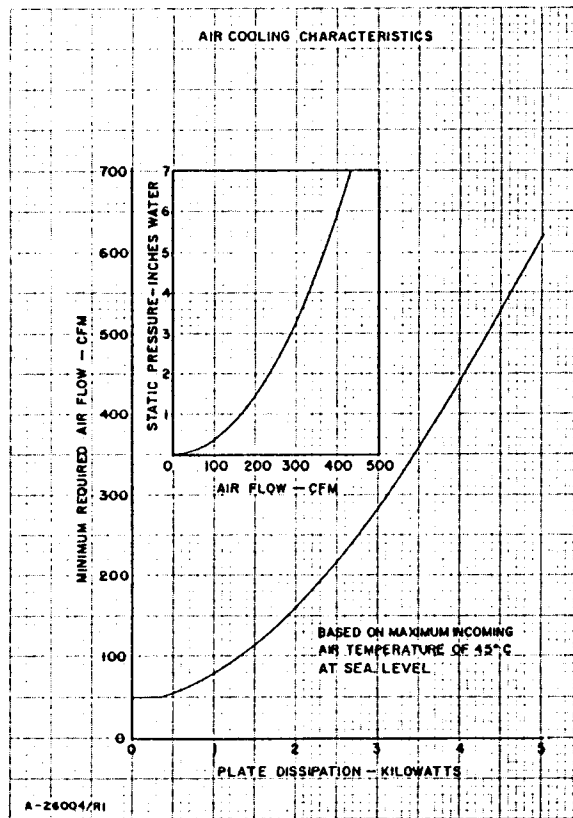
D-C Plate Voltage	8	16	kV
D-C Grid Voltage	-100	-200	volts
Pulse Positive Grid Voltage	250	1000	volts
Pulse Plate Current	10	55	amp
Pulse Grid Current	0.8	5	amp
Pulse Driving Power	0.3	6	kw
Pulse Power Output	70	770	kw
Plate Output Voltage	7	14	kv
Pulse Duration*	500	25	μ sec
Duty Factor*	0.3	.003	

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

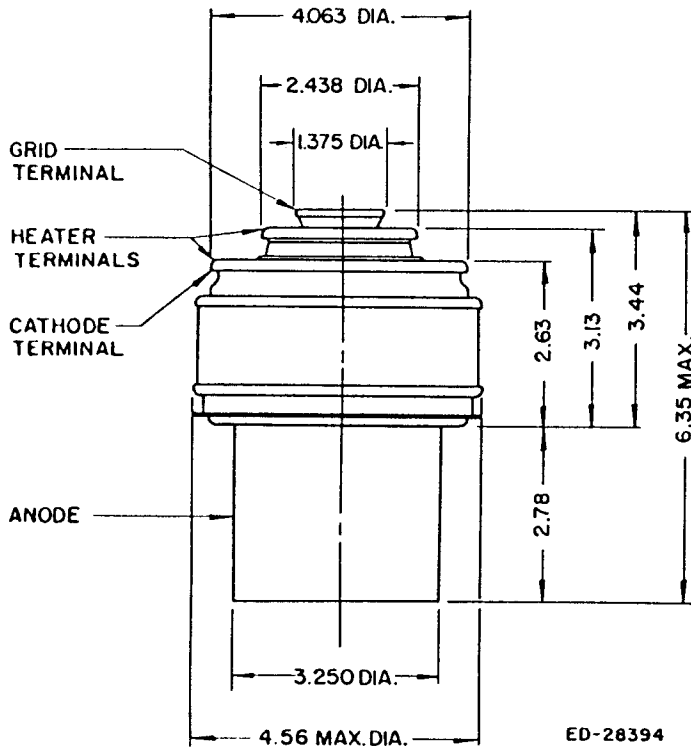


CUT-OFF CHARACTERISTICS



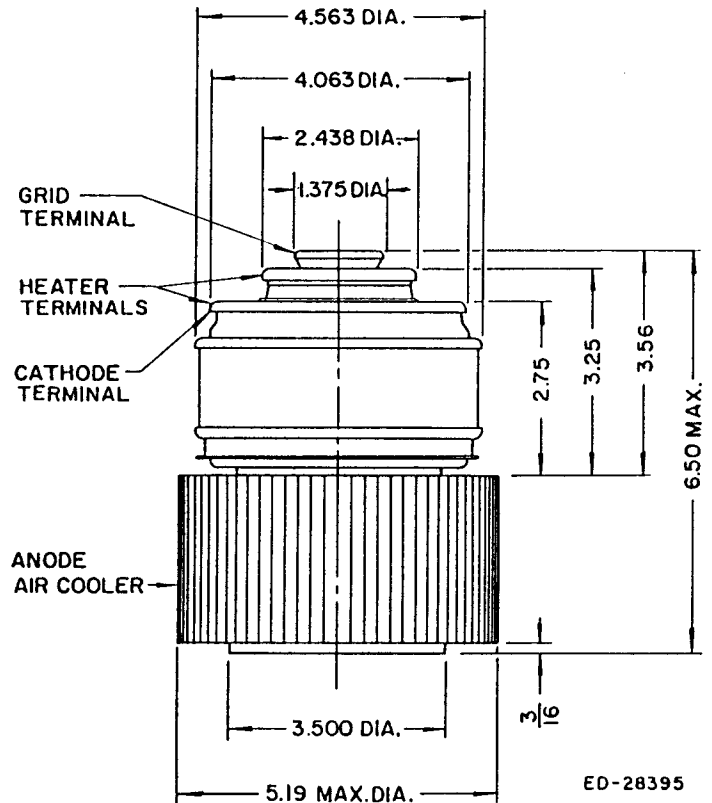


ML-7335



ALL DIMENSIONS IN INCHES
TOLERANCES TO BE DETERMINED

DIMENSIONS—ML-7334



ALL DIMENSIONS IN INCHES
TOLERANCES TO BE DETERMINED

DIMENSIONS—ML-7335

THE MACHLETT LABORATORIES, INC.

An Affiliate of Raytheon Company