



KLYSTRON TV 2014

The TV 2014 is intended for use as a source of rf power for linear accelerator service. It is a five-cavity high power sealed-off klystron amplifier able to deliver a 30 kW average power min and a 25 MW peak power min in S-band. It is pretuned in factory at a given center frequency in the range 2700 - 3100 Mc.

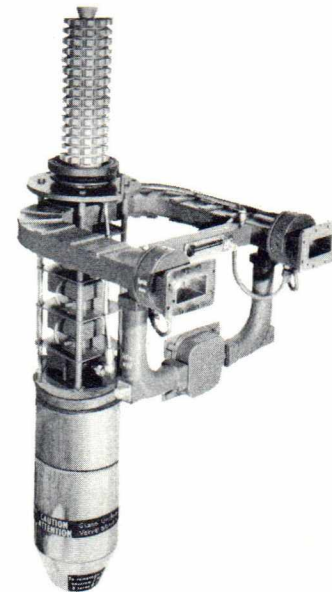
The rf input is made on a 50 Ω -N type coaxial plug and the output through two ceramic windows. The total rf output power may be recombined in a single waveguide by use of a TV 19101 recombiner.

The beam focusing is obtained by a TV 19008 focus coil external to the tube. The windows, body and collector of the tube are cooled by a single water flow, The collector being cooled by water vaporization according to the Vapotron technique * which insures a high safety of operation.

The structure of the tube includes an active getter which insures a permanent high vacuum.

In short, the TV 2014 klystron offers the following main advantages :

- high power
- high efficiency
- high gain
- high reliability



CHARACTERISTICS

Mechanical

Dimensions	see drawing page 5
Mounting position	vertical, cathode down
Weight	65 kg (145 lbs) approximately
Envelope	metal, ceramics and glass
RF input	UG 22 D/U plug
RF output	two RG 48/U waveguides with reduced rectangular flanges (see drawing page 6)
Active getter input	UG 496/U plug
Cooling water inlet	STAUBLI plug, small size

* C.F.T.H. reg. trade mark

**Electrical**

Cathode	unipotential, indirectly heated
Heater voltage (a.c or d.c)	25 V $\pm$ 5 % (1)
Hot heater resistance	1 Ω $\pm$ 10 %
Cold heater resistance	0.14 $\pm$ 10 %
Frequency	S band
Bandwidth	min 15 Mc
Tuning	no tuning (2)
Perveance	2.1 $\pm$ 0.1 μ A. V $^{-3/2}$
Peak output power	min 25 MW
Average output power	min 30 kW
Efficiency (for an output peak power 10 MW).....	min 40 %
Drive, peak	nom 200 W

Accessories

RF input connector.....	UG 21 D/U (coaxial line RG 143/U)
Waveguide flanges	RH 1404 158 or equivalent, must fit the flanges of the klystron (drawing page 6)
Active getter connector.....	UG 60 D/U
Water inlet connector.....	STAUBLI connector (provided with each tube), fits a 8 or 13mm inner diameter tube. When disconnected from the plug, the connector locks the water circuit.
Focus coil	TV 19008
Recombiner.....	TV 19101
Heater-cathode connector	TV 19201
Vapodyne * system	see data NZ 1253

(1) The exact heating voltage is indicated on the testing sheet of each tube.
This voltage is to be observed within $\pm$ 5 %.

(2) The tube is tuned in factory. Do not touch the locking devices of the cavities.

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TYPICAL OPERATION

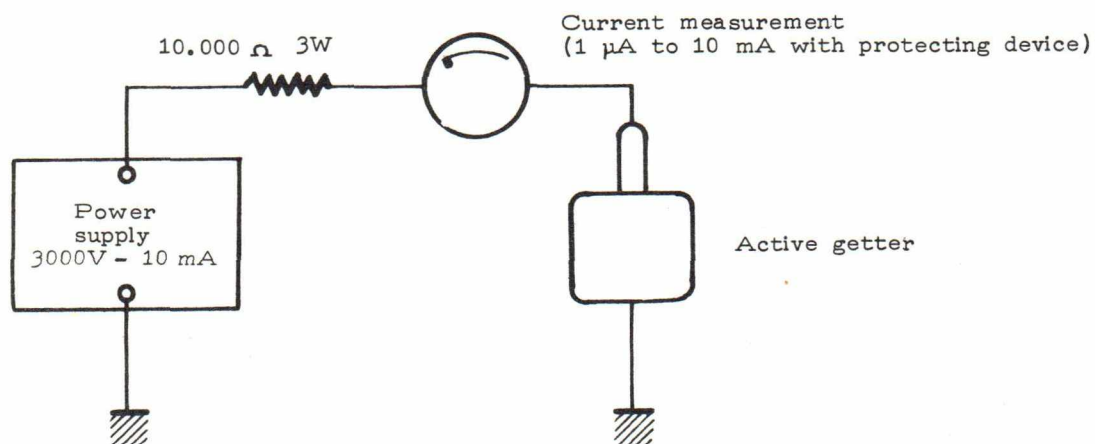
(Load : V S W R $\leq$ 1,1)

Beam voltage	235 kV
Beam current	240 A
Output, peak	25,5 MW
Output, average	30,5 kW
Gain	5 db
Bandwidth (- 1 db)	30 Mc
Efficiency	45 %
Pulse duration	4 μ s
Duty cycle	.0012
Water flow	5 l/mn
Water inlet pressure	2 kg/cm ²

MAXIMUM RATINGS

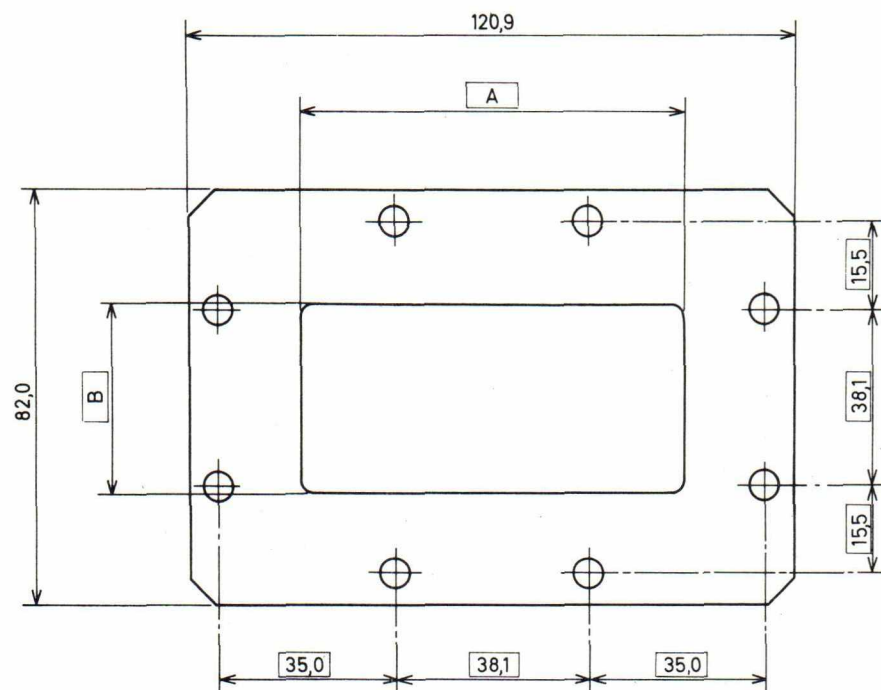
(non simultaneous)

Heater warm-up time	min 15 mn
Heater surge current	max 50 A
Beam voltage	max 270 kV
Average applied power	max 67.5 kW
Efficient d.c pulse duration	max 11 μ s
Duty cycle	max .002
Load V S W R	max 1.5
Absolute pressure on the output windows	max 4 kg/cm ²
Cooling water inlet temperature	max 50°C
Cooling water flow	min 5 l/mn
Cooling water inlet pressure	max 8 kg/cm ² gen

ACTIVE GETTER FEEDING CIRCUIT

The active getter operation requires the use of a TV 19500 permanent magnet supplied with TV 19008 Focus Coil.

KLYSTRON OUTPUT FLANGE



all dimensions in mm.

8 holes $\phi 6,2^{+0,2}$ $\begin{array}{|c|} \hline \blacklozenge 0,2 \\ \hline \end{array}$
group $\begin{array}{|c|c|} \hline \equiv 0,5 & AB \\ \hline \end{array}$

