F4008C CARCINOTRON

The F4008C "O" type carcinotron is a backward wave oscillator delivering an output power of 30 mW (minimum) to 300 mW over the range 7 to 11 GHz.

Amplitude modulation can be achieved by anode voltage variation. Frequency modulation is obtained by varying the line voltage. The frequency is independent of the load up to a VSWR of 3 : 1.

An integral permanent magnet insures focusing, forced air cooling insures operation in a wide temperature range.

This "O" type carcinotron, which features excellent signal to noise ratio is particularly suitable for wide frequency sweep wobbulated generator, wide dispersion spectrum analyser, radar panoramic receiver, frequency agile radar (master and local oscillator).

GENERAL CHARACTERISTICS

Electrical (1)

	min.		max.	
Heater voltage		6.3		V
Heater current	0.75		1.80	A
Grid voltage	−100		0	V
Anode voltage (2)	-		150	V
Anode current	−1		+2	mA
Line voltage at 7 GHz	300		-	V
at 11 GHz	-		1500	V
Line current	-		25	mA
— Line frequency modulation				
Modulation coefficient at 7 GHz	-		9.5	MHz/V
Modulation coefficient at 11 GHz	1.3		-	MHz/V
— Anode frequency modulation				
Modulation coefficient at 7 GHz	-		2.5	MHz/V
Modulation coefficient at 11 GHz	0.5		-	MHz/V
— Anode amplitude modulation				
Anode voltage variation for an output power variation of 6 dB - at 7 GHz	-		70	V
- at 11 GHz	15		-	V
— Power variation				
in the range 7 to 11 GHz	-		8	dB
in any 0.2 GHz bandwidth	-		1.5	dB
Grid voltage for cut-off	−100		-	V
— Interelectrode capacitances				
Anode to all other electrodes	-		30	pF
Line to all other electrodes	-		30	pF
Signal to noise ratio between 1 and 10 MHz	40		-	dB

(1) All voltages are referred to the cathode.
(2) Anode or accelerator. Line or cathode may be connected to ground, both are isolated from the focusing device.

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Mechanical

Operating position	any
RF connections	50 Ω N type UG 21/U
Weight	3. 5 kg
Focusing	permanent magnet
Power supply connections	see drawing

ABSOLUTE RATINGS
(non simultaneous values)

	min.	max.			min.	max.	
Heater voltage	6. 1	6. 5	V	Anode voltage	-	200	V
Heater surge current.	-	3. 5	A	Anode current	−1	+3	mA
Warm-up time	2	-	mn	Line voltage	-	1600	V
Grid voltage	−125	-	V	Line current	-	30	mA

Cooling

	min.	max.	
Temperature at the measurement point	-	100	°C
Air flow	-	10	dm^3/s
Air pressure	-	0. 0025	bars
Flow direction	(1)		

Environmental conditions

	min.	max.	
Vibrations from 10 to 50 Hz	-	1	mm
Acceleration at 50 Hz	-	1	g
Shocks - acceleration	-	15	g
- duration	-	11	ms
Ambient temperature			
- during operation	−40	+100	°C
- during storage	−50	+110	°C

TYPICAL OPERATION

Heater voltage	6. 3	V	Anode voltage	70	V
Heater current	1. 3	A	Anode current	0. 05	mA
Frequency	11	GHz	Grid voltage	0	V
Line voltage	1455	V	Output power	190	mW
Line current	17. 6	mA			

OPERATING INSTRUCTIONS

Application of voltages

Voltages should be applied in the following order : Heater, Grid, Line, Anode.
They should be removed in the reverse order from start up.

Supply

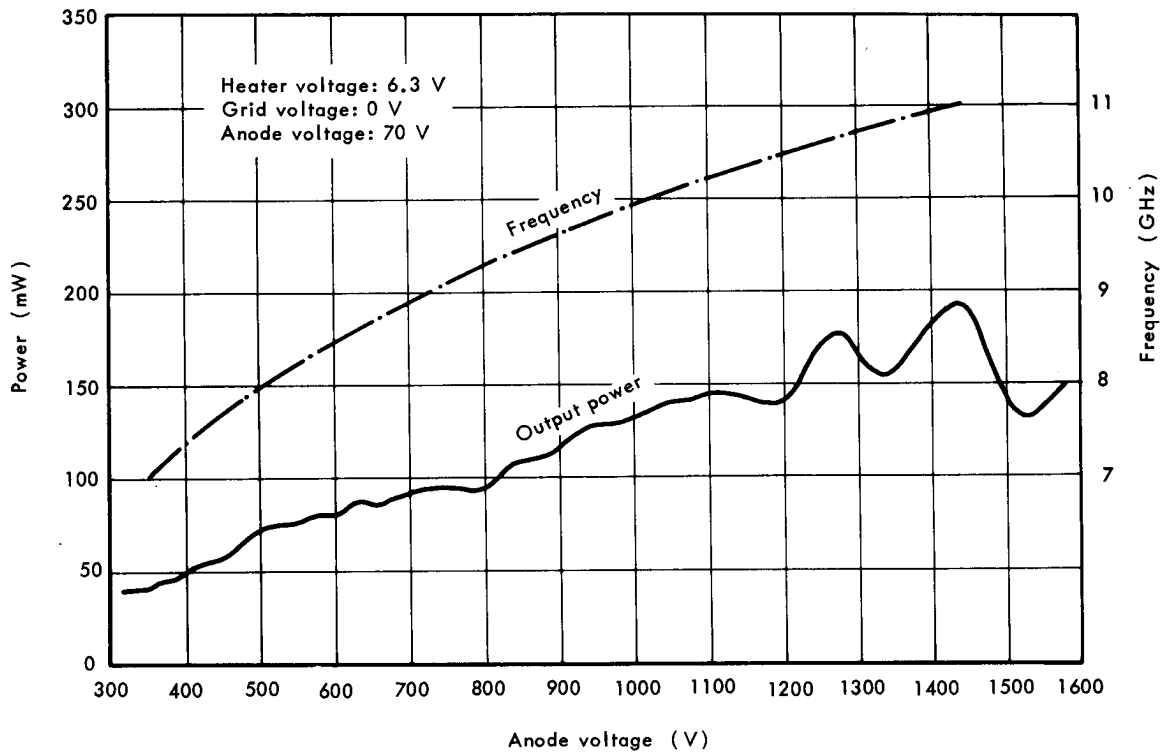
The supply should feature the following security devices :
Warm-up timing,
Power supply protection against arcing or short circuit which may occur in the tube,
Protection against applying voltages before starting air flow.
A safety device should prevent anode voltage from exceeding line voltage, even in case of modulation. If grid and anode power supplies present high internal resistance, a 50 kΩ resistance should be connected in parallel.

Permanent magnet

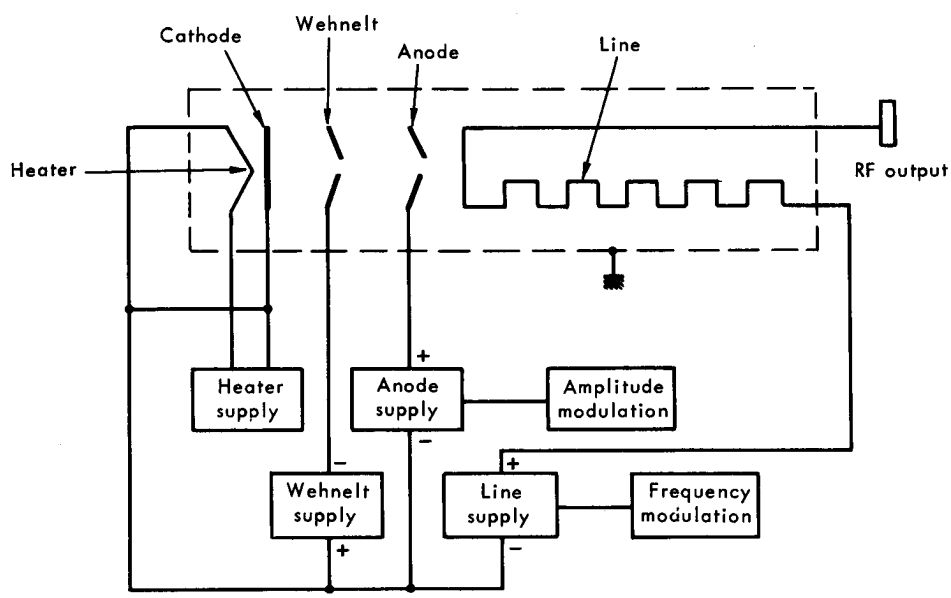
The tube should be kept away from all magnetic materials, at least 10 cm, and 15 cm away from field generating devices.

(1) T point indicated on drawing

Characteristic curves



Supply diagram



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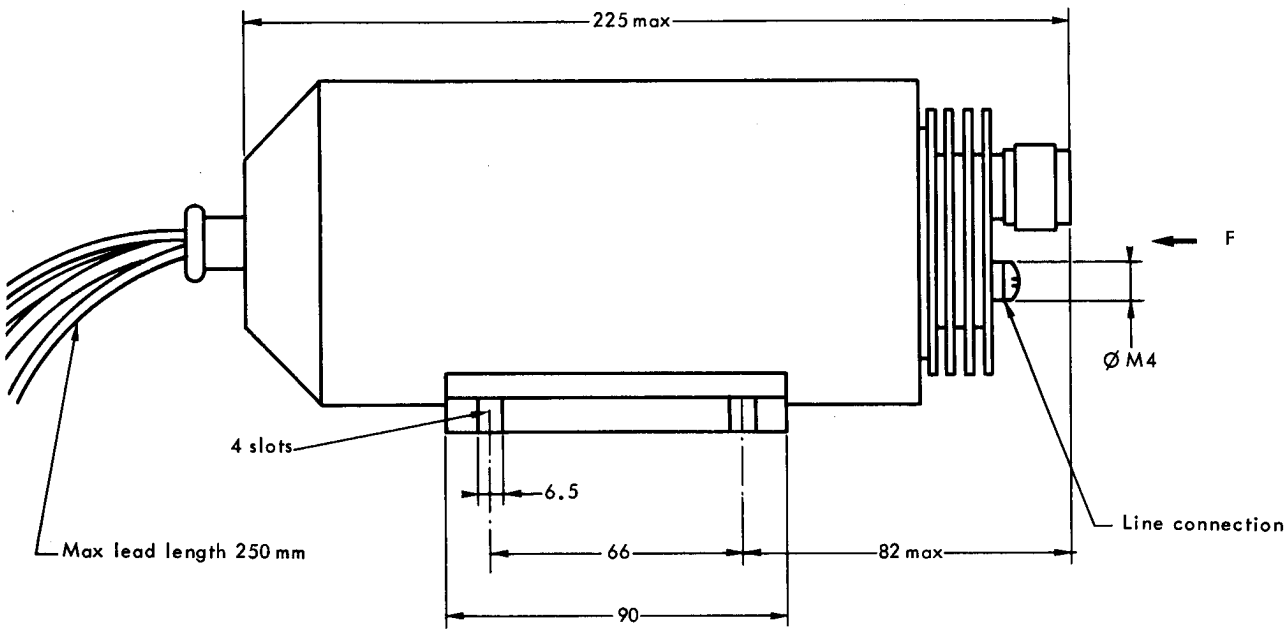
OUTLINE DRAWING



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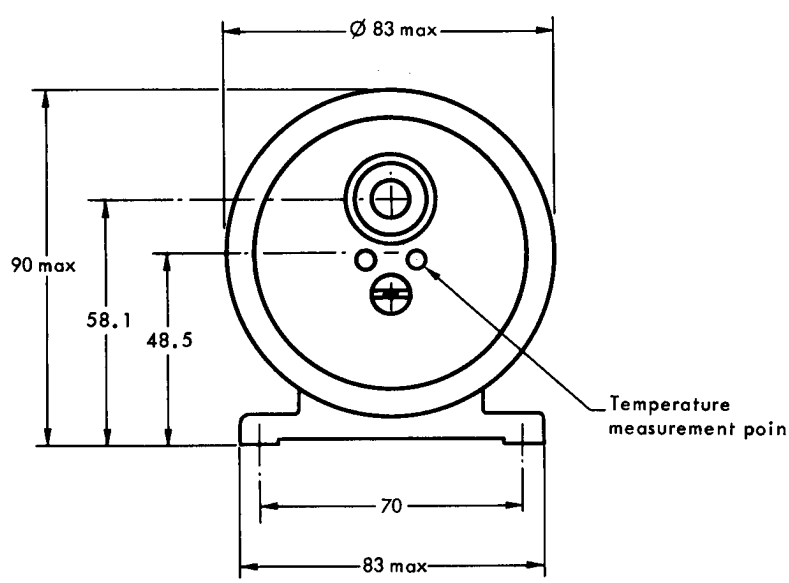

CONNECTIONS	
Heater	Brown
Cathode	Yellow
Anode	Blue
Wehnelt	Green
Line	Red (on heat sink)

The line is isolated from the magnet.

Dimensions in mm.