



varian
palo alto tube division

TECHNICAL DATA

VA-917A

CW KLYSTRON AMPLIFIER

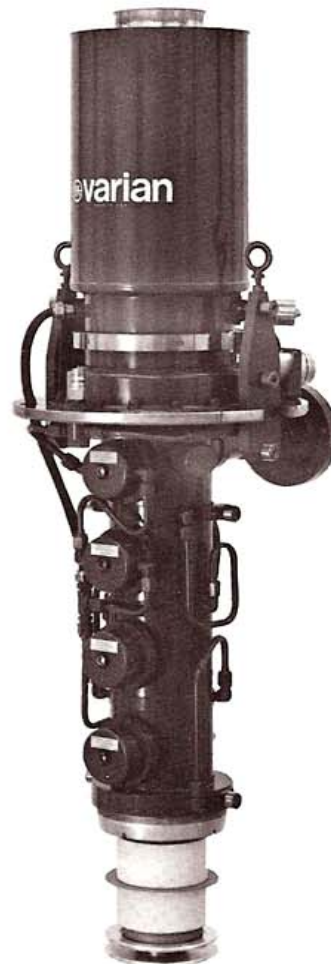
800-985 MHz
10 kW

DESCRIPTION

The VA-917A is a four-cavity, vapor-cooled klystron amplifier for use in troposcatter communication systems. The tube delivers an output of at least 10 kilowatts over its tunable frequency range of 800 to 985 megahertz. It includes an integral modulating anode which provides a convenient means for amplitude or pulse modulation. Conservative design and sturdy construction throughout assure long tube life. The VA-917A operates within the VA-1917A Electromagnet. Installation is simplified by rollers on the tube body which engage tracks in the electromagnet. Forced-air cooling of the cathode is required.

MAXIMUM RATINGS¹

Beam Voltage	13 kVdc
Beam Current	3 Adc
Collector Dissipation	39 kW
Body Current	100 mAdc
Heater Surge Current	34 Aac
Load VSWR ²	1.5:1
Body Coolant Inlet Temperature ...	70 °C
Hydrostatic Pressure	125 lbf/in ² g



GENERAL CHARACTERISTICS³

ELECTRICAL

Frequency	800 to 985 MHz
Power Output, min	10 kW
Heater Voltage	6.0 ± 0.5 Vac
Heater Current, typ	16 Aac
Heater Warm-up Time, min	5 min
Focusing	VA-1917A Electromagnet
Magnet Voltage	40 Vdc
Magnet Current	30 Adc

PHYSICAL

Dimensions	See Outline Drawings
Weight, approx	
Tube	130 lb
Magnet	160 lb
Mounting Position	Vertical, cathode down
Cooling	Water and Vapor
Connectors	See Outline Drawings

TYPICAL OPERATING CONDITIONS³BROADBAND
TUNED

Frequency	800	985 MHz
Power Output	12.4	10.3 kW
Drive Power	3.0	1.4 W
Gain	36.2	38.7 dB
Bandwidth, 3-dB	6	6 MHz
Beam Voltage	12.5	12.5 kVdc
Beam Current	2.84	2.84 Adc
Body Current	28	25 mAdc
Magnet Current	26	26 Adc

COOLING

Distilled water is the preferred coolant. A circulating system with a steam-air or steam-water condenser is recommended. Metals in the circulating system should be close to copper in the galvanic series. Maximum inlet coolant temperature should be 70°C for cooling systems

operating at atmospheric pressures at sea level. In addition, forced-air flow of 50 ft³/min should be directed at the cathode ceramic-to-metal seals. For different operating conditions, contact the nearest Varian Sales Office or the Palo Alto Tube Division for recommendations.

Water Flow, min

Body	1.5 gal/min
VA-1917A Electromagnet	1.5 gal/min

Pressure Drop, at min flow

Body	32 lbf/in ²
VA-1917A Electromagnet	13 lbf/in ²

NOTES:

1. 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.
2. Although the tube will withstand a load VSWR of 1.5:1,

the load VSWR must be 1.2:1 or less to produce an output of 10 kilowatts or more.

3. Characteristic and operating values are based on performance tests. These figures may change without notice as a result of additional data or product refinement. Varian Associates should be consulted before using this information for equipment design.

OPERATING HAZARDS

Read the following and take all necessary precautions to protect personnel. Safe operating conditions are the responsibility of the equipment designer and the user.

High Voltage. This tube operates at voltages which can be deadly. Equipment must be designed so personnel cannot come in contact with operating voltages. Enclose high-voltage circuits and terminals and provide fail-safe interlocking switch circuits to open the primary circuits of the power supply and to discharge high-voltage capacitors whenever access is required.

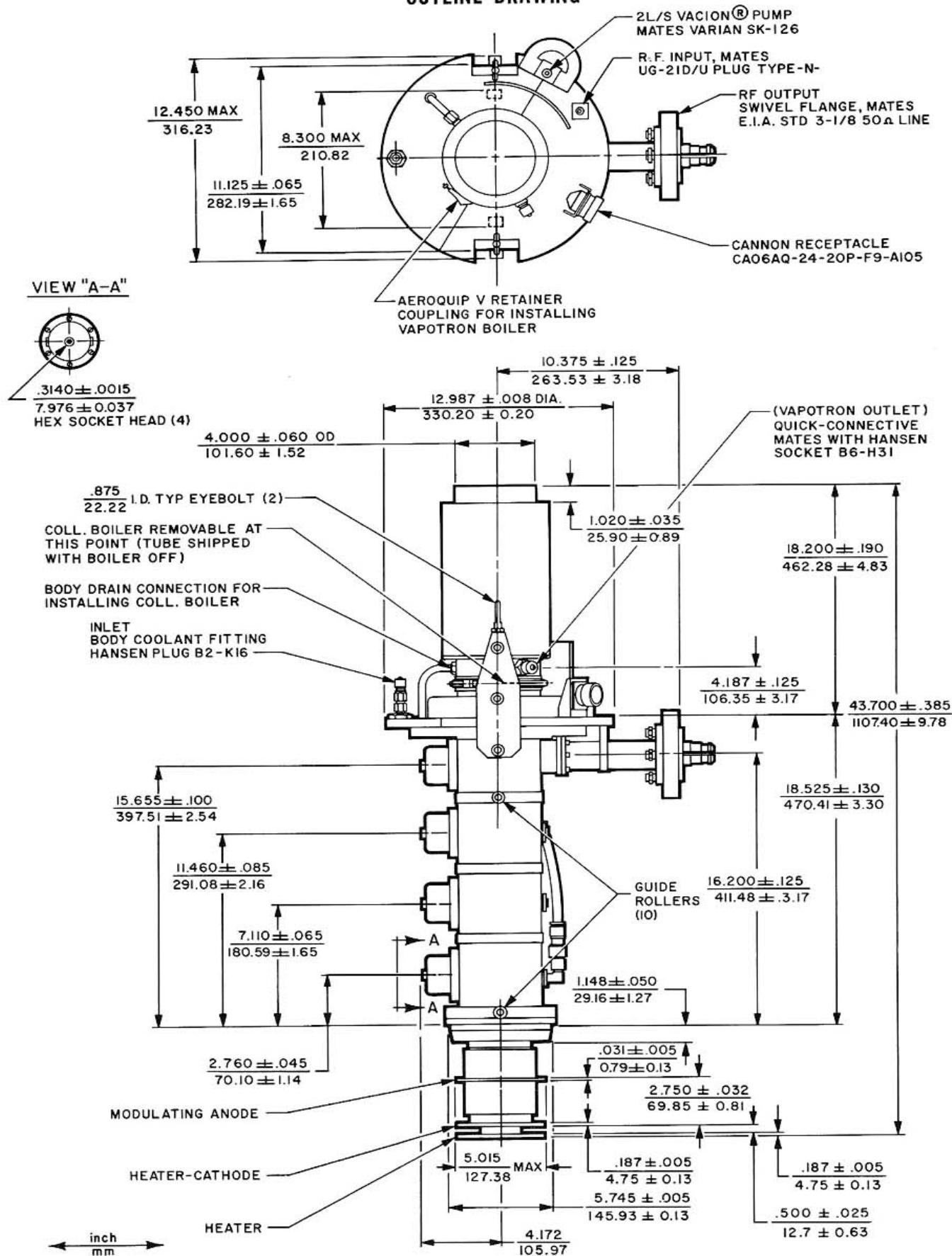
Microwave Radiation. Exposure of the human body to microwave radiation in excess of 1 milliwatt per square centimeter is unsafe and can result in blindness or other injury. Personnel must be fully protected from the microwave energy which radiates from this device. All input and output r-f connections, waveguide flanges, and gaskets must be r-f leakproof and

properly engaged. Never operate this device without a microwave-energy-absorbing load attached. Personnel must be prevented from looking into open waveguides or antennas while such a device is energized. (Ref. Proc. IRE, Vol. 49, No. 2, pp. 427-447, Feb. 1961).

X Rays. This device may produce X-ray radiation when energized. Operating personnel must be protected by appropriate shielding. Provide adequate X-ray shielding on all sides of this device, as well as the modulator and pulse transformer tanks. X-ray caution signs or labels must be permanently attached to equipment directing operating personnel never to operate this device without X-ray shielding in place.

Equipment must be designed to fully safeguard all personnel from these hazards. Labels and caution notices must be provided on equipment and in manuals clearly warning of those hazards which cannot be avoided.

OUTLINE DRAWING



OUTLINE DRAWING

