



ELECTRONIC TUBE REFERENCE

356

Power - Triode (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Western Electric water-cooled transmitting triode for high-power modulation, amplification, and oscillator service. Its approximately 22.5 kW plate dissipation and 12.5 kV plate rating provide enormous audio or RF power for major transmitter installations.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	7.5 V / 170 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
AMPLIFICATION FACTOR	20
MAXIMUM PLATE VOLTAGE	12500 V
MAXIMUM PLATE DISSIPATION	22500 W
<i>Promoted fields populated from explicitly published ratings/characteristics; service-specific data retained as parameters.</i>	

Water-cooled high-power transmitting triode for modulator, amplifier, and oscillator service.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Amperex Condensed

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 AMPEREX CONDENSED

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	15000 V	RFPowerAmplifier
Plate current	4.4 A	RFPowerAmplifier
Power output	51000 W	RFPowerAmplifier
Control-grid voltage	-1500 V	RFPowerAmplifier
Grid current	370 mA	RFPowerAmplifier
Maximum frequency at full input	25 MHz	RFPowerAmplifier

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	24.5 pF	Section1
Grid-to-filament capacitance	35 pF	Section1
Plate-to-filament capacitance	2.5 pF	Section1

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 Machlette Laboratories

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1971 MACHLETTE LABORATORIES

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
requires less filament voltage and current; it replaces the [1]	880 kW	requires less filament voltage and current; it replaces the 880 cooled and is capable of dissipating 22.5 kW with a water
requires less filament voltage and current; it replaces the [2]	22.5 kW	requires less filament voltage and current; it replaces the 880 cooled and is capable of dissipating 22.5 kW with a water
when provisions are made for the reduced filament power flow of approximately	12 mA	when provisions are made for the reduced filament power flow of approximately 12 gpm. The cathode is a thuriated-
tube, differing only in its lower grid-cathode capacitance. It insulators or tension springs. Maximum ratings of	12.5 kV	tube, differing only in its lower grid-cathode capacitance. It insulators or tension springs. Maximum ratings of 12.5 kVdc
replaces the [1]	5771 kW	replaces the 5771 directly in industrial-oscillator equipment plate voltage and 60 kW plate input apply ac frequencies up
replaces the [2]	60 kW	replaces the 5771 directly in industrial-oscillator equipment plate voltage and 60 kW plate input apply ac frequencies up
and also in radio-transmitting equipment. The lower grid- to [1]	25 MHz	and also in radio-transmitting equipment. The lower grid- to 25 Mc; operation at 50 Mc is permissible with the voltage
and also in radio-transmitting equipment. The lower grid- to [2]	50 MHz	and also in radio-transmitting equipment. The lower grid- to 25 Mc; operation at 50 Mc is permissible with the voltage
cathode capacitance of the ML	356 mA	cathode capacitance of the ML-356 may require slight circuit and input reduced to three-quarters maximum ratings.
Filament Voltage	7.5 V	Filament Voltage ... 7.5 Volts
Filament Current at [1]	7.5 V	Filament Current at 7.5 Volts coooiiiiiii 170 Amps
Filament Current at [2]	170 V	Filament Current at 7.5 Volts coooiiiiiii 170 Amps
Filament Starting Current, maximum	800 A	Filament Starting Current, maximum ... 800 Amps
Filament Cold Resistance	0.0056 ohm	Filament Cold Resistance 0.0056 Ohms
Amplification Factor	20	Amplification Factor ... 20

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Water flow on anode, minimum for [1]	22.5 kW	Water flow on anode, minimum for 22.5 kW dissipation 12 gpm
Water flow on anode, minimum for [2]	12 kW	Water flow on anode, minimum for 22.5 kW dissipation 12 gpm
Maximum outgoing water temperature	70 mA	Maximum outgoing water temperature 70 °C
Maximum Glass Temperature ..0,	165 mA	Maximum Glass Temperature ..0, 165 °C
temperature at the hottest point below	165	temperature at the hottest point below 165°C. Heat radiating connectors for grid and filament posts are recommended
D-C Plate Voltage ..0 [1]	12500 V	D-C Plate Voltage ..0 12500 volts modulation factor of 1.0
D-C Plate Voltage ..0 [2]	1 V	D-C Plate Voltage ..0 12500 volts modulation factor of 1.0
Max. Signal Plate Input® [1]	45 V	Max. Signal Plate Input® ... 45 kw D-C Plate Voltage ccoooooviviiiiviii 10000 volts
Max. Signal Plate Input® [2]	10000 V	Max. Signal Plate Input® ... 45 kw D-C Plate Voltage ccoooooviviiiiviii 10000 volts
Plate Dissipation™® [1]	225 V	Plate Dissipation™ ® ... 225 kW D-C Grid Voltage . .. —2000 volts
Plate Dissipation™® [2]	-2000 V	Plate Dissipation™ ® ... 225 kW D-C Grid Voltage . .. —2000 volts
Typical Operation (Values are for [1])	2 A	Typical Operation (Values are for 2 tubes) D-C Plate Current .. 4 amps
Typical Operation (Values are for [2])	4 A	Typical Operation (Values are for 2 tubes) D-C Plate Current .. 4 amps
D-C Grid Current	0.8	D-C Grid Current 0.8 amp
D-C Plate Voltage ..., [1]	12500 V	D-C Plate Voltage ..., 12500 volts Plate Input ... 40 kW
D-C Plate Voltage ..., [2]	40 V	D-C Plate Voltage ..., 12500 volts Plate Input ... 40 kW
D-C Grid Voltage [1]	-600 V	D-C Grid Voltage —600 volts Plate Dissipation ..0 15 kw
D-C Grid Voltage [2]	15 V	D-C Grid Voltage —600 volts Plate Dissipation ..0 15 kw
Peak A-F Grid-to-Grid Voltage	1900 V	Peak A-F Grid-to-Grid Voltage 1900 volts
Zero-Signal D-C Plate Current [1]	1 V	Zero-Signal D-C Plate Current 1 amp D-C Plate Voltage ..0 10000 volts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Zero-Signal D-C Plate Current [2]	10000 V	Zero-Signal D-C Plate Current 1 amp D-C Plate Voltage ..o 10000 volts
Max.-Signal D-C Plate Current [1]	6.4 V	Max.-Signal D-C Plate Current 6.4 amps D-C Grid Voltage ... — 840 volts
Max.-Signal D-C Plate Current [2]	840 V	Max.-Signal D-C Plate Current 6.4 amps D-C Grid Voltage ... — 840 volts
Effective Load Resistance (Plate to Plate) ohms Peak R-F Grid Voltage .. w1	440 V	Effective Load Resistance (Plate to Plate) ohms Peak R-F Grid Voltage .. w1440 volts
Max.-Signal Driving Power, approximate watts D-C Plate Current	3.8 A	Max.-Signal Driving Power, approximate watts D-C Plate Current 3.8 amps
Max.-Signal Power Output, approximate kw D-C Grid Current, approximate	0.78 mA	Max.-Signal Power Output, approximate kw D-C Grid Current, approximate 0.78 amp
Driving Power, approximate	1010 mA	Driving Power, approximate ... 1010 watts
Averaged over any audio-frequency cycle of sine-wave form. Power Output, approximate	29 mA	Averaged over any audio-frequency cycle of sine-wave form. Power Output, approximate ... 29 kW
D-C Plate Voltage [1]	12500 V	D-C Plate Voltage ... 12500 15000 volts
D-C Plate Voltage [2]	15000 V	D-C Plate Voltage ... 12500 15000 volts
D-C Plate Voltage [ESTUTR [1]	12500 V	D-C Plate Voltage [ESTUTR . 12500 voles D-C Grid Voltage —2000 — 2000 volts
D-C Plate Voltage [ESTUTR [2]	-2000 V	D-C Plate Voltage [ESTUTR . 12500 voles D-C Grid Voltage —2000 — 2000 volts
D-C Plate Voltage [ESTUTR [3]	-2000 V	D-C Plate Voltage [ESTUTR . 12500 voles D-C Grid Voltage —2000 — 2000 volts
D-C Plate Current RO 4 A [1]	4 A	D-C Plate Current RO 4 amps D-C Piate Current 6 6 amps
D-C Plate Current RO 6 A [2]	6 A	D-C Plate Current RO 4 amps D-C Piate Current 6 6 amps
D-C Plate Current RO 6 A [3]	6 A	D-C Plate Current RO 4 amps D-C Piate Current 6 6 amps
Plate Input [1]	33 kW	Plate Input - 33 kW D-C Grid Current ... 0.8 0.8 amp
Plate Input [2]	0.8 kW	Plate Input - 33 kW D-C Grid Current ... 0.8 0.8 amp

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Input [3]	0.8 kW	Plate Input - 33 kW D-C Grid Current ... 0.8 0.8 amp
Plate Input [1]	60	Plate Input 60 67.5
Plate Input [2]	67.5	Plate Input 60 67.5
Plate Dissipation	225 kW	Plate Dissipation 225 kW
Plate Dissipation [1]	225 kW	Plate Dissipation 22,5 22.5 kW
Plate Dissipation [2]	22.5 kW	Plate Dissipation 22,5 22.5 kW
Typical Operation Frequency [1]	25 MHz	Typical Operation Frequency 25 2 Mc
Typical Operation Frequency [2]	2 MHz	Typical Operation Frequency 25 2 Mc
D-C Grid Voltage EUUTRTR [1]	-625 V	D-C Grid Voltage EUUTRTR —625 volts D-C Plate Voltage 10000 10000 12500 15000 volts
D-C Grid Voltage EUUTRTR [2]	10000 V	D-C Grid Voltage EUUTRTR —625 volts D-C Plate Voltage 10000 10000 12500 15000 volts
D-C Grid Voltage EUUTRTR [3]	10000 V	D-C Grid Voltage EUUTRTR —625 volts D-C Plate Voltage 10000 10000 12500 15000 volts
D-C Grid Voltage EUUTRTR [4]	12500 V	D-C Grid Voltage EUUTRTR —625 volts D-C Plate Voltage 10000 10000 12500 15000 volts
D-C Grid Voltage EUUTRTR [5]	15000 V	D-C Grid Voltage EUUTRTR —625 volts D-C Plate Voltage 10000 10000 12500 15000 volts
D-C Grid Voltage ... — [1]	1150 V	D-C Grid Voltage ... — 1150 —1300 —1400 —1500 volts
D-C Grid Voltage ... — [2]	-1300 V	D-C Grid Voltage ... — 1150 —1300 —1400 —1500 volts
D-C Grid Voltage ... — [3]	-1400 V	D-C Grid Voltage ... — 1150 —1300 —1400 —1500 volts
D-C Grid Voltage ... — [4]	-1500 V	D-C Grid Voltage ... — 1150 —1300 —1400 —1500 volts
Peak R-F Grid Voltage	625 V	Peak R-F Grid Voltage 625 volts
Peak R-F Grid Voltage [1]	1810 V	Peak R-F Grid Voltage .. 1810 2080 2060 2130 volts
Peak R-F Grid Voltage [2]	2080 V	Peak R-F Grid Voltage .. 1810 2080 2060 2130 volts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak R-F Grid Voltage [3]	2060 V	Peak R-F Grid Voltage .. 1810 2080 2060 2130 volts
Peak R-F Grid Voltage [4]	2130 V	Peak R-F Grid Voltage .. 1810 2080 2060 2130 volts
D-C Plate Current ... [PPSO TR [1]	2.4 V	D-C Plate Current ... [PPSO TR 2.4 amps Peak R-F Plate Voltage .. 7900 7600 9900 12500 volts
D-C Plate Current ... [PPSO TR [2]	7900 V	D-C Plate Current ... [PPSO TR 2.4 amps Peak R-F Plate Voltage .. 7900 7600 9900 12500 volts
D-C Plate Current ... [PPSO TR [3]	7600 V	D-C Plate Current ... [PPSO TR 2.4 amps Peak R-F Plate Voltage .. 7900 7600 9900 12500 volts
D-C Plate Current ... [PPSO TR [4]	9900 V	D-C Plate Current ... [PPSO TR 2.4 amps Peak R-F Plate Voltage .. 7900 7600 9900 12500 volts
D-C Plate Current ... [PPSO TR [5]	12500 V	D-C Plate Current ... [PPSO TR 2.4 amps Peak R-F Plate Voltage .. 7900 7600 9900 12500 volts
D-C Grid Current [1]	0 mA	D-C Grid Current ... 0 amp D-C Plate Current ... 4.5 5.6 4.7 4.4 amps
D-C Grid Current [2]	4.5 A	D-C Grid Current ... 0 amp D-C Plate Current ... 4.5 5.6 4.7 4.4 amps
D-C Grid Current [3]	5.6 A	D-C Grid Current ... 0 amp D-C Plate Current ... 4.5 5.6 4.7 4.4 amps
D-C Grid Current [4]	4.7 A	D-C Grid Current ... 0 amp D-C Plate Current ... 4.5 5.6 4.7 4.4 amps
D-C Grid Current [5]	4.4 A	D-C Grid Current ... 0 amp D-C Plate Current ... 4.5 5.6 4.7 4.4 amps
Driving Power, approximatel	1070 mA	Driving Power, approximatel 1070 watts D-C Grid Current, ap-
Power Output, approximate	12 mA	Power Output, approximate 12 kW
Published value [1]	1 mA	1 At crest of audio-frequency cycle with modulation factor of 1.0. mate ... 960 1440 850 770 watts
Published value [2]	1 mA	1 At crest of audio-frequency cycle with modulation factor of 1.0. mate ... 960 1440 850 770 watts
Published value [3]	960 mA	1 At crest of audio-frequency cycle with modulation factor of 1.0. mate ... 960 1440 850 770 watts
Published value [4]	1440 mA	1 At crest of audio-frequency cycle with modulation factor of 1.0. mate ... 960 1440 850 770 watts