

Peak r.f. input power	nom.	100	W
Bandwidth at -1 db	min.	10	MHz
Efficiency	min.	40	%

TYPICAL OPERATION
(matched load, VSWR $\leq$ 1.1 : 1)

Beam voltage, peak	120	kV
Beam current, peak	83	A
Pulse duration, r.f. (-3 db)	10	μ s
Pulse repetition rate	1500	Hz
Output, peak	4.5	MW
Output, avg.	67.5	kW
Gain	47	db
Bandwidth (-1 db)	20	MHz
Efficiency	45	%

MAXIMUM RATINGS
(non simultaneous.)

Warm-up time	min.	15	mn
Heater surge current	max.	50	A
Beam voltage, peak	max.	135	kV (1)
Power supply, avg.	max.	180	kW
Effective beam pulse duration	max.	12	μ s (1)
Output power, avg.	max.	68	kW
Waveguide output VSWR	max.	1.3	
Absolute pressure on the output windows	max.	4	kg/cm ²
Cooling water inlet temperature ...	max.	50	°C
Cooling water flow	min.	8	l/mn
Cooling water inlet pressure	max.	8	kg/cm ²

(1) May be increased upon request and with THOMSON-VARIAN acceptance.



ACCESSORIES

A - CONNECTIONS

Active getter connector	UG 59 D/U
r.f. input connector	UG 21 D/U (for RG 9 B/U coaxial cable or equivalent)
Heater-cathode connector	TV 19 201
Waveguide flange	mates with klystron flange (see drawing page 5)

B - COOLING

Cooling water inlet	Staubli, TV 19 343 mates with 8 to 10 dia. drain (1)
Vapodyne system	see data NZ 1195 "Cooling of high power klystron"

C - ELECTROMAGNET

Type number	TV 19 008
Electrical characteristics :	I_1 max. 150 A
	I_2 max. 150 A
	I_3 max. 150 A
	coil resistances : max. 0.1 Ω
Cooling circuit :	water flow : min. 7 l/mn
	water inlet pressure : max. 8 kg/cm ²

D - SUPPLY CHARACTERISTICS OF THE ACTIVE GETTER

Voltage	5.0 kV
Current	max. 0.2 A

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- (1) When the inlet water connector is taken off, the water flow is automatically locked.



TV 2013 KLYSTRON

The tube TV 2013 is a high power, sealed-off, pulsed amplifier klystron for fixed frequency operation in "S" band. It delivers, with a high gain, at least 60 kW average power output and 4 MW peak power output.

It is a five-cavity klystron pretuned at a given frequency in the range 2700 - 3100 MHz. The r.f. input is made on a coaxial plug and the r.f. output through two ceramic windows set on waveguides.

An active getter insures a permanent high vacuum.

The beam focusing is obtained by focus coils external to the tube.

The windows and the body of the tube are cooled by a water circulation connected to a boiler located around the collector. The collector is cooled by water vaporization according to the Vapotron (1) technique which insures a high safe operation (2).

The TV 2013 klystron offers the following main advantages :

- high gain : 45 db
- high efficiency : more than 40 %
- long life, the tube being fitted with an active getter
- high operating safety due to the Vapotron (1) cooling technique of the collector.

(1) C.F.T.H. reg. trade mark.

(2) An other type of cooling device is available upon request : the collector cooling may be obtained by water circulation, not by water vaporization. In that case, two different circuits cool, one the collector, the other one the windows and body of the tube.



MECHANICAL CHARACTERISTICS

Dimensions	see outline drawing page 6
Mounting position preferred	vertical, cathode down
Weight approximate	86 kg
Envelope	metal, glass and ceramic

CONNECTIONS

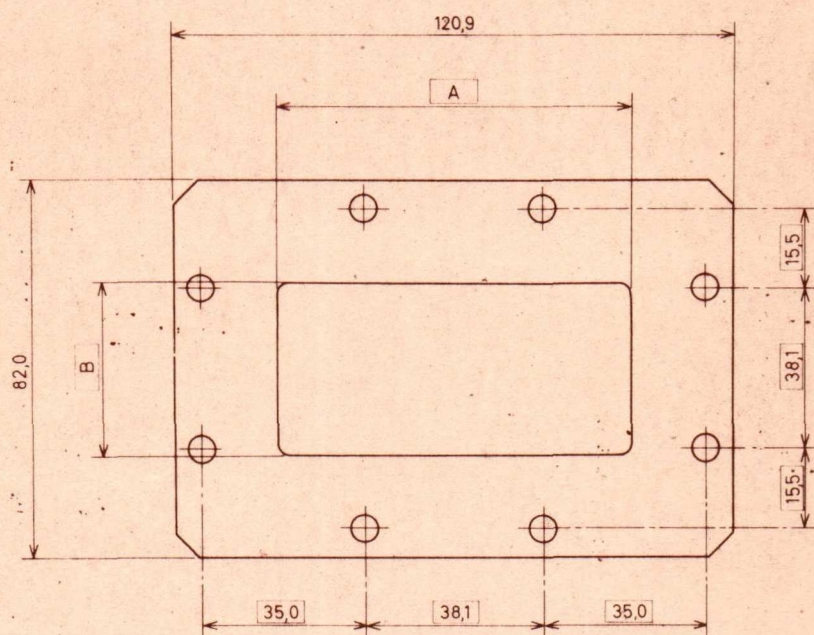
Anode and cathode connections	special connectors see page 4 "Accessories"
r.f. input	UG 22 D/U plug
r.f. output	2 waveguides WR 284 with small rectangular flanges (drawing page 5)
Active getter input	UG 496/U plug
Water inlet	special plug

GENERAL ELECTRICAL CHARACTERISTICS

Cathode	oxide coated, unipotential
Heater voltage (a.c. or d.c.)	25 V $\pm 10\%$ (1)
Heater resistance (hot)	1 Ω $\pm 10\%$
Heater resistance (cold)	0.14 Ω $\pm 10\%$
Perveance	2.0 $\pm 0.1 \mu A \cdot V^{-3/2}$
Duty cycle	nom. 0.015
Pulse duration, r.f.	max. 10 μs (2)
Frequency	2700 - 3100 MHz (3)
Output, peak	min. 4 MW (4)
Output, avg.	min. 60 kW

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- (1) Exact heater voltage is indicated on test performance sheet of each tube. This voltage is to be observed within $\pm 5\%$.
 - (2) Pulse duration may be increased on request and with THOMSON-VARIAN acceptance.
 - (3) The tube is tuned in factory for operation at a given frequency.
 - (4) Nominal peak output power may be increased for special operating conditions and with THOMSON-VARIAN acceptance.

KLYSTRON OUTPUT FLANGE

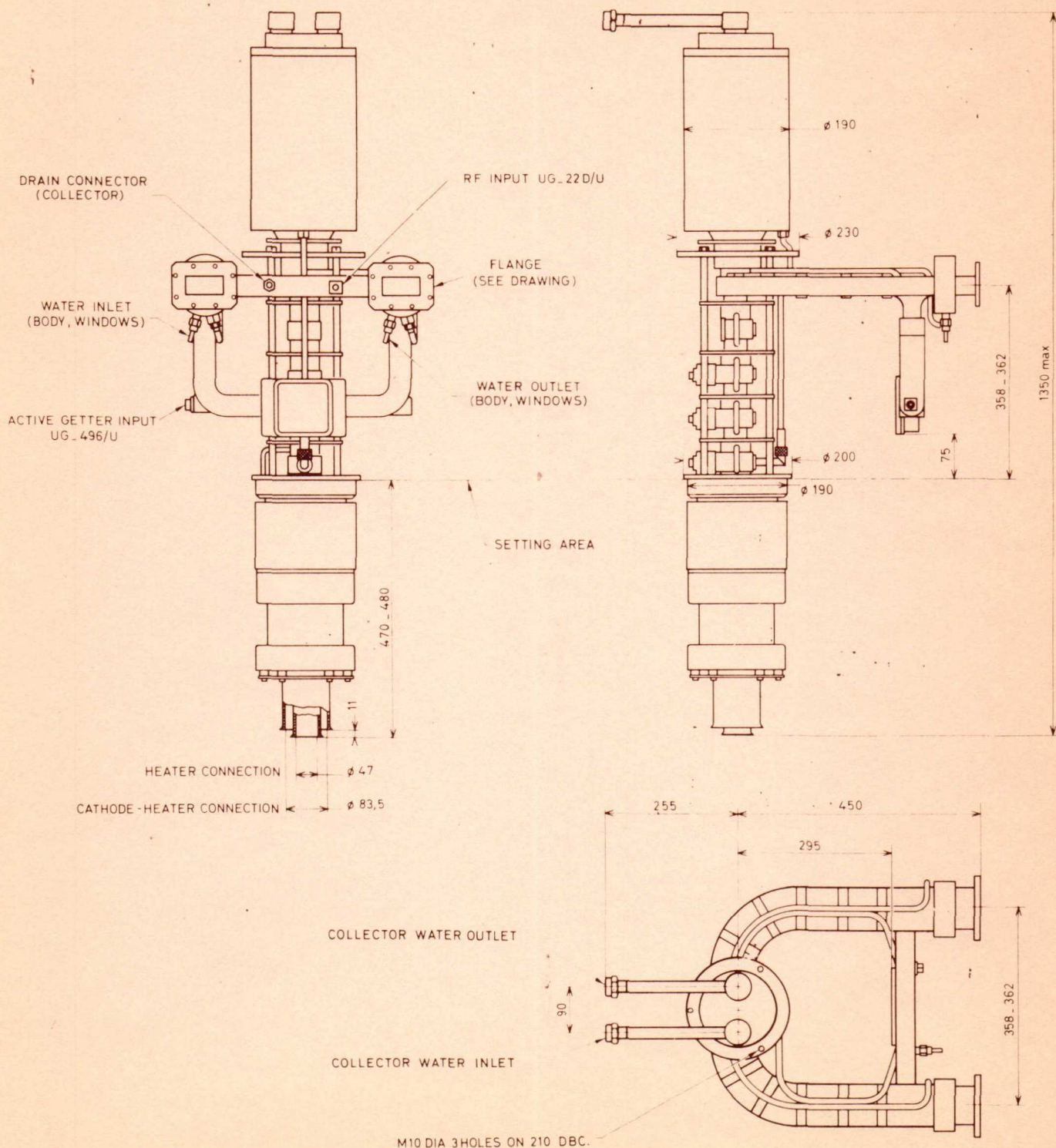


8 holes $\phi 6,2^{+0,2}$ $\begin{bmatrix} \blacklozenge 0,2 \end{bmatrix}$
group $\begin{bmatrix} \equiv 0,5 \end{bmatrix} \text{ AB}$

TV 20-13 - 568 030

KLYSTRON TV 2013

Outline Drawing



Dimensions in mm

