CO.10.1 CARCINOTRON

The CO.10.1 is a millimetric backward wave oscillator, focused by an integral permanent magnet, water cooled and delivering an output power over a frequency range of 275 to 290 GHz.

It can be amplitude modulated through its anode. Frequency modulation can be obtained by line voltage (1) variation, the frequency being independent of the load up to a VSWR of 3 : 1.

The high power obtained at such a high frequency makes it particularly suitable for physical measurements as plasma analysis, parametric resonance, study of the fine structure of the matter. It can be used also for transmission measurements, scaling, etc . . .

In short, the main features of the CO. 10. 1 are :

- Minimum output power : 0. 2 W from 275 GHz to 290 GHz
  1 W in one point at least between 280 and 290 GHz.
- Frequency and amplitude modulation .

(1) Line voltage or beam voltage.

GENERAL CHARACTERISTICS

Electrical

	min.	max.	
Frequency	275	290	GHz
Heater voltage	− 8. 5	− 6	V
Heater current	2. 0	2. 5	A
Wehnelt (2) voltage	− 250	0	V
Wehnelt current	0	−	mA
Anode (3) voltage for 20 mA line and collector current	800	1000	V
Anode voltage for 30 mA line and collector current	1000	1500	V
Anode current	0	5	mA
Line voltage (at lower frequencies)	5000	−	V
Line voltage (at higher frequencies)	−	11000	V
Line and collector current	−	30	mA
Modulation sensitivity	1	20	MHz/V
Pushing	40	80	MHz/mA
Collector voltage	4000	6500	V

(2) Wehnelt or Focusing electrode.
(3) Anode or Accelerator.

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MECHANICAL

Operating position	horizontal	RF output flange	UG 387/U
Focusing	permanent magnet	Input connector	HT plug (see drawing)
RF output waveguide	RG 138/U	Weight	32 kg

ABSOLUTE RATINGS (1)

Heater voltage	Vnom ± 3 %		Anode voltage	max.	3 000	V
Surge current	max.	2. 55 A	Anode current	max.	10	mA
Wehnelt voltage	max.	0 V	Line voltage	max.	12 000	V
Wehnelt current	max.	5 mA	Line and collector current	max.	30	mA
Warm-up time	min.	4 mn	Collector voltage	max.	8 000	V
			Load VSWR	max.	5 : 1	

TYPICAL OPERATION (1)

Heater voltage	− 7. 8 V	Frequency	285	289	GHz
Heater current	2. 2 A	Collector voltage	5 500	5 500	V
Warm-up time	4 mn	Line voltage	8 800	9 760	V
		Line and collector current	30	30	mA
		Anode voltage	1 130	1 130	V
		Anode current	0	0	mA
		Wehnelt voltage	0	0	V
		RF output power	see curves		

(1) All voltages are referred to the cathode.

OPERATING INSTRUCTIONS

Application of voltages :

- Start the liquid flow through the line cooling circuit.
- Start the distilled water through the collector cooling circuit.
- Apply voltages in the following order : heater (allow four minutes minimum cathode warm-up time), Wehnelt, line, collector, anode.

Protective measures :

- A minimum distance of 25 cm should be kept between the tube and any magnetic material.
- Do not try to obtain modulation through the Wehnelt voltage.
- Operating parameters are given in each tube test data sheets, and are always within the absolute ratings indicated here.

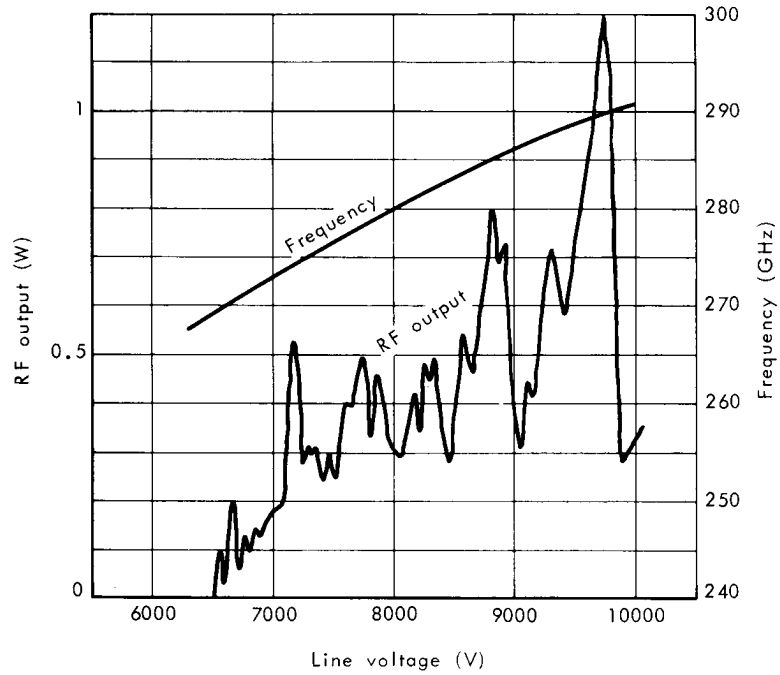
The supply should feature the following current limitations :

Heater	2. 5	A
Wehnelt	5	mA
Anode	5	mA
Line	30	mA
Collector	30	mA

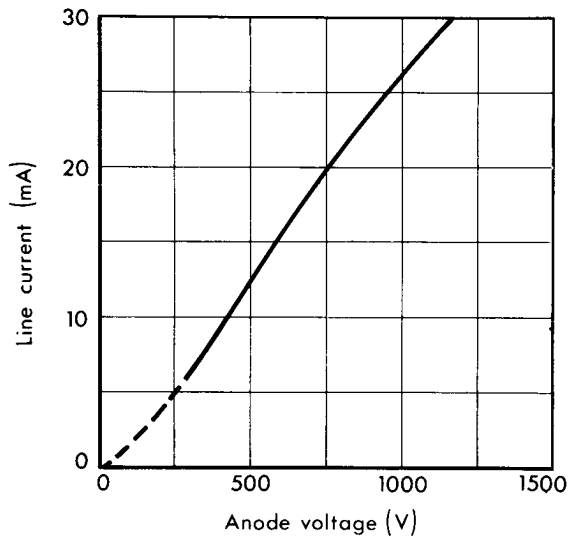
- Protection against shorts or flashes which could occur in the tube.
- Warm-up timing.
- External water interlock for line and collector cooling circuit.
- Line overvoltage (line voltage ⩾ Anode voltage + 1 500 V).

characteristic curves (typical values)

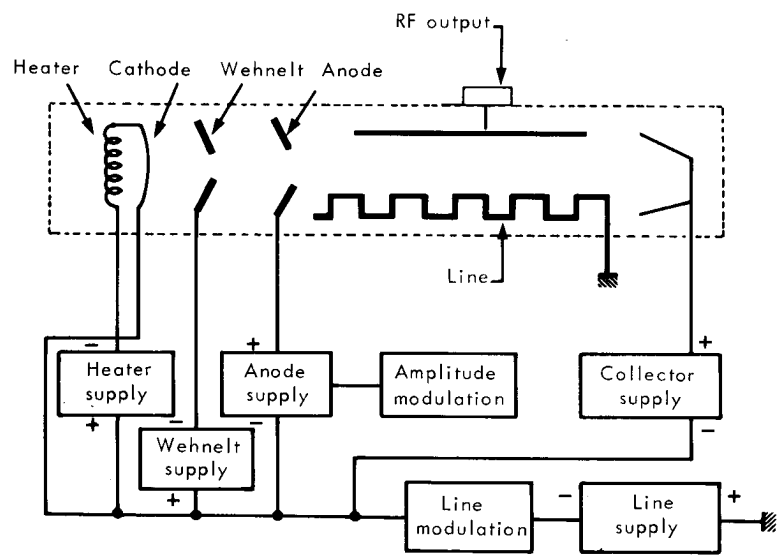
Heater voltage (dc)	- 7.8 V
Heater current (dc)	2.2 A
Collector voltage (dc)	+ 5500 V
Anode voltage (dc)	+ 1130 V
Cathode current (dc)	30 mA



Heater voltage (dc)	- 7.8 V
Heater current (dc)	2.2 A
Collector voltage (dc)	+ 5500 V
Line voltage (dc)	6000 V



supply diagram



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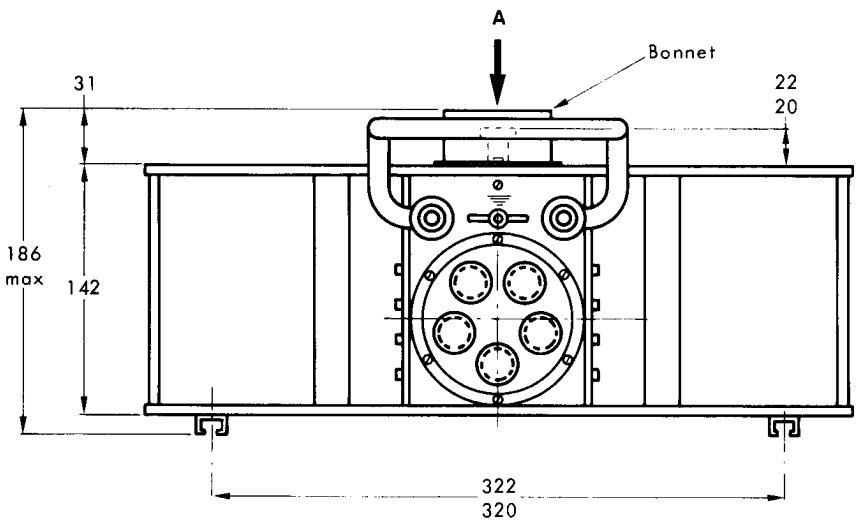
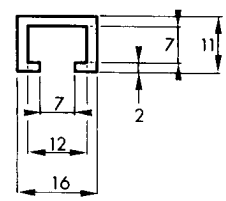
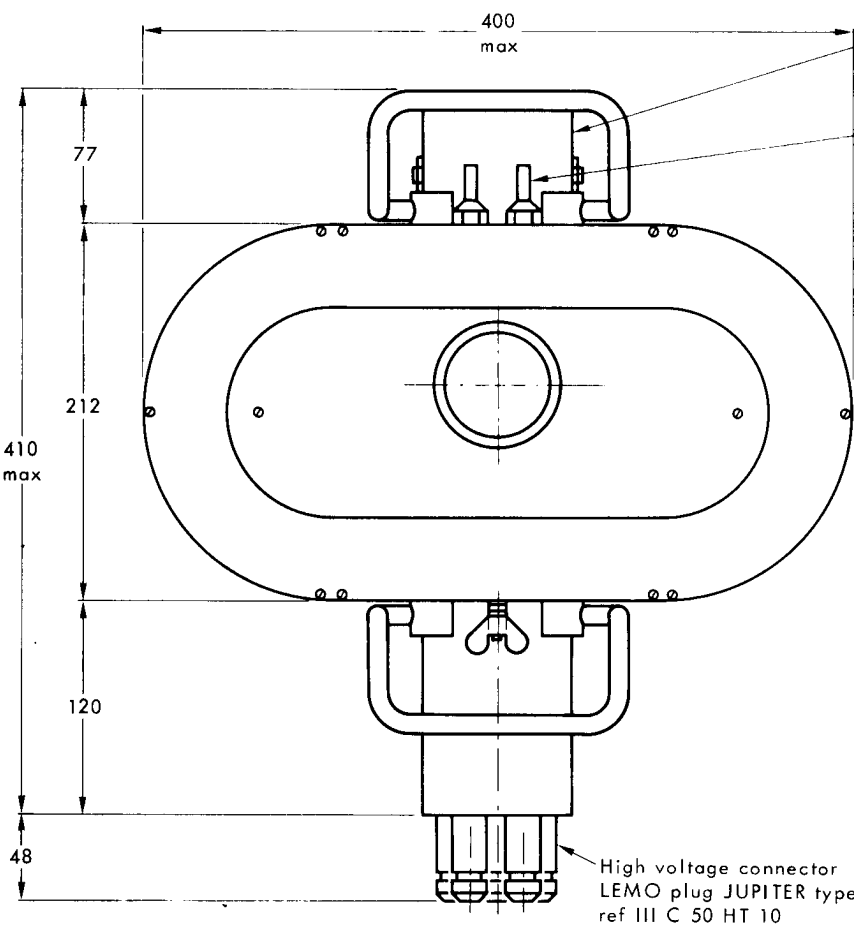
OUTLINE DRAWING

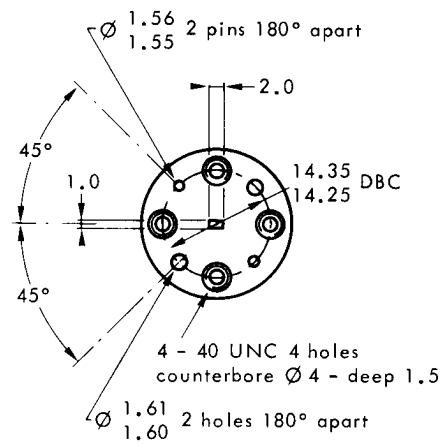


POSITIONING RAIL





RF OUTPUT
view A



Dimensions in mm.