

DESCRIPTION

The 3KM3000LA is a three-cavity, externally-tuned klystron amplifier for use in van-mounted, shipboard or land-based tropo-scatter communication networks and high-power radar systems. This tube delivers a CW output of at least 1 kilowatt over its tunable frequency range of 385 to 585 megahertz. Between 400 and 450 megahertz, the tube can be pulse operated and supply an output of 12 kilowatts or more. An integral modulating anode is provided for amplitude or pulse modulation as well as protection against internal arcs when connected to the beam supply through an appropriate size resistor. The external cavities permit an unlimited number of tuning cycles without damaging the vacuum seals. The 3KM3000LA operates within the H-120 or H-205 R-F Circuit Assembly, which includes the focusing electromagnets, tunable cavities, adjustable output load couplers and an SK-100 Air System Socket.

MAXIMUM RATINGS¹

Beam Voltage, pulsed operation	20 kVdc
Beam Voltage, CW operation	9 kVdc
Beam Current, pulsed operation	2.8 A
Beam Current, CW operation	750 mA dc.
Body Current	75 mA dc
Collector Dissipation	3 kW
Heater Surge Current	62 A
Focus Electrode Voltage	-500 Vdc
Load VSWR	2:1

GENERAL CHARACTERISTICS²

ELECTRICAL³

Frequency Range, CW	385 to 585 MHz
Frequency Range, Pulse	400 to 450 MHz
Heater Voltage	5.0 ± 0.25 V
Heater Current, typical	31 A
Heater Warm-Up Time, minimum ...	5 min
Focusing ⁴	Electromagnet

PHYSICAL

Dimensions	See Outline Drawings
Weight, approximate	
3KM3000LA	46 lb
H-120 Circuit Assembly	570 lb
H-205 Circuit Assembly	600 lb
Mounting Position	Vertical, cathode-up
Cooling	Forced Air
Connectors	See Outline Drawings



TYPICAL OPERATING CONDITIONS ²

PULSED OPERATION

Narrowband
Tuned

Frequency	400 MHz
Peak Power Output	12.25 kW
Drive Power	10 W
Gain	30.9 dB
Duty	0.6
Beam Voltage	15 kVdc
Peak Beam Current	1.74 A
Peak Collector Current	1.64 A
Peak Modulating Anode Voltage ...	15 kV
Peak Body Current	100 mA
Focus-Electrode Voltage	0 V
Efficiency, peak	47 %
Focus Coil Currents	
Prefocus	1.0 Adc
1st Body	2.7 Adc
2nd Body	2.7 Adc
Collector	1.5 Adc

COOLING

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

Air Flow	Pressure Drop
(ft ³ /min)	(in.-H ₂ O)

Cathode (with SK-110

Air System Socket) ...	5	0.4
Output Cavity	50	1.0
Collector	150	1.6

TYPICAL OPERATING CONDITIONS ²

CW OPERATION

Narrowband
Tuned Broadband
 Tuned

Frequency	520	520	400 MHz
Power Output	0.9	2.3	1.47 kW
Drive Power	1	2	3 W
Gain	29.5	30.0	26.9 dB
Bandwidth, 3-dB	0.6	0.8	3.5 MHz
Efficiency	40.5	43	28 %
Body Current	25	40	30 mAdc
Beam Voltage	6	9	9 kVdc
Beam Current	370	590	590 mAdc
Focus-Electrode			
Voltage	-200	-200	-200 Vdc
Cavity 2 Loading	---	---	40 W
Focus-Coil Currents			
Prefocus	0.65	0.7	0.7 Adc
1st Body	2	2	2 Adc
2nd Body	1.1	1.6	1.5 Adc
Collector	1	1	1 Adc

ELECTROMAGNET

Prefocus Coil, maximum

Voltage	25 Vdc
Current	1.25 Adc

Body Coils 2 and 3, maximum

Voltage	175 Vdc
Current	3 Adc

Collector Coil, maximum

Voltage	50 Vdc
Current	1.5 Adc

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 condensers 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.

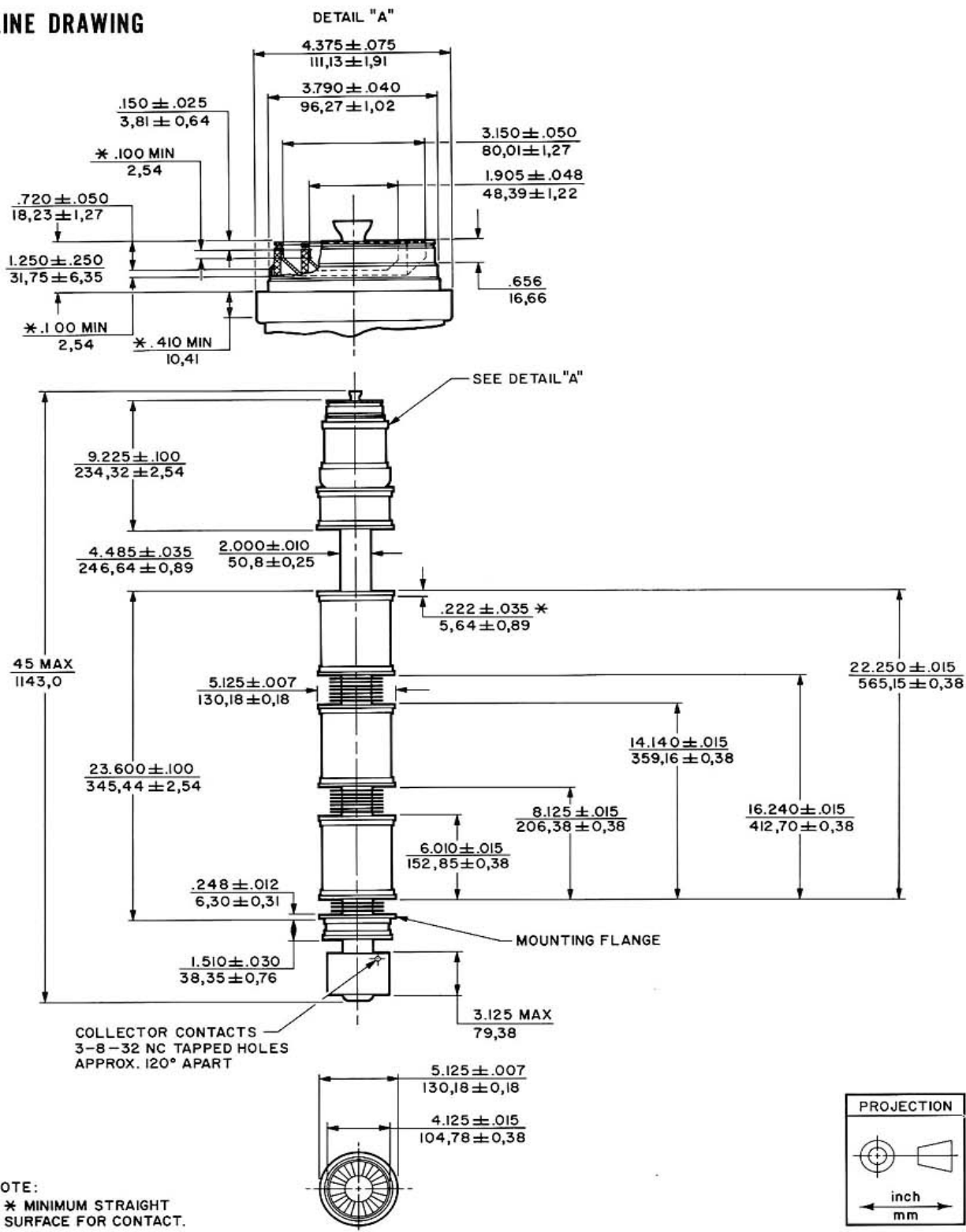
NOTES:

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. 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.

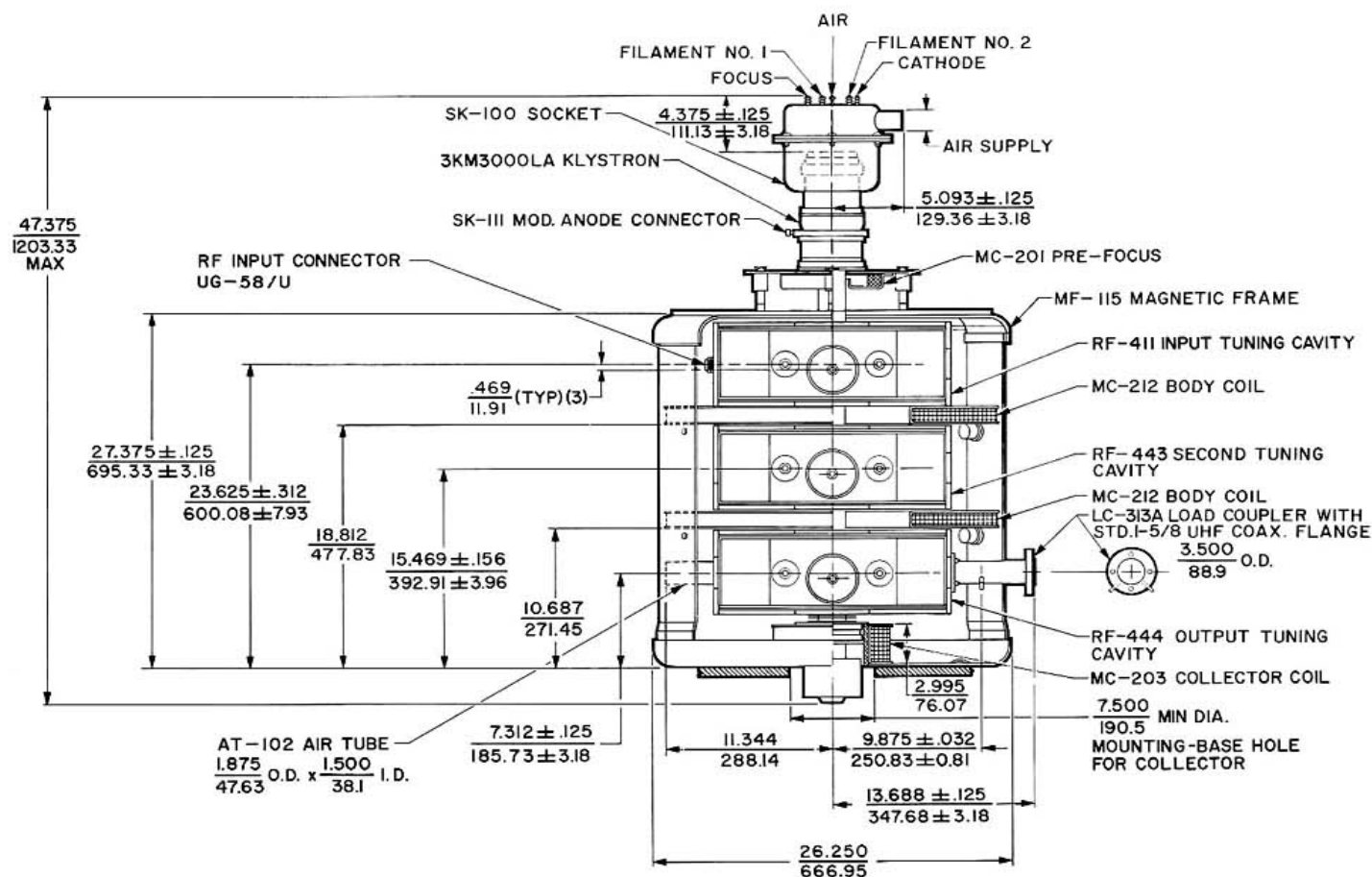
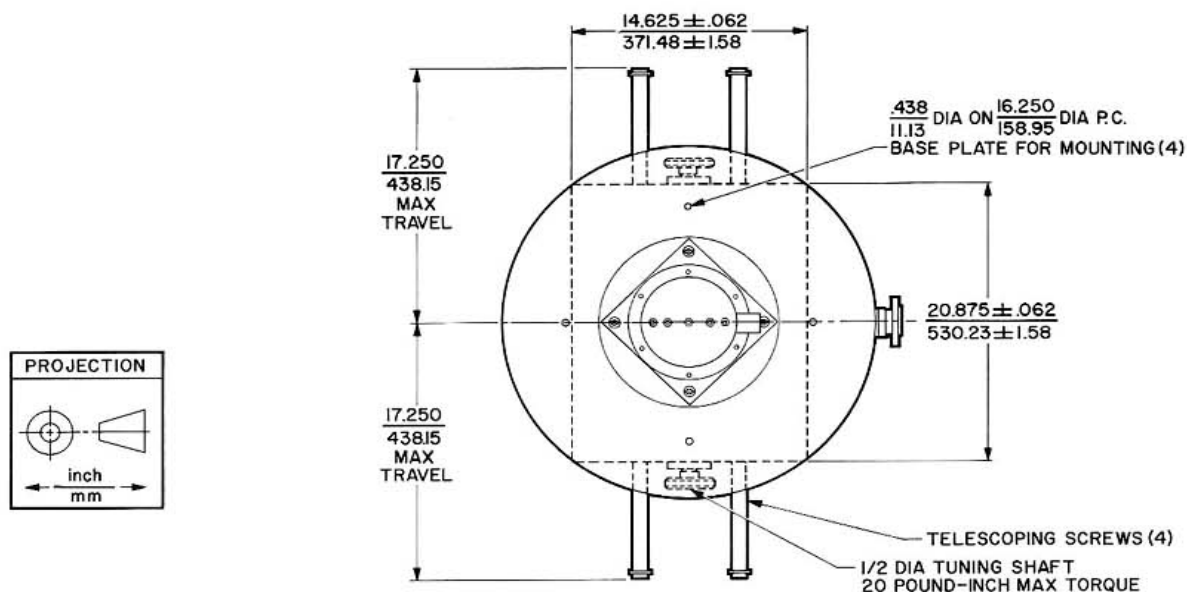
3. To protect against internal arcs, a 10,000-ohm, 100-watt resistor should be connected between the modulating anode and the beam supply.
4. The H-120 R-F Circuit Assembly is recommended for fixed-station systems. The H-205 R-F Circuit Assembly is recommended for van-mounted or shipboard systems.

OUTLINE DRAWING



OUTLINE DRAWING

3KM3000LA IN H-120 CIRCUIT ASSEMBLY



OUTLINE DRAWING 3KM3000LA IN H-205 CIRCUIT ASSEMBLY

