Ferranti

SZ50

KLYSTRON

A very rugged Reflex Klystron for use as a Local Oscillator. It has been designed to provide extreme stability and reliability in operation under the most severe environmental conditions. It is intended for convection cooling with free air circulation.

PHYSICAL DATA.

Dimensions	See Drawings on Page 3.
Output Connection	Bolts to UG-39/U flange or UG-40A/U choke for W.G.16
Mounting Position	Any
Weight	6 oz. (180 gm.) approx.
Electrode Connections	Moulded flying leads.

FREQUENCY.

Operating Range	9300±300 Mc/s

TUNING.

A single screw tuner covers the tuning frequency range in approximately 2¼ turns. For tuner screw settings see the graph on page 5. The average tuner torque is 35 in./oz. (max. 50 in./oz.).

HEATER.

Heater Voltage	6·3 volts
Heater Current	1·2±10% amps

RATINGS. (All ratings are 'Absolute')

Max. Heater Voltage	6·9 volts
Min. Heater Voltage	5·7 volts
Max. Resonator Voltage	350 volts
Max. Resonator Current	60 mA
Max. Neg. Reflector Voltage	500 volts
Max. Vibration	20 g
Max. Shock (short duration)	150 g
Max. Altitude for operation	60,000 ft
*Max. Body Temperature	200 °C
Max. V_{h-k}	55 volts

CHARACTERISTICS AND TYPICAL OPERATION.

Frequency Range		9300±300	Mc/s
Heater Voltage		6·3	volts
Load		Matched-V.S.W.R. <1·1	
Resonator Voltage		250	volts
	Min.	Max.	
†Reflector Voltage	−75	−120	volts
Resonator Current	20	40	mA
Reflector Current	–	5	μA
Power Output	29	66	mW
‡Electronic Tuning Range	±15	–	Mc/s
Electronic Tuning Tracking Error	–	5	Mc/s
§Electronic Tuning Rate	1·3	4·3	Mc/s / volt
Temperature Coefficient	+50	−100	kc/s / °C
Warm-up Frequency Drift	–	10	Mc/s
Heater Voltage Coefficient	–	1·5	Mc/s / volt
Hysteresis	–	50	%

*Reliability will be seriously impaired if this temperature is exceeded.

†See Graph on Page 4.

‡Measured at half power point.

§At mode peak.

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CHARACTERISTICS AND TYPICAL OPERATION (cont.)

*Tuner Resetting Accuracy (max. ΔF.)	...	...	...	...		2 Mc/s
†Pressure Coefficient (Max. ΔF.)	...	...	...	...	...	$\pm\frac{3}{4}$ Mc/s

Vibration.

The max. peak to peak frequency variation from vibration of 100 c/s to 4 kc/s at 10g peak to peak is 0·2 Mc/s. ‡

Shock.

The maximum frequency deviation due to shock of 100g. is 2·0 Mc/s.

NOTES ON OPERATION.

Mounting.

The klystron should be securely bolted to the mating waveguide flange. Normally the anode (tube body) is operated at earth potential; when operated with the anode above earth potential suitable insulation should be provided between the tube and waveguide flanges. §

Installation.

It is important that the circuit in which a new klystron is being installed is thoroughly checked before the application of any voltages.

Applied Voltages.

The applied voltages should not exceed the maximum published ratings under any circumstances. All quoted voltages are relative to the cathode.

Tuning.

Anti-clockwise rotation of the tuner screw increases frequency.

Heater Voltage.

Life and reliability are directly related to the deviation of the heater voltage from its centre rated frequency. Under no circumstances should it deviate by more than ±10%.

Reflector Voltage.

The Reflector must always be operated at a potential which is negative with respect to that of the cathode, and its power supply should not be disconnected during the time the resonator voltage is applied. When the reflector voltage is modulated, the magnitude of the modulating voltage must be limited to the extent necessary to prevent positive excursions of the reflector voltage. When there is any possibility of the reflector voltage becoming equal to or more positive than the cathode a protective diode should be connected between the reflector and cathode. The performance of this diode should be checked regularly as it will normally be operated at zero current drain, an operating condition which materially reduces the life.

Load.

For correct functioning over the specified frequency band and also from 8500 Mc/s. to 9000 Mc/s., the load should present a V.S.W.R. of not more than 1·2 to the valve. Outside the range 8500 to 9600 Mc/s but within the frequency range of 7800 to 10500 Mc/s the load should present a V.S.W.R. of less than 1·5.

Life.

The guaranteed life under normal operating conditions is 500 hours. An average life of 1000 hours is a 95% expectancy. The life expectancy will be appreciably reduced if the valve is operated under conditions where specified maximum ratings are exceeded. See also the note on 'Heater Voltage' above.

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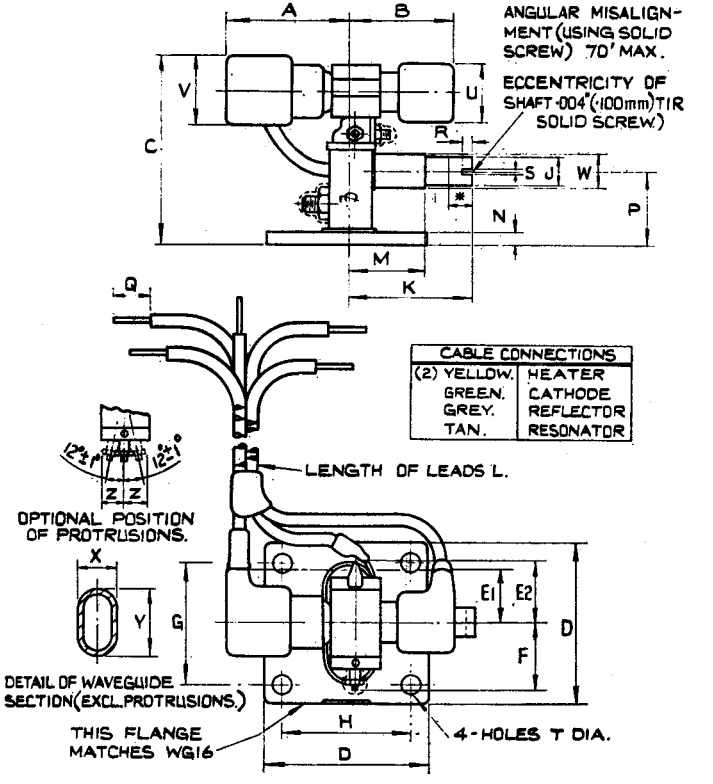
*Resetting accuracy defines the frequency deviation which can result from turning the tuner screw through approximately half a turn in either direction, then returning it to its original position.

†The frequency deviation measured when the atmosphere pressure surrounding the valve and inside the set and cavity is increased from 1/10th atmosphere to 1 atmosphere in 1 minute (max.).

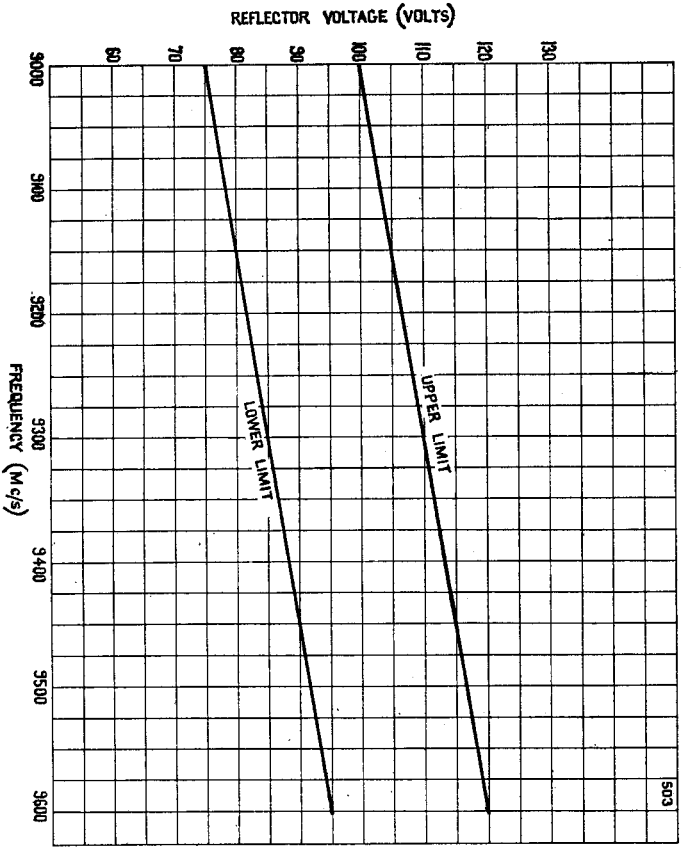
‡The valve is design tested to 20g.

§To facilitate insulated mounting the eyelets in the fixing bolt holes are removable.

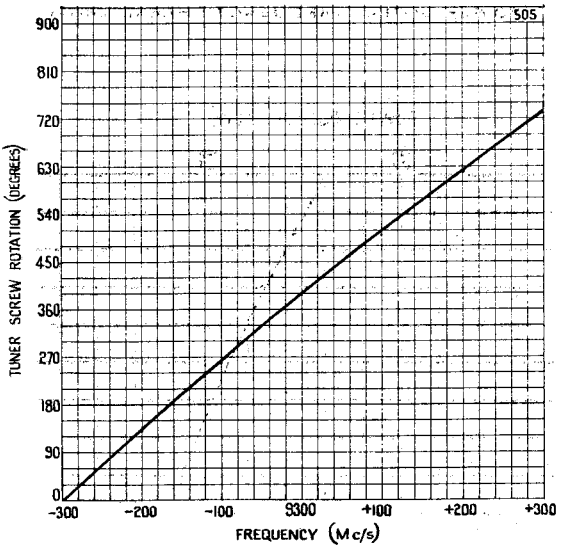


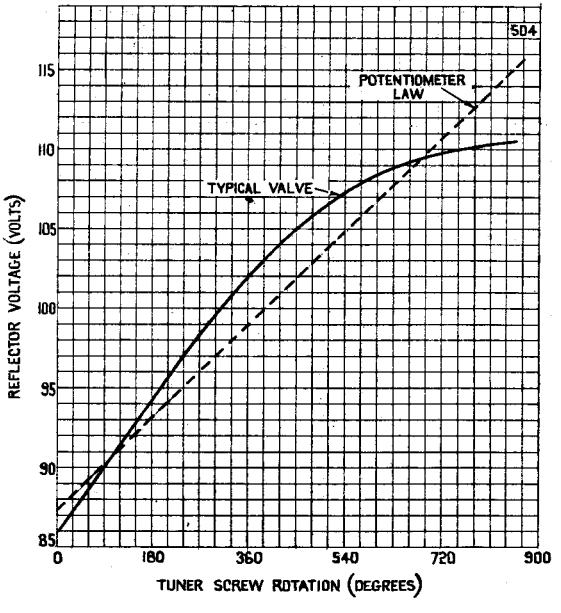
DIM	INCHES	m.m.	NOTES.	DIM	INCHES	m.m.	NOTES.
A	1·260 MAX.	32		N	·125 +·025 −·050	3·17 +·63 −1·27	
B	1·026 MAX.	25·56		P	·720 ± ·002	18·29 ± ·05	
C	1·900 MAX.	48·25		Q	·375 ± ·125	9·52 ± 3·18	
D	1·625 ± ·015	41·25 ± ·40		R	·100	2·54	
E1	·680 MAX.	17·27		S	·040	1·02	
E2	·725	18·42	MAX. BODY WIDTH	T	·219 ± ·003	5·55 ± ·08	EXCLUDING ·195 INSERTS.
F	·625 MAX.	15·87	EXCL. GROUND TAG	U	·600 MAX.	15·25	
G	1·220 ± ·004	31 ± ·10		V	·750 MAX.	19·05	
H	1·280 ± ·004	32·51 ± ·10		W	·360 MAX.	9·13	
J	·281 +·002 −·002	7·14 +·00 −·05	* DIA. OVER ·200" (5mm) LENGTH AT 9·6 G/s (32-34 TPI)	X	·435 MAX.	11·06	
K	1·240 ± ·060	31·50 ± 1·52		Y	1·100 MAX.	27·94	
L	18	457		Z	·240 MAX.	6·10	
M	·812	20·64					

REFLECTOR VOLTAGE/FREQUENCY CHARACTERISTIC



TUNER SCREW SETTING





POWER OUTPUT/FREQUENCY CHARACTERISTIC