



ELECTRONIC TUBE REFERENCE

8020

Rectifier - Half Wave electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

RECTIFIER

High-vacuum half-wave rectifier for very-high-voltage, low-current applications. Rated for approximately 40 kV peak inverse voltage, 100 mA average output, and 1.5 A peak current.

GENERAL CHARACTERISTICS

BASE DESIGNATION	Medium 4-p bayonet	BASE PINS	4
NOMINAL HEATER	5 V / 6.5 A	PARALLEL HEATER	– / –
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
MAXIMUM PLATE DISSIPATION	60 W
PEAK INVERSE VOLTAGE	40000 V
NOMINAL OUTPUT CURRENT	100 mA
PEAK FORWARD CURRENT	1.5 A
FORWARD VOLTAGE DROP	200 V
WARM-UP TIME	5 s
<i>Promoted maximum ratings/characteristics populated from published headings; service-specific values retained in parameters.</i>	

High-vacuum rectifier for very-high-voltage low-current applications.

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 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
X-ray shielding required above	16000 V	—

SOURCE OPERATING CONDITIONS

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1962 Eimac

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

1962 EIMAC

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The [1]	8020 mA	The 8020 has a maximum dc current rating of 100 milliamperes and a
The [2]	100 mA	The 8020 has a maximum dc current rating of 100 milliamperes and a
maximum peak inverse voltage rating of	40000 V	maximum peak inverse voltage rating of 40,000 volts. Cooling is by convec-
A single [1]	8020 V	A single 8020 will deliver 80 milliamperes at 17,000 volts to a capacitor-
A single [2]	80 V	A single 8020 will deliver 80 milliamperes at 17,000 volts to a capacitor-

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
A single [3]	17000 V	A single 8020 will deliver 80 milliamperes at 17,000 volts to a capacitor-
input filter with [1]	14000 V	input filter with 14,000 volts single-phase supply. Four 8020's in a bridge
input filter with [2]	8020 V	input filter with 14,000 volts single-phase supply. Four 8020's in a bridge
circuit will deliver [1]	200 V	circuit will deliver 200 milliamperes at 25,000 volts to a choke-input filter
circuit will deliver [2]	25000 V	circuit will deliver 200 milliamperes at 25,000 volts to a choke-input filter
Voltage	50 V	Voltage - - - - - 50 volts
Current	6.5 A	Current - - - - - 6.5 amperes
Peak Inverse Plate Voltage e T4 X [1]	0 V	Peak Inverse Plate Voltage e T4 X 00 0] volts
Peak Inverse Plate Voltage e T4 X [2]	0 V	Peak Inverse Plate Voltage e T4 X 00 0] volts
Plate Dissipation	60 W	Plate Dissipation - - . 60 watts
DC Plate Current* - - - - - - - - - - e e e e e e e o	100 mA	DC Plate Current* - - - - - e e e e e e e o - 100 ma
Peak Plate Current - - - - - - - - - e - - - e e	1.5 A	Peak Plate Current - - - - - e - - - e e - - 1.5 ampere
Published value	1	1 Averaged over one cycle for each tube. Applies only when the rectifier is coupled to the load by a choke-input filter incorporat-
perature is "Tempilaq," a temperature-sensitive lacquer Capacitor-Input Filter—The	8020	perature is "Tempilaq," a temperature-sensitive lacquer Capacitor-Input Filter—The 8020 is particularly suitable for
available from the Tempil Corporation, [1]	132	available from the Tempil Corporation, 132 W. 22nd St., power-supply applications demanding high voltage at low
available from the Tempil Corporation, [2]	22	available from the Tempil Corporation, 132 W. 22nd St., power-supply applications demanding high voltage at low
New York	11	New York 11, N. Y. current. Under these conditions capacitor-input filter circuits
ELECTRICAL	8020	ELECTRICAL 8020 when no input choke is incorporated in the filter de-
the	8020	the 8020 begins to show color as the maximum plate dissipa- the peak value of current to which the tubes will be subjected

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
inverse voltage rating of	40000 V	inverse voltage rating of 40,000 volts should not be exceeded
in Fig	2	in Fig. 2 as a percentage of the effective load resistance per
Published value	8020	8020 MAXIMUM PERFORMANCE CAPABILITIES the internal resistance of the rectifier tube, R_y , the added
R, is the plate resistance of the	8020	R, is the plate resistance of the 8020, which may be taken
Published value	1	1 One-half the transformer secondary voltage. Tubes may be operated in parallel to increase the output
peak current usually limits the dc current which the [1]	8020	peak current usually limits the dc current which the 8020 is Fig. 2, the plate resistance (R) will be half as great and the
peak current usually limits the dc current which the [2]	2	peak current usually limits the dc current which the 8020 is Fig. 2, the plate resistance (R) will be half as great and the
Published value [1]	8020 V	8020 is 40,000 volts. In single-phase power-supply rectifier
Published value [2]	40000 V	8020 is 40,000 volts. In single-phase power-supply rectifier
Choke-Input Filter—The maximum dc current rating of the peak ac supply voltage ([1]	1.41	Choke-Input Filter—The maximum dc current rating of the peak ac supply voltage (1.41 times E_{ps} in Fig. 2) in the
Choke-Input Filter—The maximum dc current rating of the peak ac supply voltage ([2]	2	Choke-Input Filter—The maximum dc current rating of the peak ac supply voltage (1.41 times E_{ps} in Fig. 2) in the
ductance (L in Fig	1	ductance (L in Fig. 1): inverse voltage in three-phase operation depends upon the
$L_o =$	788	$L_o = 788F$ for full-wave single-phase rectifiers, Hiter circuits assume values of input capacitance large enough
is low, the	8020	is low, the 8020 is capable of larger dc output currents.
Published value [1]	0 mA	0 =3 Ge& for full-wave three-phase rectifiers, maximum current rating of the 8020 is 200 milliamperes.
Published value [2]	3 mA	0 =3 Ge& for full-wave three-phase rectifiers, maximum current rating of the 8020 is 200 milliamperes.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Published value [3]	8020 mA	0 =3 Ge& for full-wave three-phase rectifiers, maximum current rating of the 8020 is 200 milliamperes.


SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Eimac Tube Manual

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

1965 EIMAC TUBE MANUAL

Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament Voltage Range	4.75–5.25 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Seal Temperature Maximum	225 C	—
DC Output Current Capacitor Input	80 mA	CapacitorInputFilter
DC Output Voltage Capacitor Input	17000 V	CapacitorInputFilter
AC Supply Voltage Capacitor Input	14000 V	SinglePhase
DC Output Current Bridge Choke Input	200 mA	ChokeInputFilter
DC Output Voltage Bridge Choke Input	25000 V	ChokeInputFilter
AC Supply Voltage Bridge Choke Input	28000 V	SinglePhase


SOURCE DATA APPENDIX

1971 RCA HB3 Binder 6 of 7

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

1971 RCA HB3 BINDER 6 OF 7
Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater/filament voltage nominal	5 V	WholeTube
Heater/filament current nominal	6 A	WholeTube
Anode to Filament	1.4	Published source row
Published electrical value	9215 V	Published source row
Published electrical value (value 2)	9 V	Published source row
Verified Rectifier forward voltage drop	200 V	Verified from supplied datasheet rating/characteristic table

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Voltage	5 V	Published source row
Current	5 A	Published source row
Current (value 2)	5 A	Published source row
Current (value 3)	6.5 A	Published source row
PEAK INVERSE ANODE VOLTAGE 1,A0	0 mA	Published source row
AVERAGE ANODE CURRENT	100 mA	Published source row
FILAIIFI~IT VOLTAGE	5.8 V	Published source row
PEAK FOR`r7ARD ANODE VOLTAGE	12500 V	Published source row
AVERAGE ANODE DISSIPATION	75	Published source row
Filament Voltage	5 V	Published source row
Filament Voltage (value 2)	-5 V	Published source row
Peak Forward Anode Voltage	10000 V	Published source row
Minimum Peak Anode Current	2 A	Published source row
Peak inverse plate voltage	0 V	Promoted field corroboration

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Rectifier average current	100 mA	Promoted field corroboration
Rectifier peak forward current	2 mA	Promoted field corroboration
Verified Peak inverse plate voltage	14000 V	Verified from supplied datasheet rating/characteristic table
Verified Rectifier average output current	100 mA	Verified from supplied datasheet rating/characteristic table
Verified Rectifier peak forward current	750 mA	Verified from supplied datasheet rating/characteristic table



SOURCE OPERATING CONDITIONS

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1975 Eimac Tube Manual

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

1975 EIMAC TUBE MANUAL

Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament Voltage Range	4.75–5.25 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Seal Temperature Maximum	225 C	—
DC Output Current Capacitor Input	80 mA	CapacitorInputFilter;SingleTube
DC Output Voltage Capacitor Input	17000 V	CapacitorInputFilter;SingleTube
AC Supply Voltage Capacitor Input	14000 V	CapacitorInputFilter;SinglePhase
DC Output Current Bridge Choke Input	200 mA	ChokeInputFilter;Bridge
DC Output Voltage Bridge Choke Input	25000 V	ChokeInputFilter;Bridge

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AC Supply Voltage Bridge Choke Input	28000 V	ChokeInputFilter;SinglePhase


SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1976 Eimac Tube Manual

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

1976 EIMAC TUBE MANUAL

Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament Voltage Range	4.75–5.25 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Seal Temperature Maximum	225 C	—
DC Output Current Capacitor Input	80 mA	CapacitorInputFilter;SingleTube
DC Output Voltage Capacitor Input	17000 V	CapacitorInputFilter;SingleTube
AC Supply Voltage Capacitor Input	14000 V	CapacitorInputFilter;SinglePhase
DC Output Current Bridge Choke Input	200 mA	ChokeInputFilter;Bridge
DC Output Voltage Bridge Choke Input	25000 V	ChokeInputFilter;Bridge
AC Supply Voltage Bridge Choke Input	28000 V	ChokeInputFilter;SinglePhase


SOURCE DATA APPENDIX

1999 Philips 0-D

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

1999 PHILIPS 0-D
Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Surge limiter operating filament voltage	5.5 V	Published datasheet value
Surge limiter operating anode voltage	10 kV	Published datasheet value
Surge limiter minimum peak anode current	2 A—	Published datasheet value
Maximum surge-limiter anode voltage	—12.5 kV	Published datasheet value
Maximum peak inverse voltage	—40 kV	Published datasheet value
Maximum anode dissipation	—75 W	Published datasheet value
Maximum rectifier peak anode current	—750 mA	Published datasheet value
Maximum average rectifier current	—100 mA	Published datasheet value

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode-filament capacitance	1.4 pF	Published datasheet value

TUBE TINKER

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