



varian
palo alto tube division

TECHNICAL DATA

5K70SH-1

CW KLYSTRON
AMPLIFIER

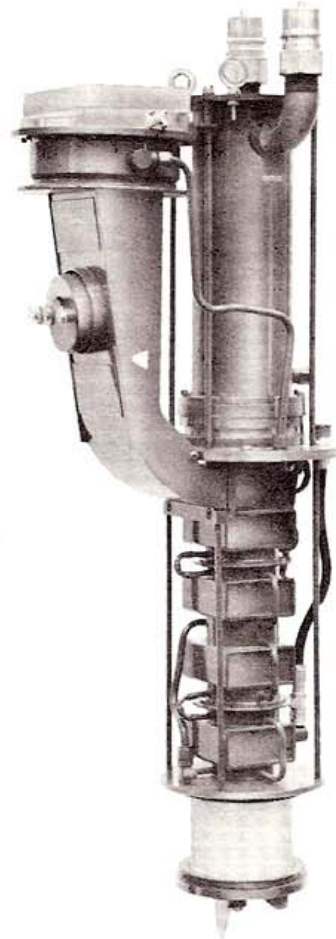
30 kW

DESCRIPTION

The 5K70SH-1 is a fixed-tuned, five-cavity klystron amplifier for use in industrial microwave heating equipment. The tube delivers a CW output of at least 30 kilowatts at 2.45 gigahertz. Gain of 50 dB or more at greater than 50 per cent efficiency minimizes power supply requirements. An extra large cathode assures long tube life. The 5K70SH-1 is electromagnetically focused and the klystron and electromagnet are liquid cooled.

MAXIMUM RATINGS¹

Beam Voltage	23 kVdc
Beam Current	3 Adc
Body Current	100 mAdc
Collector Dissipation	70 kW
Hydrostatic Pressure	125 psig
Coolant Outlet Temperature	80 °C
Load VSWR	3:1



GENERAL CHARACTERISTICS²

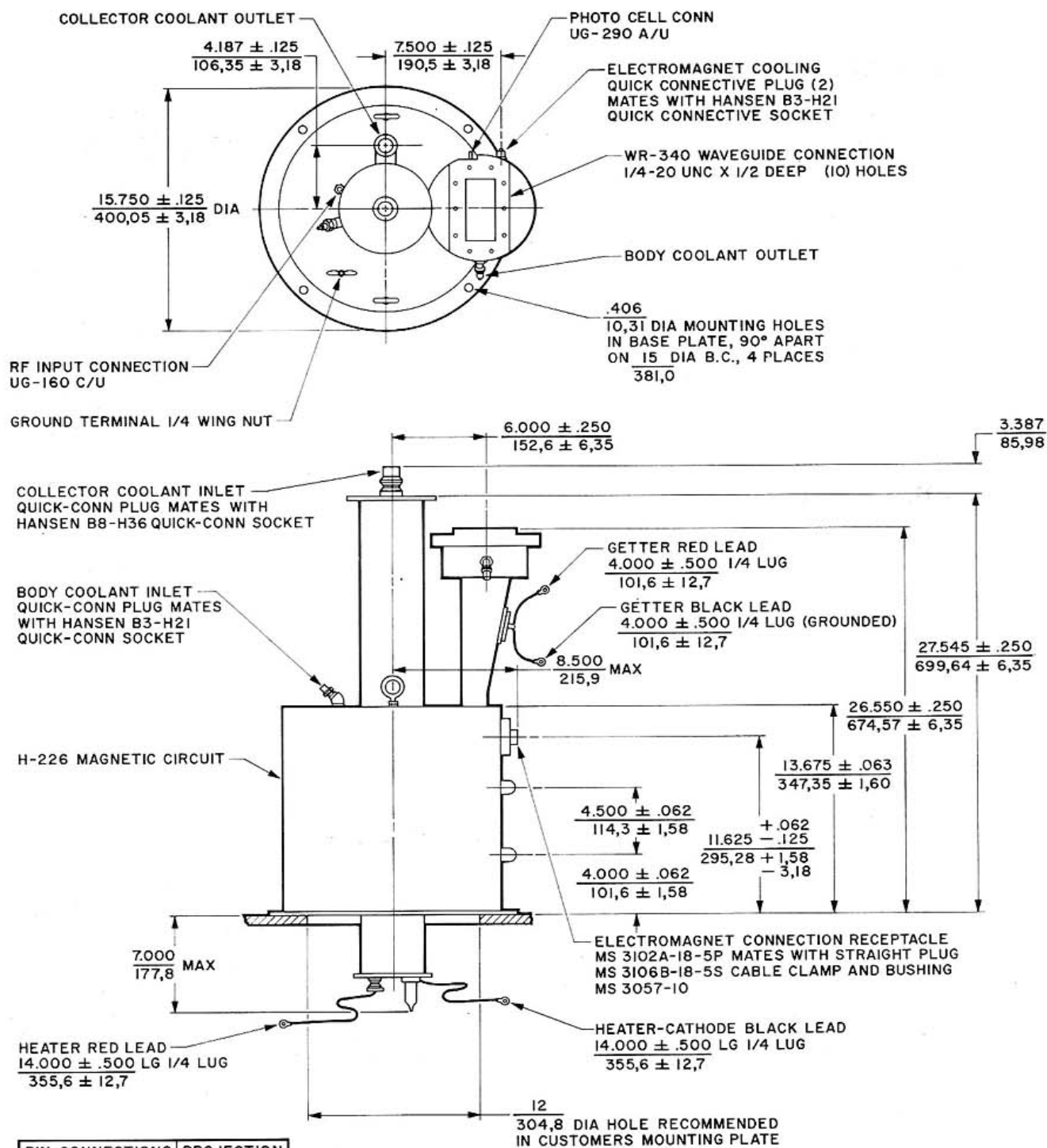
ELECTRICAL

Frequency	2.45 GHz
Power Output, minimum	30 kW
Heater Voltage	7.50 ± 0.38 Vac
Heater Current, typical	11.5 Aac
Heater Warm-up Time	5 min
Getter Voltage	4 Vac
Getter Current	24 Aac
Beam Voltage Modulation	0.0935 °/V
Electromagnet Voltage, max	150 Vdc
Electromagnet Current, max	25 Adc

PHYSICAL

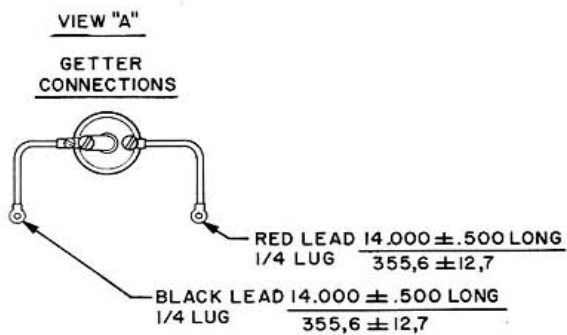
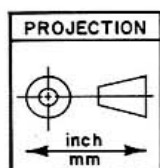
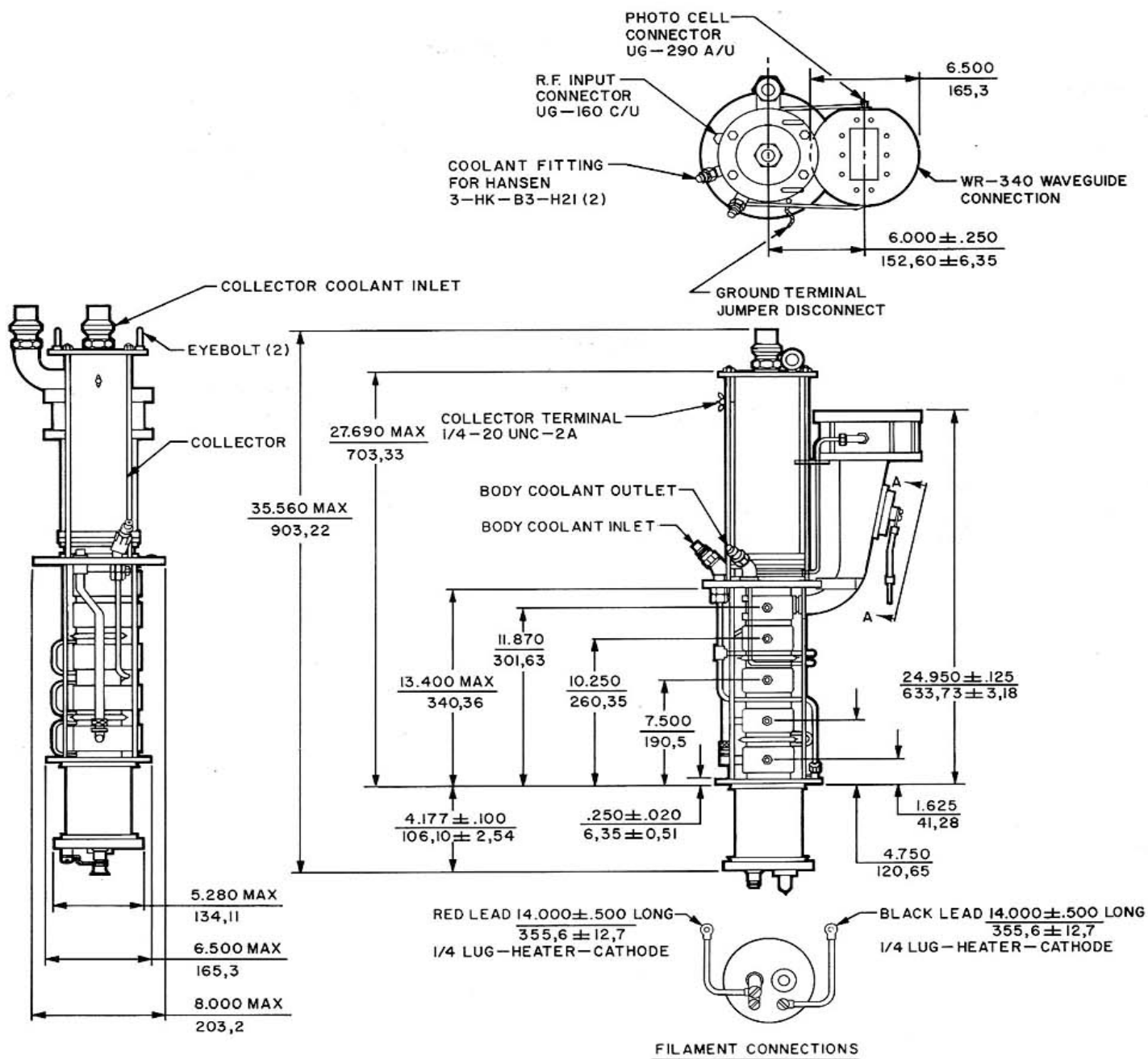
Dimensions	See Outline Drawing
Weight, approximate	
Tube	100 lb
H-226 Electromagnet	186 lb
Mounting Position	Any
Cooling	Liquid and Forced-Air
Connectors	See Outline Drawing

OUTLINE DRAWING



PIN CONNECTIONS		PROJECTION
A	(NC)	
B	+	
C	-	

OUTLINE DRAWING



TYPICAL OPERATING CONDITIONS²

Frequency	2.45 GHz	Beam Current	2.66 Adc
Power Output	31.5 kW	Body Current	50 mAdc
Drive Power	100 mW	Efficiency	52.5 %
Gain	55 dB	Electromagnet Current	16.5 Adc
Beam Voltage	22.5 kVdc		

COOLING

The tube and electromagnet require a cooling system capable of dissipating about 70 kilowatts. Distilled water is the preferred coolant. Metals in the circulating system should be close to copper in the galvanic series. Maximum coolant outlet temperature of 80 °C is for cooling systems operating at atmospheric pressure at sea

level. In addition, a forced-air flow of 20 ft³/min should be directed at the cathode ceramic-to-metal seals. For different coolants or operating conditions, contact the nearest Varian Sales Office or the Palo Alto Tube Division for recommendations.

Water Flow, min

Collector	18.0 gal/min
Body	0.8 gal/min
H-226 Electromagnet	2.0 gal/min

Pressure Drop, at min flow

Collector	30 lbf/in ²
Body	50 lbf/in ²
H-226 Electromagnet	30 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. 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.