



varian
palo alto tube division

TECHNICAL DATA

3K3000LQ

CW KLYSTRON AMPLIFIER

720-985 MHz
2 kW

DESCRIPTION

The 3K3000LQ is a three-cavity, externally-tuned klystron amplifier for use in tropo-scatter communication systems. This tube delivers a narrowband CW output of 2 kilowatts or more over its tunable frequency range of 720 to 985 megahertz. The external cavities permit an unlimited number of tuning cycles without damaging the vacuum seals. The 3K3000LQ operates within the H-124 Circuit Assembly, which includes the focusing electromagnets, tunable cavities, output load coupler, and an SK-100 Air System Socket.

MAXIMUM RATINGS¹

Beam Voltage	9 kVdc
Beam Current	750 mAdc
Body Current ²	75 mAdc
Collector Dissipation ³	3 kW
Heater Surge Current	65 A
Focus Electrode Voltage	-500 Vdc
Load VSWR	2:1
Collector Temperature ³	175 °C



GENERAL CHARACTERISTICS⁴

ELECTRICAL

Frequency	720 to 985 MHz
Power Output, minimum	2 kW
Heater Voltage	7.5 V
Heater Current, typical	31 A
Heater Warm-up Time, minimum	5 min
Focusing	H-124 Circuit Assembly

PHYSICAL

Dimensions	See Outline Drawings
Weight, approximate	32 lb
Mounting Position	Vertical, cathode-up
Cooling	Forced Air
Connectors	See Outline Drawings

TYPICAL OPERATING CONDITIONS⁴

	Narrowband Tuned	
Frequency	850	850 MHz
Power Output	1.52	2.20 kW
Drive Power	4	10 W
Gain	25.8	23.4 dB
Efficiency	40	42 %
Body Current ²	30	30 mAdc
Beam Voltage	8	9 kVdc
Beam Current	480	580 mAdc
Focus-Electrode Voltage	-200	-200 Vdc
Focus-Coil Currents		
Prefocus	0.48	0.50 Adc
1st Body	2.3	2.3 Adc
2nd Body	1.6	2.65 Adc

COOLING

Values are for forced air at sea level and 20°C air inlet temperature.

	Air Flow	Pressure Drop
Cathode (with SK- 100 Air System Socket)..	5 ft ³ /min	0.4 in-H ₂ O
Output Cavity	50 ft ³ /min	1.0 in-H ₂ O
Collector	150 ft ³ /min	1.6 in-H ₂ O

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 not be possible. Equipment design should limit voltage and environmental variations so that the absolute ratings will never be exceeded.
2. While tuning the tube, body current should not exceed 100 mAdc.
3. If the tube is operated without drive power, the maximum

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 output connections, waveguide flanges, and gaskets must be r-f leakproof and prop-

H-124 CIRCUIT ASSEMBLY

Prefocus Coil, maximum

Voltage 50 Vdc

Current 1.5 Adc

Body Coils 2 and 3, maximum

Voltage 150 Vdc

Current 3 Adc

collector dissipation rating may be exceeded. Hence, the collector should be equipped with a thermal overload device which will remove the beam power when the collector temperature reaches 175°C.

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

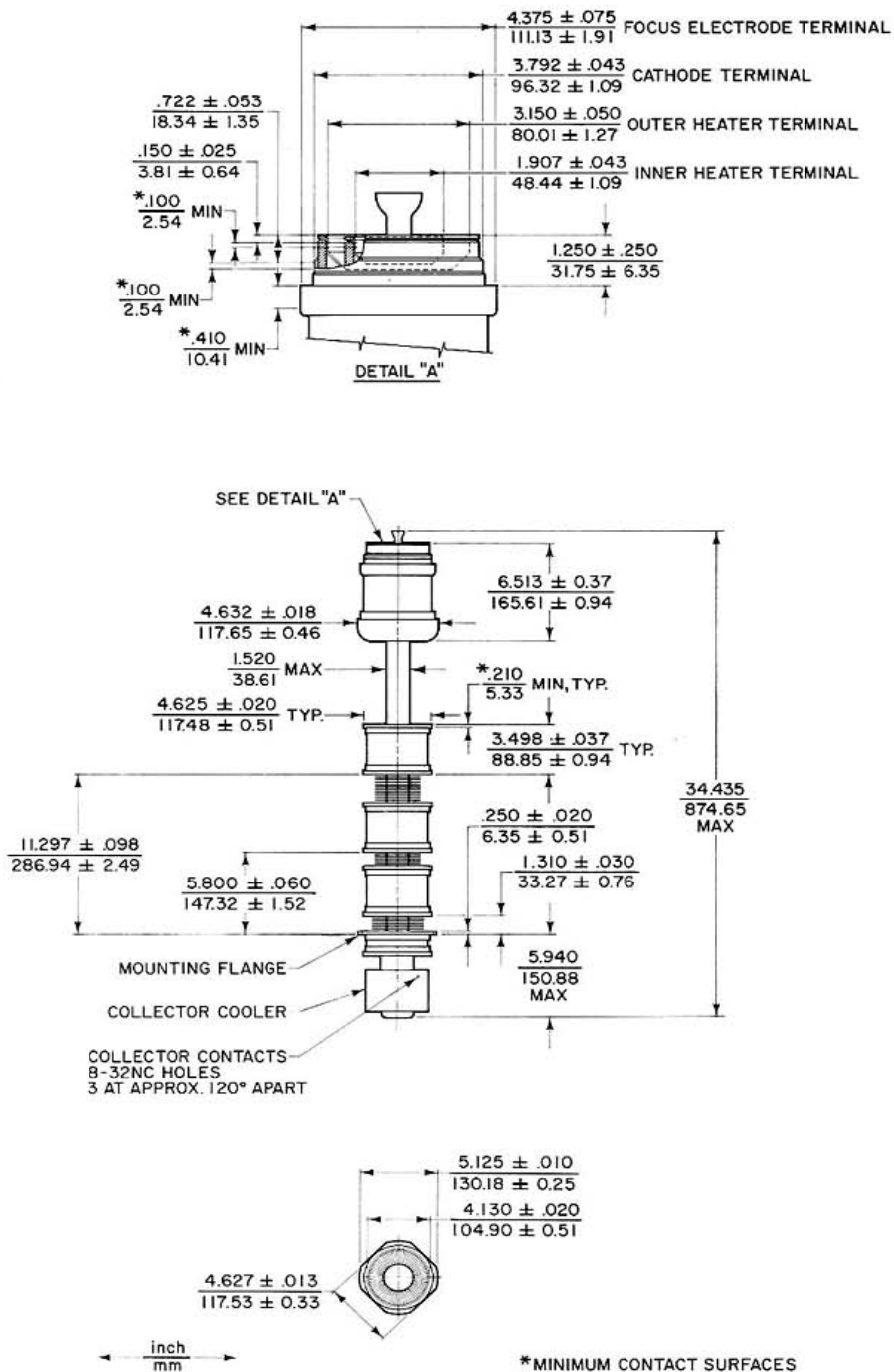
OPERATING HAZARDS

erly 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.

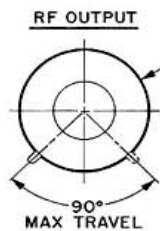
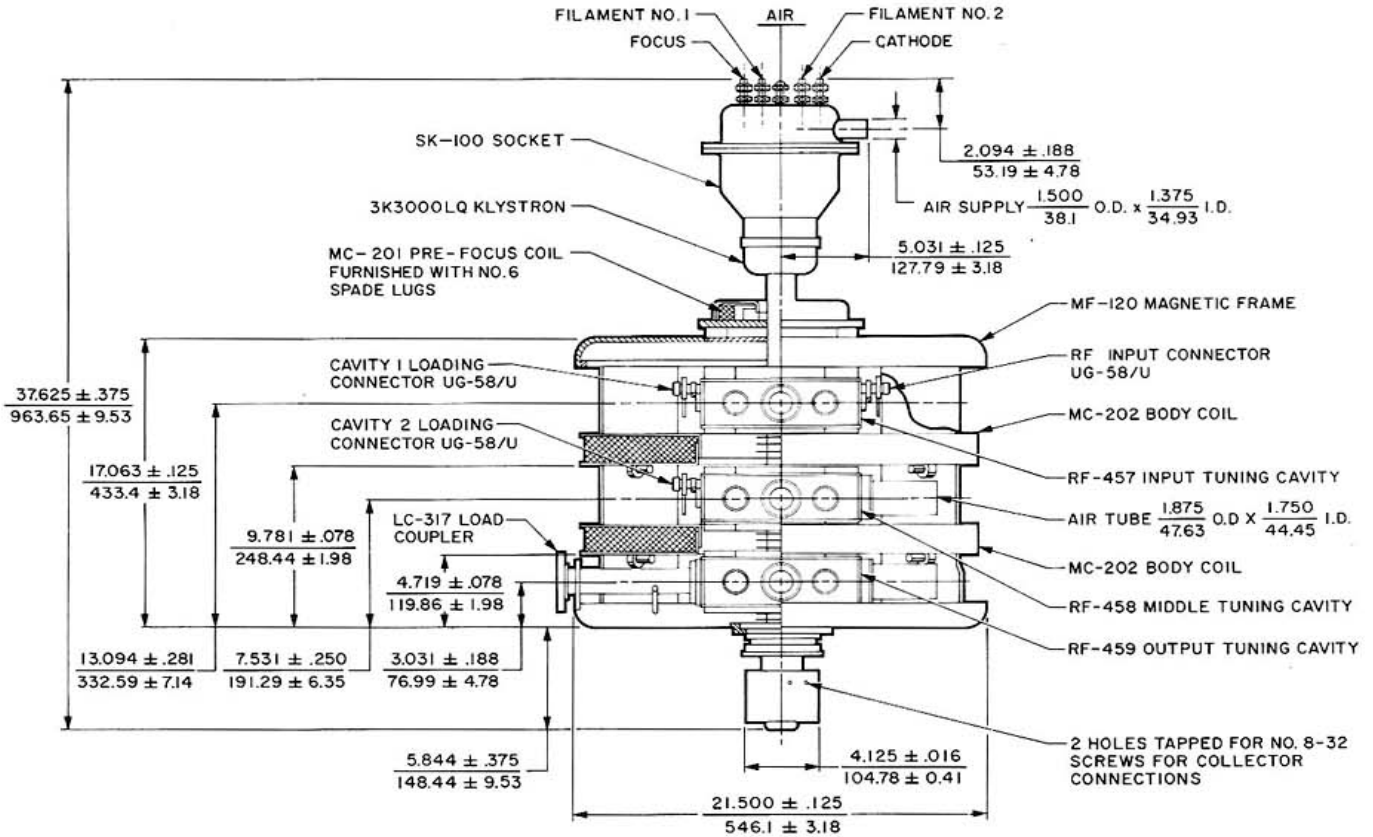
Equipment must be designed to fully safeguard all personnel from these hazards. Labels and caution notices must be provided on equipment and in manuals clearly warning of those hazards which cannot be avoided.

OUTLINE DRAWING



3K3000LQ

OUTLINE DRAWING

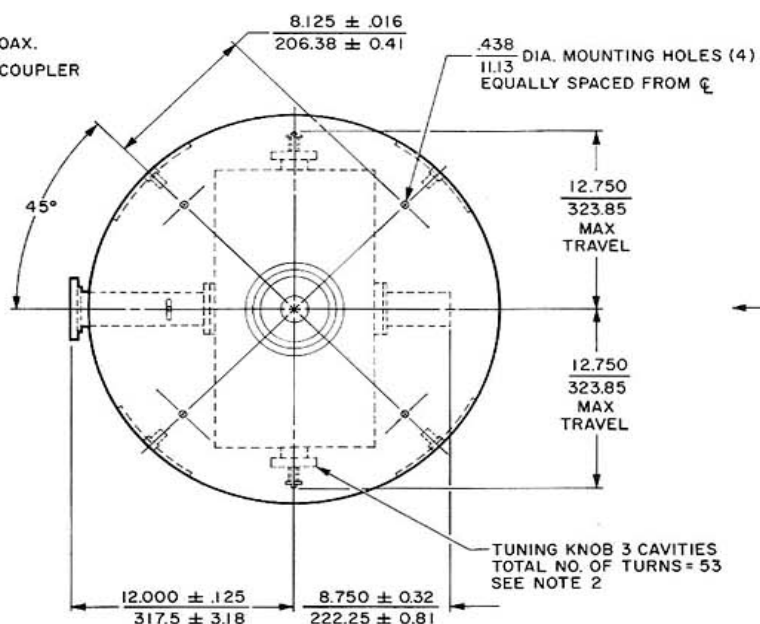


NOTES:

1. BODY COILS FURNISHED WITH SCREW LUGS & NO. 10 SCREWS
2. THE MAX TORQUE REQUIRED TO START & DRIVE EACH TUNING DOOR THRU THE ENTIRE RANGE SHALL BE 7.8 INCH-LBS
3. CUSTOMER MOUNTING BASE MUST HAVE
 $\frac{6.000}{152.4}$ MIN DIA CLEARANCE HOLE

PART NOT SHOWN:

HT-101 EXTENSION WRENCH-I REQUIRED



3K3000LQ IN H-124 CIRCUIT ASSEMBLY