

DESCRIPTION

VA-943A, VA-944A, and VA-945A are five-cavity, forced-air and vapor-cooled klystrons for use as final amplifier tubes in both visual and aural sections of UHF-TV transmitters. When used in the visual socket, each tube will deliver peak-of-sync output of 12.5 kilowatts or more over its tunable range. These three klystrons cover the frequency range of 470 to 890 megahertz in three consecutive segments. Gain is at least 43 decibels, permitting optimum performance with very low drive power. The beam-control electrode, modulating anode, enables each tube to operate also in the aural section of the transmitter at reduced output level using the same beam supply as the visual section. Each tube uses an electromagnet for focusing and is self-centering in its magnet. Installation is simplified by rollers on the tube body which engage tracks in the electromagnet.

FEATURES

High Power --

Output in excess of 12.5 kW for reliable, long-life performance.

High Gain --

Gain of at least 43 dB produces an output of 12.5 kW with less than 600 milliwatts of drive power.

Ample Bandwidth --

One-dB bandwidth is at least 8 MHz over the tuning range.

Vapor Cooled Collector --

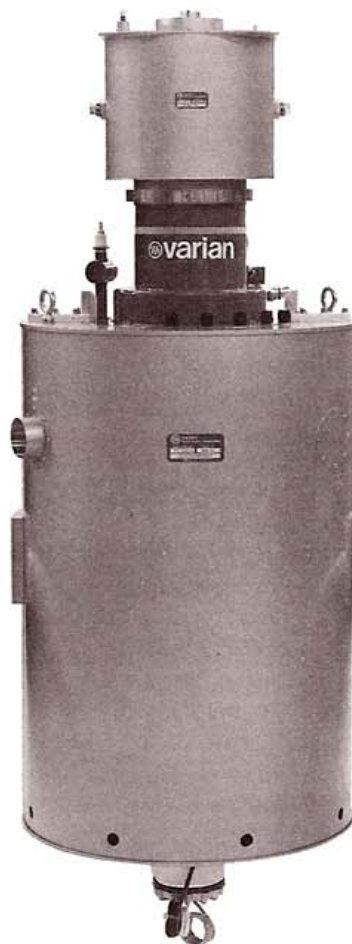
Reduces equipment size, noise, and cost; only 0.5 gal/min collector water flow required.

Air Cooled Body and Electromagnet --

Simplifies tube cooling system and reduces maintenance requirements.

Simple Installation and Operation --

Each tube can be furnished factory tuned to a specified frequency if desired, but is tunable over its entire frequency range. The electromagnet operates from a single power supply. Installing the tube is made easy by rollers on the tube which mate with channels in the electromagnet.



VA-943A, VA-944A, VA-945A

GENERAL CHARACTERISTICS

ELECTRICAL

Frequency Range	470 to 890 MHz
VA-943A	470 to 574 MHz
VA-944A	572 to 704 MHz
VA-945A	702 to 890 MHz
Heater Voltage	8 V
Heater Current, typical	20 A
Heater Warm-up Time, min	5 min
Focusing	VA-1943A Electromagnet

PHYSICAL

Dimensions	See Outline Drawings
Weight, max	250 lbs
Mounting Position	Cathode Down
Output	3-1/8 inch 50-Ω coaxial line
Cooling	Water Vapor and Forced Air
Collector Water Flow, min ⁴	0.5 gal/min
Body and Magnet, air flow, min .	100 ft ³ /min
Pressure Drop, at 100 ft ³ /min ..	5 in-H ₂ O
Cathode Air Flow, free delivery ..	50 ft ³ /min

OPERATING CONDITIONS AND RATINGS ^{1,2}

	Typical Operation	Maximum Ratings
Frequency, visual	635	--- MHz
Klystron Output, saturated	12.6	--- kW
Klystron Output, peak-of-sync ³	10.5	--- kW
Drive Power, peak-of-sync	330	--- mW
Gain, peak-of-sync	45	--- dB
Efficiency, saturated	37	--- %
Efficiency, peak-of-sync	31	--- %
Bandwidth, 1 dB	8	--- MHz
Beam Voltage	12.5	13 kVdc
Beam Current	2.7	3.1 Adc
Body Current	18	75 mAdc
Modulating Anode Voltage	12.5	13 kVdc
Modulating Anode Current	2	5 mAdc
Focusing Current	11	Adc
Load VSWR, operating	---	1.1:1
Load VSWR, non-destructive	---	1.5:1
Collector Temperature	105	145 °C

ELECTROMAGNET, VA-1943A

Total Power, maximum	
Voltage	100 Vdc
Current	15 Adc
Dimensions	20.25 dia x 32 in
Weight, maximum	800 lbs

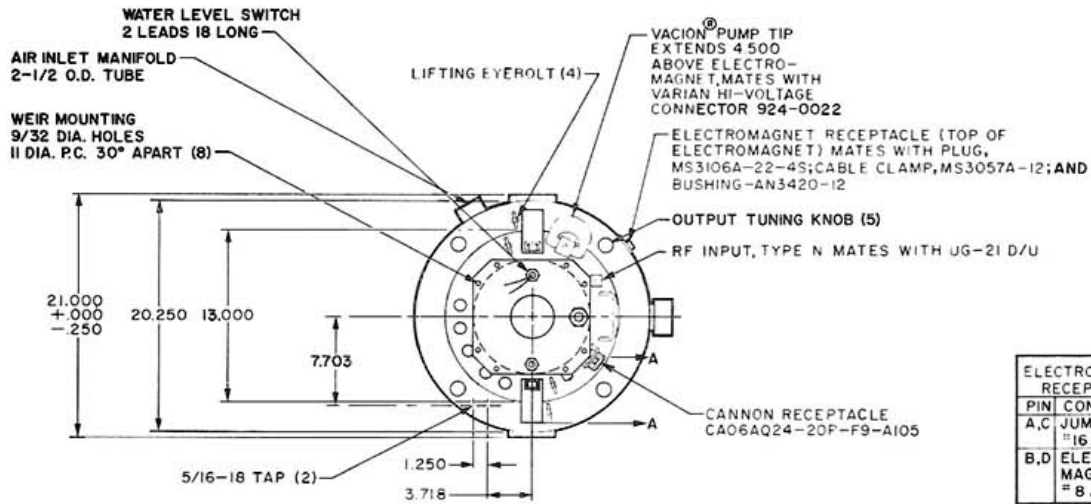
NOTES:

1. Characteristics and operating values are based on performance tests. These figures may be changed without notice as a result of additional information or product improvement. Varian Palo Alto Tube Division should be consulted before using this information for equipment design.
2. Ratings should not be exceeded under continuous or transient conditions. A single rating may be the limitation and simultaneous operation at more than one rating may damage the tube. Equipment design should

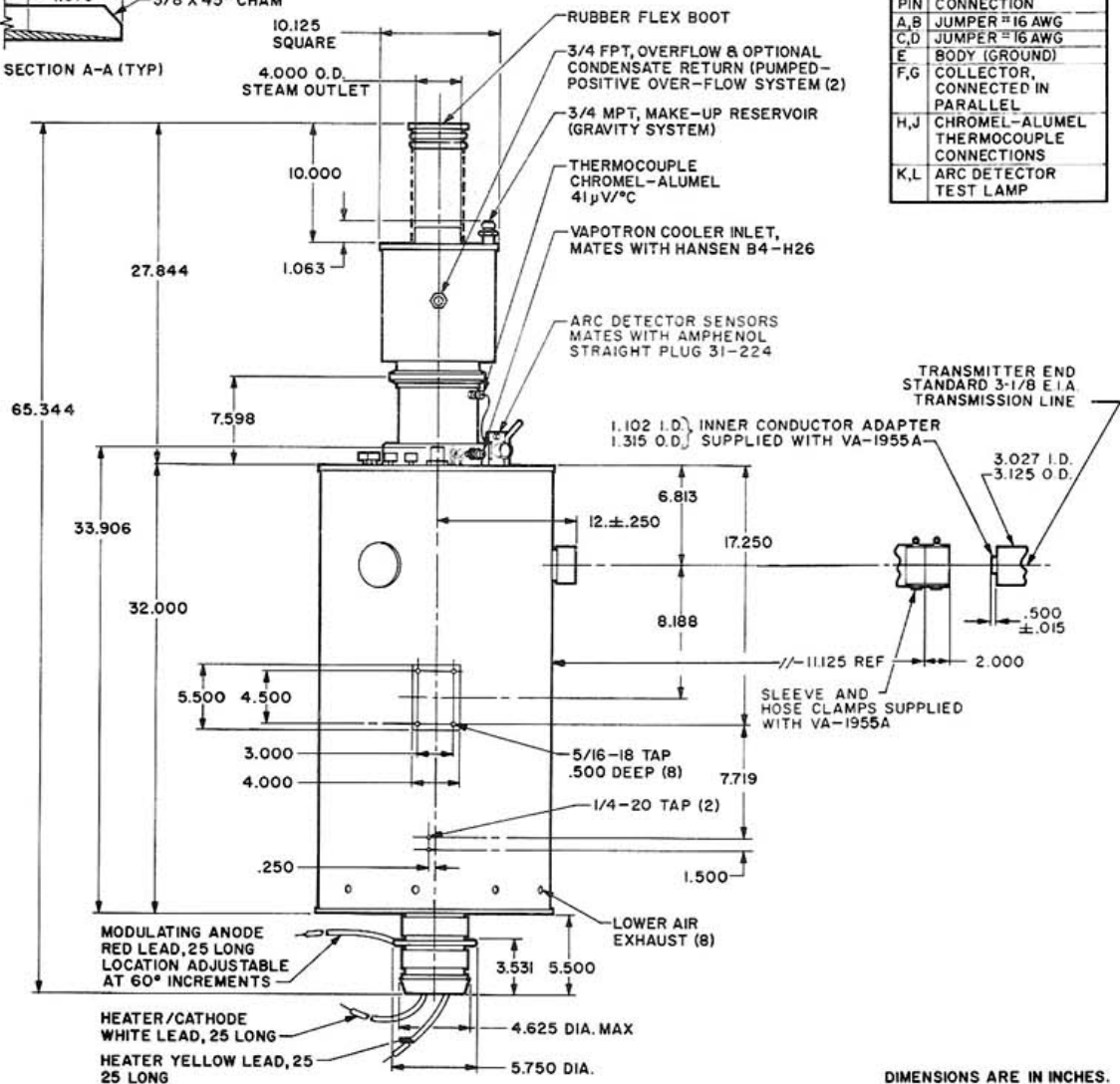
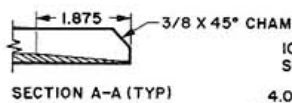
limit voltage and environmental variations so that the ratings will never be exceeded.

3. With pre-emphasized drive power applied.
4. The collector temperature is monitored by the chromel-alumel thermocouple attached to each tube at the point indicated on the outline drawing. Typical collector make-up water flow is 0.5 gal/min., although this may vary according to the cooling system used. Final criterion is complete coverage of the collector body during operation.

OUTLINE DRAWING



ELECTROMAGNET RECEPTACLE	
PIN	CONNECTION
A,C	JUMPER #16 AWG
B,D	ELECTRO-MAGNET #8 AWG



CANNON RECEPTACLE CA06AQ24-20P-F9-A105	
PIN	CONNECTION
A,B	JUMPER #16 AWG
C,D	JUMPER #16 AWG
E	BODY (GROUND)
F,G	COLLECTOR, CONNECTED IN PARALLEL
H,J	CHROMEL-ALUMEL THERMOCOUPLE CONNECTIONS
K,L	ARC DETECTOR TEST LAMP

DIMENSIONS ARE IN INCHES.