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.

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ELECTRON DEVICES

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

Maximum Ratings		
DC plate voltage	*10,000*	*V*
DC plate current	*4.0*	*A*
Plate dissipation	*10*	*kW*
Grid dissipation	*500*	*W*
Typical operation		
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_2 Grid Driven

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

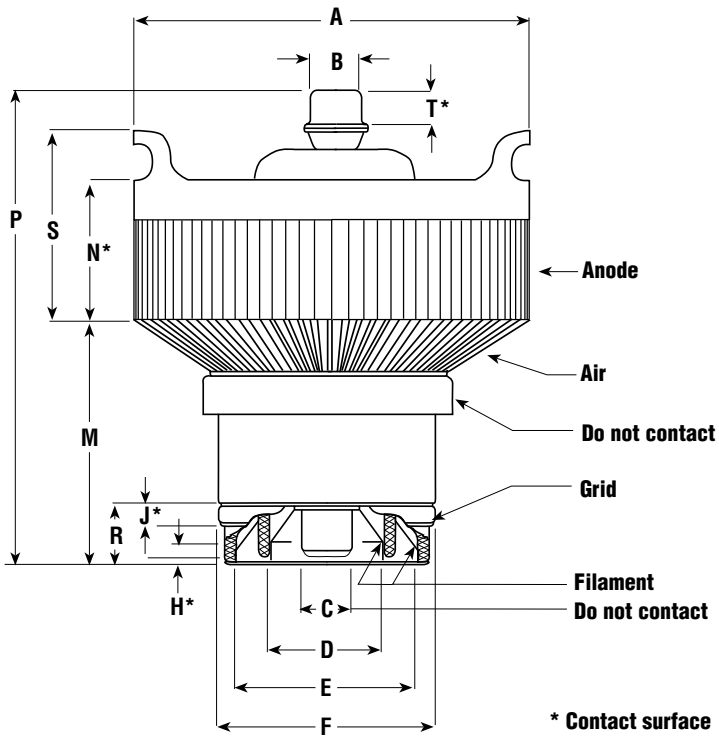
Typical operation *(two tubes, sinusoidal waveform)*

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*

3CX10,000A7/8160

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	
Anode Dissipation Watts	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
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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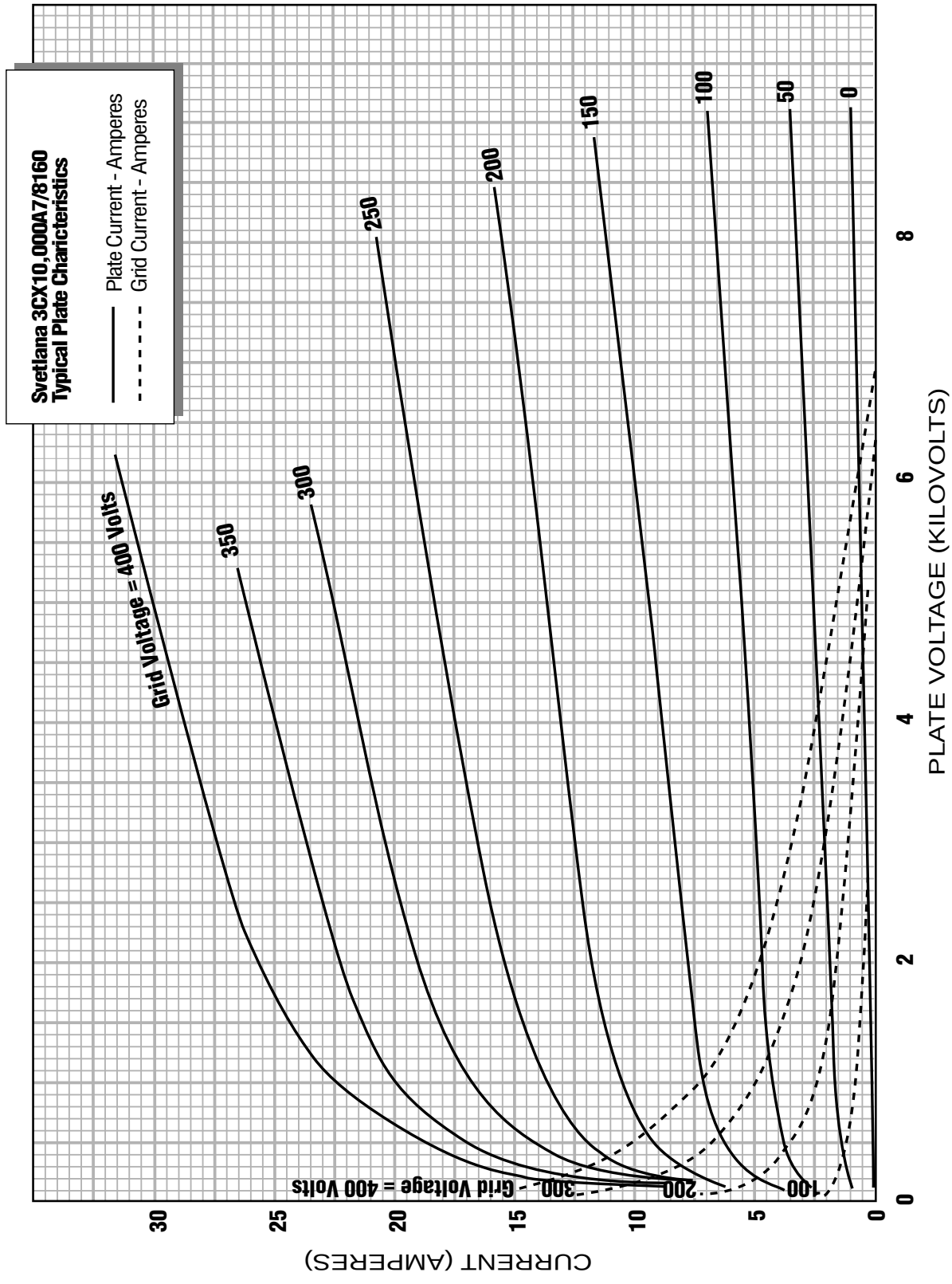

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