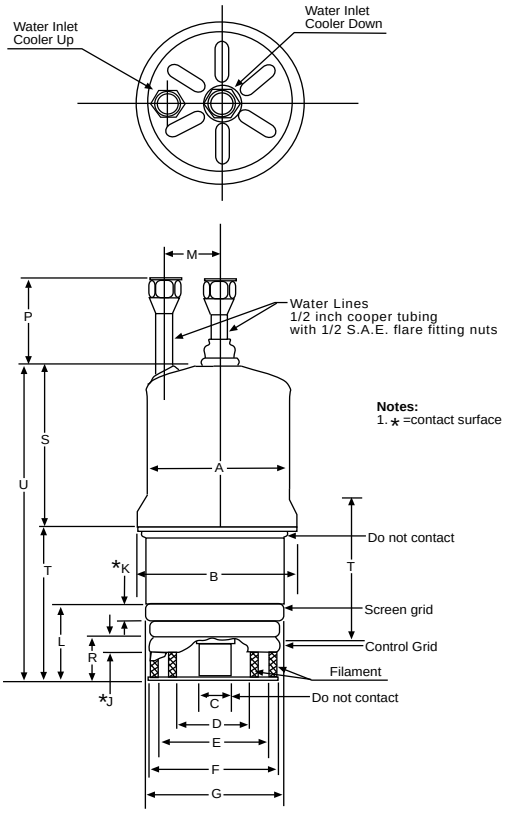
Svetlana 4CW10,000A/8661 Radial Beam Power Tetrode

The Svetlana™ 4CW10,000A/8661 is a liquid cooled ceramic meatal tetrode designed for audio and radio frequency applications. It is particularly well-suited for modulator and linear amplifier use. The Svetlana 4CW10,000A/8661 has a directly-heated thoriated tungsten mesh filament for mechanical ruggedness. This modern mesh filament design is superior to the old hairpin design of the 1950's. In some applications, the input circuit may need minor tuning to use the Svetlana 4CW10,000A/8661 as a replacement because of the low inductance of the Svetlana mesh filament.

The Svetlana 4CW10,000A/8661 is manufactured in the Svetlana factory in St. Petersburg, Russia, and is designed to be a direct replacement for the 4CW10,000A/8661 manufactured in the United States, England and elsewhere.

Svetlana 4CW10,000A/8661 Outline drawing



General Characteristics

Electrical

Filament:	*Thoriated tungsten mesh*	
Voltage	*7.5±0.37*	*V*
Current, at 7.5 Volts	*75*	*A*
Amplification factor (average)		
Grid to screen	*4.5*	
Direct interelectrode capacitances (grounded filament):		
Cin	*122*	*pF*
Cout	*23*	*pF*
Cgp	*1.0*	*pF*
Direct interelectrode capacitances (grounded grid):		
Cin	*58*	*pF*
Cout	*23*	*pF*
Cpk	*0.16*	*pF*
Maximum frequency for full ratings (CW)	*30*	*MHz*

Mechanical

Maximum overall dimensions:		
Length	*29.06 cm*	*(11.44 in)*
Diameter	*11.83 cm*	*(4.66 in)*
Net Weight	*3.4 kg*	*(7.5 lb)*
Operating Position	*Axis vertical, base up or down*	
Maximum operating temperature, ceramic/metal or anode core		*250˚*
Cooling		*Water and forced air*
Base	*Coaxial, designed for use with Svetlana SK300A*	

Dimensional Data

	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	103.8	105.6	4.094	4.156
B	116.6	118.3	4.594	4.656
C	18.2	19.3	.720	.760
D	48.1	49.2	1.896	1.936
E	79.5	80.6	3.133	3.173
F	96.3	97.4	3.792	3.832
G	101.0	102.2	3.980	4.020
J	4.7	—	.188	—
K	4.7	—	.188	—
L	44.8	46.4	1.764	1.826
M	38.1	44.5	1.500	1.750
P	58.7	71.5	2.312	2.812
R	25.0	26.7	.986	1.050
S	121.4	127.7	4.780	5.025
T	85.1	92.7	3.350	3.650
U	206.3	219.1	8.125	8.625

Svetlana

Svetlana 4CW10,000A/8661
Radial Beam Power Tetrode

Oscillator, RF Power Amplifier or Grid Driven, Class C FM Telephony - CarrierConditions

Absolute maximum ratings	at 110MHz	at 30MHz	
DC plate voltage	6500	7500	V
DC screen voltage	1500	1500	V
DC plate current	2.6	3.0	A
Plate dissipation	10.0	10.0	kW
Screen dissipation	250	250	W
Grid dissipation	75	75	W

Typical Operation at 30MHz		
DC plate voltage	7500	V
DC screen voltage	500	V
DC grid bias voltage	-350	V
DC plate current	2.8	A
DC screen current*	6.5	A
DC grid current*	0.25	A
Peak rf grid voltage*	590	V
Grid driving power	150	W
Plate dissipation	5.0	kW
Plate output power	16.0	kW

RF Linear Amplifier, Grid Driven, Class AB1

Absolute Maximum Ratings		
DC plate voltage	7500	V
DC screen voltage	1500	V
DC plate current	4.0	A
Plate dissipation	12,000	W
Screen dissipation	250	W
Grid dissipation	75	W

Typical Operation (Frequencies at 30 MHZ)		
DC plate voltage	7500	V
DC screen voltage	1500	V
DC grid voltage**	-340	V
Zero-signal DC plate current	0.5	A
Single-tone DC plate current	3.3	A
Single-tone DC screen current*	0.125	A
Peak RF grid voltage*	320	V
Plate dissipation	9050	W
Single-tone plate output power	15.95	kW

** Approximate values **Adjust for specified zero-signal plate current*

Minimum Cooling Requirements

Cooling of the base may be accomplished by directing approximately 3O CFM of air through the socket and over the filament and grid seals. Anode cooling is accomplished by circulating water through the integral water jacket as listed in the table below for several dissipation levels.

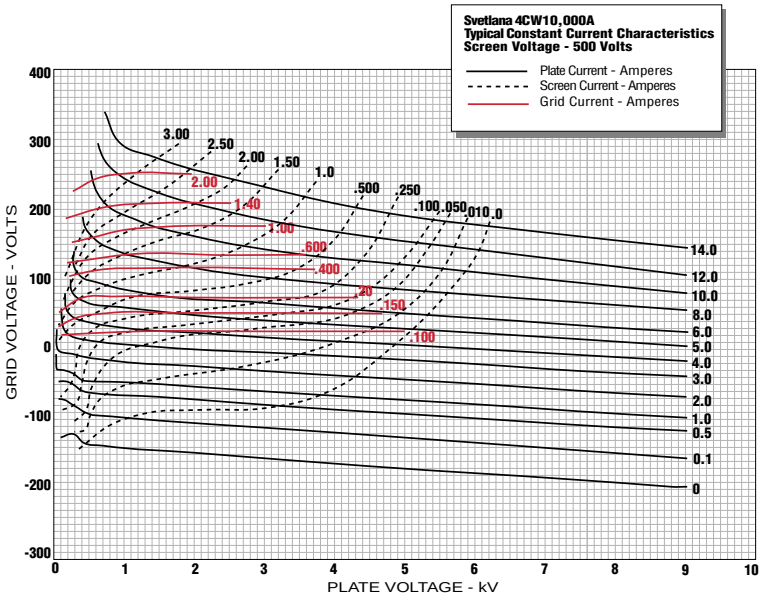
Minimum Cooling Water Requirement

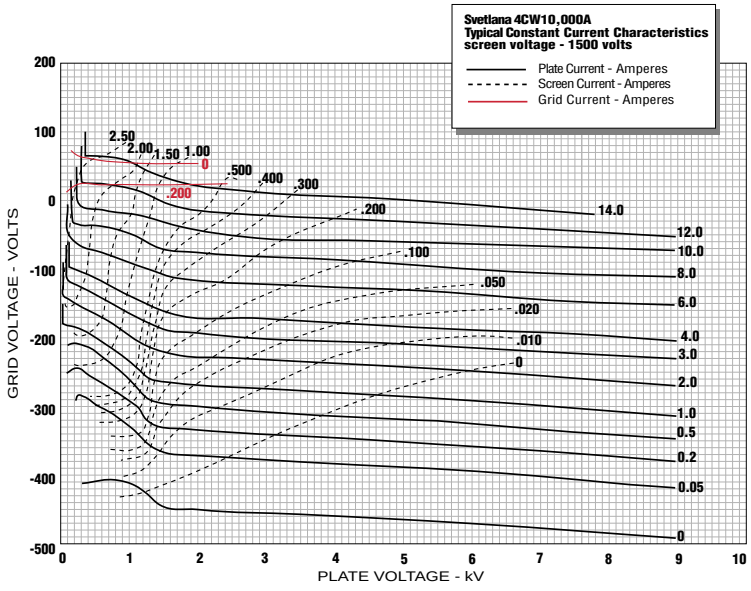
Plate Dissipation (kw)	Quantity (gpm)	Pressure Drop (psi)
6	4.0	2.2
8	5.1	3.1
10	6.3	4.3
12	7.4	5.5

NOTES:

1. Since power dissipated by the filaments represented about 560 watts and grid plus screen dissipation can represenr another 325 watts, an extra 900 watts has been added to plate dissipation in preparing tabulation.

2. Maximum outlet-water temperature must never exceed 70˚C and inlet-water pressure should be limited to 50 psi.





Svetlana