



ELECTRONIC TUBE REFERENCE

891

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

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
TRIODE

Water-cooled high-power transmitting triode used in broadcast transmitters and industrial RF heating. Designed for amplifier, oscillator, and modulator service, with published Class C operation producing roughly 10 kW RF output.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	22 V / 60 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Triode	
TRANSCONDUCTANCE	0.004 S
AMPLIFICATION FACTOR	8.5
MAXIMUM PLATE VOLTAGE	12000 V
MAXIMUM PLATE DISSIPATION	6000 W
MAXIMUM CATHODE CURRENT	2.5 A
<i>Promoted ratings/characteristics mapped from printed headings; device/service-specific values retained in parameters.</i>	

Water-cooled high-power transmitting triode used in 5 and 10 kW broadcasting stations and RF heating.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 General Electric Transmitting Types

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

1950 GENERAL ELECTRIC TRANSMITTING TYPES

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	15000 V	—
Maximum Plate Dissipation	6000 W	—
Maximum Cathode Current	2.5 A	—
Maximum Signal Power Output	22 kW	AudioFrequency,ClassB



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1953 Amperex

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

1953 AMPEREX

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater/Filament Voltage	22 V	Published datasheet value
Heater/Filament Current	120 A	Published datasheet value
Maximum Plate/Anode Voltage	15000 V	Published datasheet value
Maximum Plate/Anode Dissipation	7500 W	Published datasheet value

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	4000 μ S	Published datasheet value
Amplification Factor	8	Published datasheet value



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1958 Amperex Industrial

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

1958 AMPEREX INDUSTRIAL

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	10000 V	RFPowerAmplifier;ClassC
Plate current	1.45 A	RFPowerAmplifier;ClassC
Power output	10000 W	RFPowerAmplifier;ClassC
Control-grid voltage	-3000 V	RFPowerAmplifier;ClassC
Grid current	150 mA	RFPowerAmplifier;ClassC
Maximum frequency at full input	1.6 MHz	RFPowerAmplifier

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	28 pF	Section1
Grid-to-filament capacitance	16 pF	Section1
Plate-to-filament capacitance	3 pF	Section1



SOURCE DATA APPENDIX

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	10000 V	RFPowerAmplifier
Plate current	1.45 A	RFPowerAmplifier
Power output	10000 W	RFPowerAmplifier
Control-grid voltage	-3000 V	RFPowerAmplifier
Grid current	150 mA	RFPowerAmplifier
Maximum frequency at full input	1.6 MHz	RFPowerAmplifier

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	28 pF	Section1
Grid-to-filament capacitance	16 pF	Section1
Plate-to-filament capacitance	3 pF	Section1



SOURCE DATA APPENDIX

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
The ML [1]	891 kV	The ML-891 and ML-891R are three electrode tubes mately 450 cϕm. Maximum ratings of 12 kVdc plate voltage

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The ML [2]	891 kV	The ML-891 and ML-891R are three electrode tubes mately 450 cfm. Maximum ratings of 12 kVdc plate voltage
The ML [3]	450 kV	The ML-891 and ML-891R are three electrode tubes mately 450 cfm. Maximum ratings of 12 kVdc plate voltage
The ML [4]	12 kV	The ML-891 and ML-891R are three electrode tubes mately 450 cfm. Maximum ratings of 12 kVdc plate voltage
designed specifically for use as modulators, amplifiers or and [1]	18 kV	designed specifically for use as modulators, amplifiers or and 18 kW plate input for the ML-891 and 10 kVdc plate
designed specifically for use as modulators, amplifiers or and [2]	891 kV	designed specifically for use as modulators, amplifiers or and 18 kW plate input for the ML-891 and 10 kVdc plate
designed specifically for use as modulators, amplifiers or and [3]	10 kV	designed specifically for use as modulators, amplifiers or and 18 kW plate input for the ML-891 and 10 kVdc plate
oscillators in radio transmitting service. The cathode of each voltage and [1]	15 kW	oscillators in radio transmitting service. The cathode of each voltage and 15 kW plate input for the ML-891R apply at
oscillators in radio transmitting service. The cathode of each voltage and [2]	891 kW	oscillators in radio transmitting service. The cathode of each voltage and 15 kW plate input for the ML-891R apply at
cooled anode capable of dissipating	6 kW	cooled anode capable of dissipating 6 kW with moderate with plate voltage and plate input reduced according to the
capable of dissipating	4 kW	capable of dissipating 4 kW with an air flow of approxi-
Filament Voltage	22 V	Filament Voltage 22 Volts
Filament Current	60 A	Filament Current 60 Amps
Filament Starting Current, maximum	120 A	Filament Starting Current, maximum 120 Amps
Filament Cold Resistance	0.031 ohm	Filament Cold Resistance ... 0.031 Ohms
Amplification Factor	8.5	Amplification Factor ... 8.5
Interelectrode Capacitances: ML [1]	891	Interelectrode Capacitances: ML-891 ML-891R
Interelectrode Capacitances: ML [2]	891	Interelectrode Capacitances: ML-891 ML-891R

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Water flow on anode [1]	3 gpm	Water flow on anode ... 3-8 gpm
Water flow on anode [2]	-8 gpm	Water flow on anode ... 3-8 gpm
Maximum water pressure	80 mA	Maximum water pressure ... 80 psi
Maximum outgoing water temperature	70 mA	Maximum outgoing water temperature .. 70 °C
Air flow on anode, minimum for [1]	4 kW	Air flow on anode, minimum for 4 kW dissipation 450 cfm at 0.5" Water
Air flow on anode, minimum for [2]	450 kW	Air flow on anode, minimum for 4 kW dissipation 450 cfm at 0.5" Water
Air flow on anode, minimum for [3]	0.5 kW	Air flow on anode, minimum for 4 kW dissipation 450 cfm at 0.5" Water
Maximum incoming air temperature	45 mA	Maximum incoming air temperature 45 °C
Maximum Glass Temperature ... ,	160 mA	Maximum Glass Temperature ..., ... 160 °C
D-C Platc Voltage ccooocns [1]	15000 V	D-C Platc Voltage ccooocns 15000 10000 volts Maxi Rati)]
D-C Platc Voltage ccooocns [2]	10000 V	D-C Platc Voltage ccooocns 15000 10000 volts Maxi Rati)]
Max.-Signal D-C Plate Current* [1]	2 A	Max.-Signal D-C Plate Current* 2.0 2.0 amps "'D"fg'"', 'l'ate'*g';figfzbsomite Valuef A%Lo%;;) ' Mgggg)k ol
Max.-Signal D-C Plate Current* [2]	2 A	Max.-Signal D-C Plate Current* 2.0 2.0 amps "'D"fg'"', 'l'ate'*g';figfzbsomite Valuef A%Lo%;;) ' Mgggg)k ol
Max.-Signa(Plate Input' [1]	20000 V	Max.-Signa(Plate Input' 20000 10500 watts D-C Gl'd Vol(age _3000 _3000 volts
Max.-Signa(Plate Input' [2]	10500 V	Max.-Signa(Plate Input' 20000 10500 watts D-C Gl'd Vol(age _3000 _3000 volts
Max.-Signa(Plate Input' [3]	3000 V	Max.-Signa(Plate Input' 20000 10500 watts D-C Gl'd Vol(age _3000 _3000 volts
Max.-Signa(Plate Input' [4]	3000 V	Max.-Signa(Plate Input' 20000 10500 watts D-C Gl'd Vol(age _3000 _3000 volts
Plate Dissipation™® [1]	5000 A	Plate Dissipation™® ... 5000 3500 watts D-C Plate Current 1.0 1.0 amps
Plate Dissipation™® [2]	3500 A	Plate Dissipation™® ... 5000 3500 watts D-C Plate Current 1.0 1.0 amps
Plate Dissipation™® [3]	1 A	Plate Dissipation™® ... 5000 3500 watts D-C Plate Current 1.0 1.0 amps

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Dissipation™® [4]	1 A	Plate Dissipation™® ... 5000 3500 watts D-C Plate Current 1.0 1.0 amps
Typical Operation (Values are for [1])	2	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [2])	891	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [3])	806	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [4])	1	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [5])	5	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [6])	800	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
Typical Operation (Values are for [7])	1	Typical Operation (Values are for 2 tubes) ML-891 I?l-c C;rid Current ... 806(1)(5) 800(1?) amp
N-C Plate Voltage [1]	3000 V	N-C Plate Voltage 3000 12500 volts ate Input watts
N-C Plate Voltage [2]	12500 V	N-C Plate Voltage 3000 12500 volts ate Input watts
Peak A-F Grid to Grid Voltage [1]	2260 V	Peak A-F Grid to Grid Voltage . 2260 3760 volts YI%-C Plgte VoTta 6000 8000 volts
Peak A-F Grid to Grid Voltage [2]	3760 V	Peak A-F Grid to Grid Voltage . 2260 3760 volts YI%-C Plgte VoTta 6000 8000 volts
Peak A-F Grid to Grid Voltage [3]	6000 V	Peak A-F Grid to Grid Voltage . 2260 3760 volts YI%-C Plgte VoTta 6000 8000 volts
Peak A-F Grid to Grid Voltage [4]	8000 V	Peak A-F Grid to Grid Voltage . 2260 3760 volts YI%-C Plgte VoTta 6000 8000 volts
Zero Signal D-C Plate Current [1]	0.5	Zero Signal D-C Plate Current ... 0.5 04 amp DC Grid Voltagee " " " " " " " " " " : —2000 —2400 v:Its
Zero Signal D-C Plate Current [2]	4	Zero Signal D-C Plate Current ... 0.5 04 amp DC Grid Voltagee " " " " " " " " " " : —2000 —2400 v:Its
Zero Signal D-C Plate Current [3]	-2000	Zero Signal D-C Plate Current ... 0.5 04 amp DC Grid Voltagee " " " " " " " " " " : —2000 —2400 v:Its

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Zero Signal D-C Plate Current [4]	-2400	Zero Signal D-C Plate Current ... 0.5 04 amp DC Grid Voltage " " : —2000 —2400 v:Its
Max.-Signal D-C Plate Current [1]	2.1 V	Max.-Signal D-C Plate Current 2.1 2.5 amps Peak R-F Grid %/oltae " " - 2650 3100 volts
Max.-Signal D-C Plate Current [2]	2.5 V	Max.-Signal D-C Plate Current 2.1 2.5 amps Peak R-F Grid %/oltae " " - 2650 3100 volts
Max.-Signal D-C Plate Current [3]	2650 V	Max.-Signal D-C Plate Current 2.1 2.5 amps Peak R-F Grid %/oltae " " - 2650 3100 volts
Max.-Signal D-C Plate Current [4]	3100 V	Max.-Signal D-C Plate Current 2.1 2.5 amps Peak R-F Grid %/oltae " " - 2650 3100 volts
Eff. Load Resistance, Plate to Plate [1]	8000 ohm	Eff. Load Resistance, Plate to Plate .. 8000 12000 ohms D.C Plate Currenc Bç - 0.5 0.78 am
Eff. Load Resistance, Plate to Plate [2]	12000 ohm	Eff. Load Resistance, Plate to Plate .. 8000 12000 ohms D.C Plate Currenc Bç - 0.5 0.78 am
Eff. Load Resistance, Plate to Plate [3]	0.5 ohm	Eff. Load Resistance, Plate to Plate .. 8000 12000 ohms D.C Plate Currenc Bç - 0.5 0.78 am
Eff. Load Resistance, Plate to Plate [4]	0.78 ohm	Eff. Load Resistance, Plate to Plate .. 8000 12000 ohms D.C Plate Currenc Bç - 0.5 0.78 am
Max.-Signal Driving Power, approx [1]	50 mA	Max.-Signal Driving Power, approx. .. 50 245 watts D-C Grid Current, apptox. .. 0 1 0.08 amp
Max.-Signal Driving Power, approx [2]	245 mA	Max.-Signal Driving Power, approx. .. 50 245 watts D-C Grid Current, apptox. .. 0 1 0.08 amp
Max.-Signal Driving Power, approx [3]	0 mA	Max.-Signal Driving Power, approx. .. 50 245 watts D-C Grid Current, apptox. .. 0 1 0.08 amp
Max.-Signal Driving Power, approx [4]	1 mA	Max.-Signal Driving Power, approx. .. 50 245 watts D-C Grid Current, apptox. .. 0 1 0.08 amp
Max.-Signal Driving Power, approx [5]	0.08 mA	Max.-Signal Driving Power, approx. .. 50 245 watts D-C Grid Current, apptox. .. 0 1 0.08 amp
Max.-Signal Power Output, approx [1]	10000 mA	Max.-Signal Power Output, approx. .. 10000 22000 watts Driving Power ap,prg)l(). o 260 260 wags
Max.-Signal Power Output, approx [2]	22000 mA	Max.-Signal Power Output, approx. .. 10000 22000 watts Driving Power ap,prg)l(). o 260 260 wags
Max.-Signal Power Output, approx [3]	260 mA	Max.-Signal Power Output, approx. .. 10000 22000 watts Driving Power ap,prg)l(). o 260 260 wags

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