

Svetlana 3CX10,000A7/8160 High-Mu Power Triode



The Svetlana™ 3CX10,000A7/8160 is a high-performance ceramic/metal power triode designed for use in zero-bias, class B RF or audio amplifiers. A modern mesh filament is used, replacing the old-fashioned hairpin construction. The improved mesh filament design ensures better mechanical rigidity and long lasting concentricity of the filament, providing enhanced linearity, less noise, reduced warm-up variation and longer life. The low-inductance, mesh-filament basket also forms a natural extension of the cylindrical stem geometry into the active area, giving superior VHF performance.

The Svetlana 3CX10,000A7/8160 is manufactured in the Svetlana Electron Devices complex in St. Petersburg, Russia. Svetlana has achieved the improved performance described above with exact replacement compatibility with the 3CX10,000A7/8160 manufactured in the United States.



Svetlana 3CX10,000A7/8160

General Characteristics

Electrical

Filament	Thoriated-tungsten mesh
Voltage	7.50 ±0.37V
Current @ 7.50V	100A
Amplification factor (average)	200
Direct interelectrode capacitances (grounded grid):	
Input	59.0pF
Output	36.0pF
Feedback	0.2pF
Direct interelectrode capacitances (grounded filament):	
Input	59.0pF
Output	0.2pF
Feedback	36.0pF
Maximum frequency for full ratings (CW)	160 MHz

Mechanical

Cooling	Forced air
Base	Coaxial
Socketing	Eimac 1300 or equiv.
Air chimney	Eimac 1306 or equiv.
Operating position	Vertical, Base up or down
Maximum operating temperature	250° C
Maximum dimensions:	
Length	222.25 mm (8.75 in.)
Diameter	179.07 mm (7.05 in.)
Net weight	5.45 kg (12 lb)

Cathode-Driven Radio Frequency Linear Amplifier, Class B

Maximum Ratings			
DC plate voltage	10,000		V
DC plate current	5.0		A
Plate dissipation	12		kW
Grid dissipation	500		W
Typical operation			
DC plate voltage	7000	7000	V
Zero-signal DC plate current*	0.60	0.60	A
Single-tone DC plate current	3.72	5.00	A
Grid bias	0	0	V
Single-tone DC grid current*	0.71	1.00	A
Peak driving power	885	1540	W
Single-tone plate output power	17.7	24.2	kW
Resonant load impedance	1020	745	Ohms
Driving impedance	35	32	Ohms

*Approximate values

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Cathode-Driven Class C RF Amplifier, CW or FM

<i>Maximum Ratings</i>		
DC plate voltage	10,000	V
DC plate current	4.0	A
Plate dissipation	10	kW
Grid dissipation	500	W
<i>Typical operation</i>		
DC plate voltage	7600	V
DC grid voltage	-110	V
DC plate current	3.68	A
DC grid current*	0.78	A
Peak RF cathode voltage*	400	V
Driving power*	1510	W
Plate output power	22.5	kW

Audio Frequency Amplifier or Modulator, Class AB, Grid Driven

<i>Maximum ratings (per tube)</i>		
DC plate voltage	8000	V
DC plate current	5.0	A
Plate dissipation	12	kW
Grid dissipation	500	W

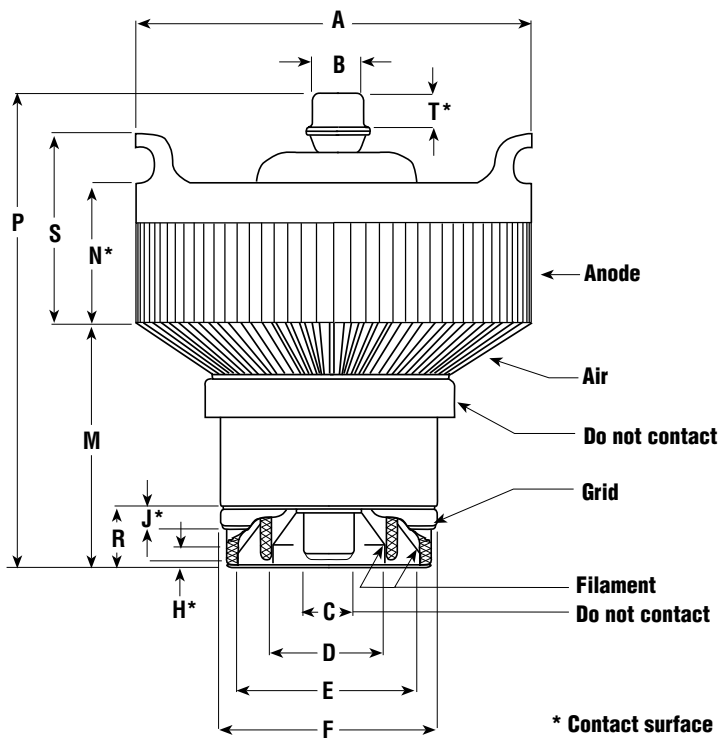
Typical operation (two tubes, sinusoidal waveform)

DC plate voltage	7000	7000	Vdc
DC grid voltage	0	0	V
Zero-signal DC plate current*	1.2	1.2	A
Maximum-signal DC plate current	7.5	7.5	A
Maximum-signal DC grid current*	1.5	2.1	A
Peak AF grid voltage**	250	250	V
Peak driving power	315	560	W
Plate output power	35.6	47.7	kW
Load resistance (plate-to-plate)	2000	1520	Ohms

*Approximate Values **Per tube

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3CX10,000A7/8160 Outline Drawing



Dimensional Data				
Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	175.97	179.07	6.928	7.050
B	21.72	22.73	0.855	0.895
C	18.29	19.30	0.720	0.760
D	48.16	49.17	1.896	1.936
E	79.58	80.59	3.133	3.173
F	96.32	97.33	3.792	3.832
H	4.78	—	0.188	—
J	4.78	—	0.188	—
M	100.33	109.22	3.950	4.300
N	61.26	70.82	2.412	2.788
P	209.55	222.25	8.250	8.750
R	25.04	26.67	0.986	1.050
S	86.66	96.22	3.412	3.788
T	9.53	—	0.375	—

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Electrical Application

Filament Operation The rated filament voltage for the 3CX10,000A7/8160 is 7.50 volts. Filament voltage, as measured at the socket, should be maintained within 5% of this value to obtain maximum tube life.

Input Circuit A resonant tank circuit is recommended for grounded-grid operation. In a single-ended circuit the loaded “Q” should be at least 3. This technique increases linearity and output power.

Mechanical Application

Mounting The 3CX10,000A7/8160 must be mounted with its axis vertical. The base of the tube may be up or down.

Cooling Sufficient forced-air circulation must be provided to keep the temperature of the anode core and the temperatures of the ceramic/metal seals below 225°C. Airflow requirements to maintain these temperatures below 225°C with an inlet-air temperature of 50°C are tabulated. At frequencies above 30 MHz or at higher inlet-air temperatures, more airflow will be required.

*	Sea Level		10,000 Feet	
	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
Anode Dissipation Watts				
4000	105	0.24	154	0.35
8000	253	0.90	370	1.45
12,000	483	2.25	710	3.40

* Because the power dissipated by the filament represents about 750 watts and because grid dissipation can, under some conditions, represent another 500 watts, allowance has been made in preparing this tabulation for an additional 1250 watts.

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