from JETEC release #1495, July 11, 1955

VARIAN associates

REFLEX KLYSTRON

DATA SHEET

oscillator

VA-6312*

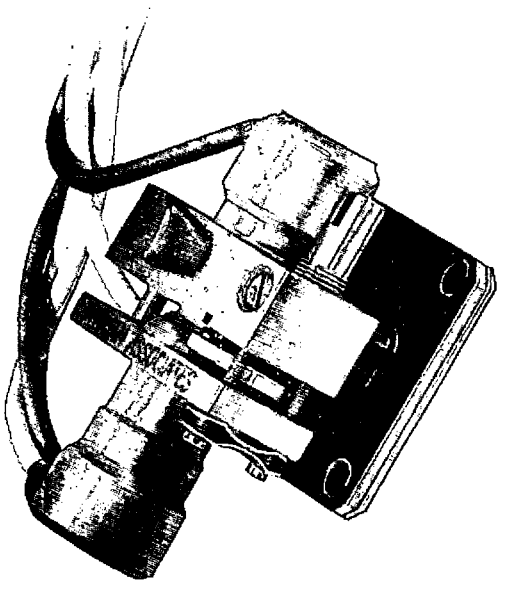
8.5 - 10.0 kMc

APPLICATION

The VA-6312 is intended for radar application particularly under rugged service conditions. It will operate from conventional power supplies and with conventional crystal mixers, greatly increasing the ruggedness and reliability of any radar system to which it may be applied. It will produce adequate power output and electronic tuning range with resonator voltage as low as 200 volts.

FEATURES

Low microphonics . . . Negligible barometric frequency coefficient . . . Matched load operation without matching sections . . . Waveguide output . . . Linear reflector voltage tracking . . . Rapid warm-up . . . Removable inserts in flange holes simplify insulation when required . . . Molded leads and base permitting high altitude operation without pressurization.



GENERAL CHARACTERISTICS

Frequency Range	8.5 to 10 kMc
Heater Voltage	6.3 volts
Heater Current	1.2 A

MECHANICAL CHARACTERISTICS

Cathode	Oxide coated, unipotential
Maximum Dimensions	3 x 1⅞ x 1¾ in.
Weight	7 oz
Output Connector	Bolts to UG-39/U flange or UG-40A/U choke for 1 x 0.50 x 0.050 in. waveguide
Base	Molded, flexible leads, 18 inches long
Mounting Position	Any
Cooling	Convection [1]
Tuner	Single screw tuner [2]

MAXIMUM RATINGS

Resonator Voltage	350 volts
Resonator Current	42 mA
Reflector Voltage	0 to −1000 volts

ELECTRICAL CHARACTERISTICS

Operation between 8500 and 10,000 Mc, matched load, Ef = 6.3 volts

Resonator Voltage = 300 volts	Mode 5¾			
	Min.	*Avg.*	*Max.*	
Resonator Current	20	28	32	mA
Reflector Voltage (at 9.3 kMc)	....	−160	.....	volts
Power Output	25	70	.....	mW
Electronic Tuning Range[3]	30	40	.....	Mc
Modulation Sensitivity	.....	1.5	.....	Mc/V
Temperature Coefficient	0	−60	−200	kc/°C
Shock, 200G, ΔF	.....	2	5	Mc
Vibration, 10G, 50 to 600 Cycles, FM (p-p)	.....	.5	4	Mc
Tuner Torque	.....	2	4	in-lbs
Mechanical Tuning Rate	1.8	2.0	3	Mc/°
Warm-Up Time[4]	.....	15	.....	sec

NOTES:

1. Forced-air cooling required above 10 watts resonator power input.
2. Approximately 2 turns to cover frequency range. Positive mechanical stops are provided.
3. Between half-power points.
4. Before oscillation begins.

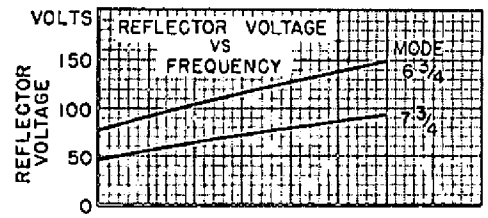
* Formerly designated VA-6312/V-270

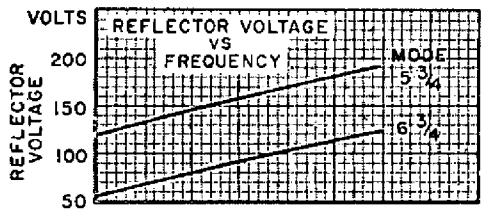
Additional operation and application information available upon request.

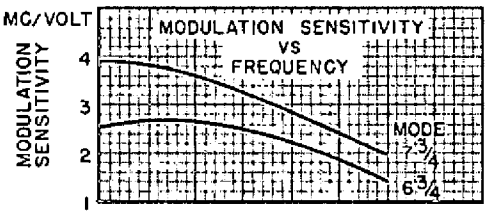
VA-6312

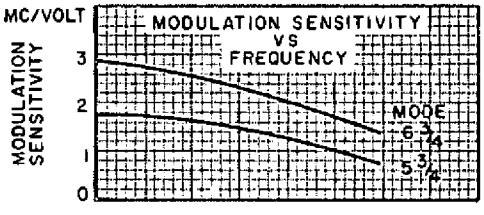
ALL CURVES ARE TYPICAL DATA

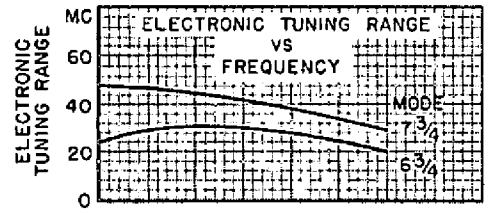
RESONATOR VOLTAGE = 200 V VSWR <1.1 RESONATOR VOLTAGE = 300 V

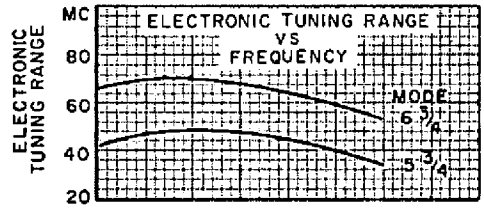


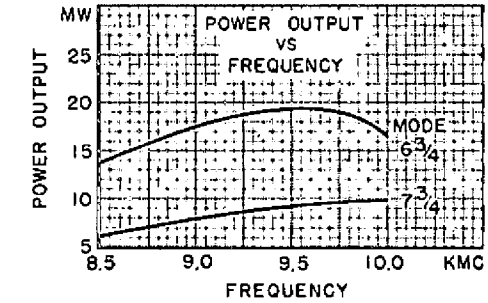




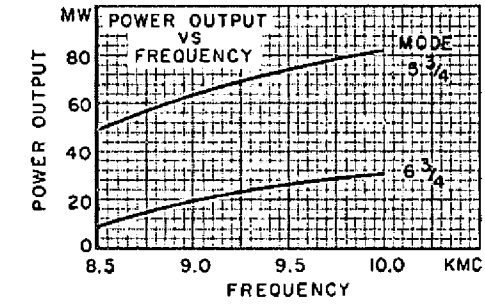








E_{RS} = 200 VOLTS



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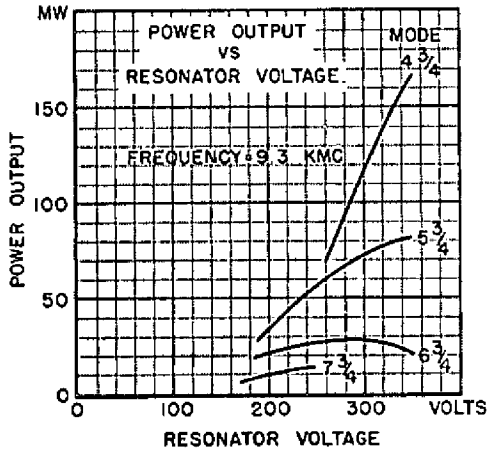

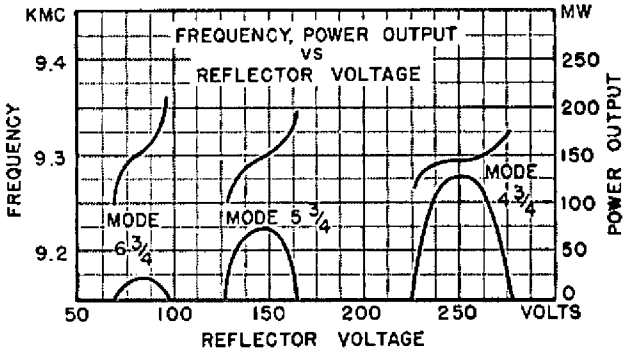

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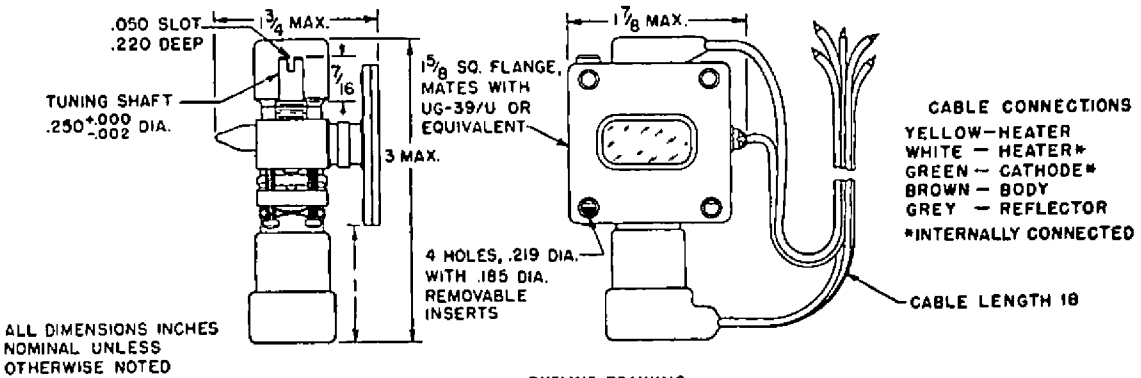


OUTLINE DRAWING
VA-6312 REFLEX KLYSTRON

DWG. 270A
RE. 3-11-E.

Pub. 84A Printed in USA 3M455

VARIAN associates

SPECIFICATION
TYPE VA-6312/V-270 REFLEX KLYSTRON

Description: Klystron, Integral Cavity, Tuner, Waveguide Output

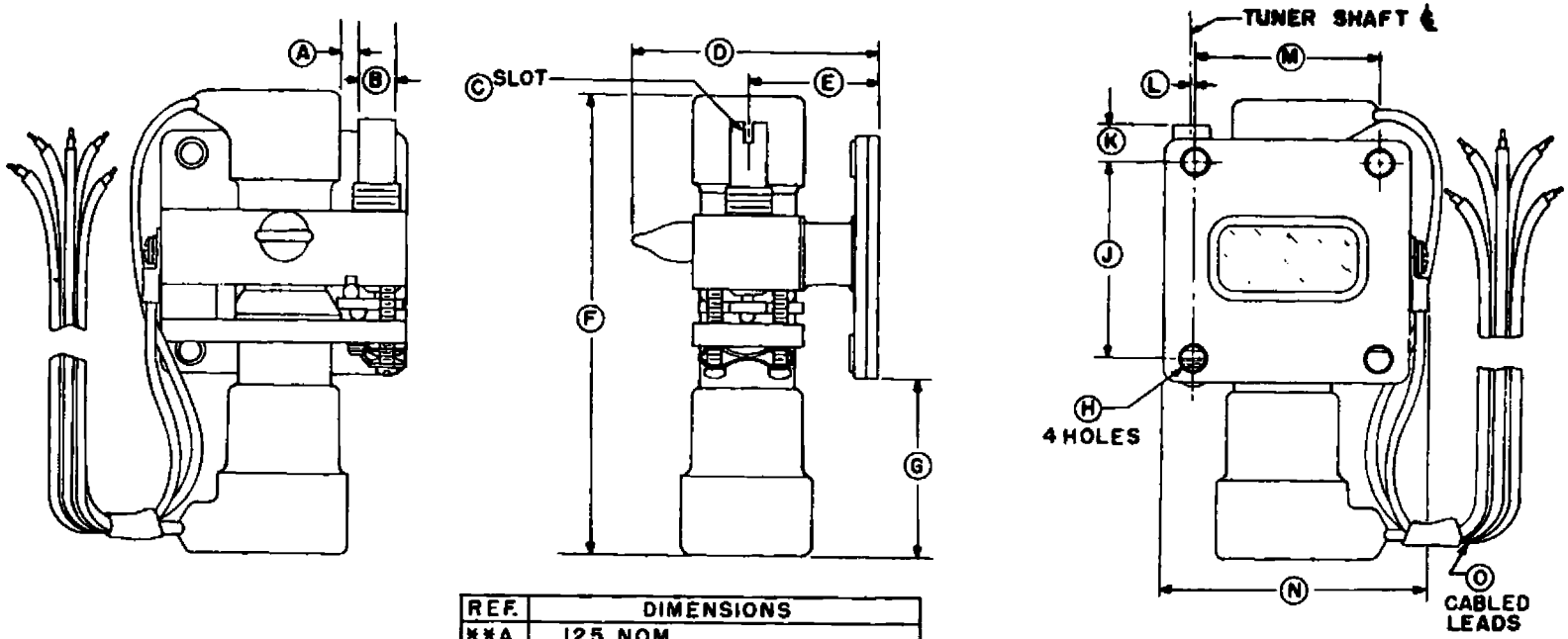
Ratings:	Ef	Ers	Er	Irs	F	Alt.	Tuner Plate Temp.
Absolute Maximum:	6.3 ± 10% v	350 Vdc	0 to -1000 Vdc	42 mAdc	-- Mc	No Limit ft	200 °C
Test Cond:	6.3	300	-55 to -225	-- 9300±.3%	--	--	Note 1.

**Base: Molded; color coded leads

**Cathode: Coated Unipotential

Ref.	Test	Conditions		Min.	Max.	
3.1	Qualification Approval:	Required for JAN markings				
4.5	Holding Period:	t=168 hours				
4.9.7	**Moisture-Vaporproof Pack:					
4.9.18	*Carton Drop:	(d)Package Group 1 Carton Size N				
4.9.2	*Dimensions:	See Outline Drawing				
4.9.19	**Vibration(1):	Test Cond; Er(Mode 5)/max Po; G=10; F=50 to 600 cps; t=5 min	△F (p-p):	--	4	Mc
4.9.19	Vibration(2):	Test Cond; G=10; F=60; t=2 min; Note 2	Ir:	0	10	uAdc
--	**Shock:	Test Cond; Er(Mode 5)/max Po; G=200; Shock duration=0.001 sec; Note 3	△F:	--	5	Mc
4.10.8	*Heater Current:	Test Cond.	If:	1.08	1.32	A
4.10.6.7.1	⚡Total Reflector Current:	Test Cond; Notes 4 & 5	Ir:	--	3	uAdc
4.10.1.1	⚡Emission:	Test Cond; Ef=5.7 v; Note 5	△Ik/Ik:	--	-15	%
--	Resonator Current:	Test Cond; Er(Mode 5)/max Po	Irs:	20	32	mAdc

Ref.	Test	Conditions		Min.	Max.	
4.10.7.3.2	Mechanical Tuning Range:	Test Cond; Er(Mode 5)/max Po	F:	8500	10,000 Mc	
4.15.1	Power Output(1):	Test Cond; Er(Mode 5)/max Po	Po:	25	--	mW
4.15.1	*Power Output(2):	Test Cond; Er(Mode 5)/max Po; F=8500+.3% Mc; F=10,000 ± .3% Mc	Po:	25	--	mW
4.15.1	**Power Output(3):	Test Cond; Er(Mode 5)/max Po; F=8500 through 10,000 Mc	Po:	25	--	mW
4.10.5.4	Reflector Voltage(1):	Test Cond; Er(Mode 5)/max Po	Er:	-110	-195	Vdc
4.10.5.4	*Reflector Voltage(2):	Test Cond; Er(Mode 5)/max Po; F=8500 ± .3% Mc	Er:	-85	-135	Vdc
		F=10,000 ± .3% Mc	Er:	-160	-225	Vdc
4.15.3	*Electronic Tuning Range(1):	Test Cond; Er(Mode 5)/50% max Po	ΔF:	30	--	Mc
4.15.3	**Electronic Tuning Range(2):	Test Cond; Er(Mode 5)/50% max Po; F=8500 to 10,000 Mc	ΔF:	30	--	Mc
4.15.7	*Hysteresis:	Test Cond; Er(Mode 5)/max Po; Note 6	ratio:	--	0.5	
4.15.5	**Temperature Coefficient:	Test Cond; Er(Mode 5)/max Po; TA=20°C to 60°C	Coeff:	0.0	-.20	Mc/°C
--	**Frequency Modulation:	Test Cond; Er(Mode 5)/max Po; Ef=5.7 to 7.0 Vdc	ΔF:	--	.1	Mc
--	**Low Pressure:	Test Cond; Er(Mode 5)/max Po; t=10 sec; Note 7	ΔF:	--	2	Mc
4.15.1.1	Frequency Pulling:	Test Cond; Er(Mode 5)/max Po; δ = 8db min; Note 8				
--	**Heater Voltage Coefficient:	Test Cond; Er=5.7 to 7.0 V	ΔF/ΔEf:	--	6	Mc/v



CABLE CONNECTIONS

YELLOW – HEATER
WHITE – HEATER } INTERNALLY
GREEN – CATHODE } CONNECTED
GREY – REFLECTOR
BROWN – BODY

REF.	DIMENSIONS
**A	.125 NOM.
*B	.250 MAX. .248 MIN.
*C	.050 WIDE X .220 DEEP NOM.
D	1.75 MAX.
*E	.936 MAX. .850 MIN.
*F	3.000 MAX.
**G	1.00 MAX.
*H	219 DIA. NOM. WITH .185 DIA. NOM. REMOVABLE INSERTS
J	1.284 MAX. 1.276 MIN.
**K	.260 MAX.
*L	.070 MAX. .010 MIN.
M	1.224 MAX. 1.216 MIN.
**N	1.875 MAX.
*O	18 NOM.

NOTE: Eyelet-type inserts in the flange mounting holes are 0.219 O.D., 0.185 I.D., nominal, and are easily removable from rear of flange. With inserts in place, the mounting holes provide clearance for #8 screws. With inserts removed, the mounting holes permit use of insulating bushings where d-c isolation between tube flange and waveguide system is desired.

SPECIFICATION DRAWING VA-6312/V-270 REFLEX KLYSTRON

Dwg. 270C
9-30-54