

13 kW

- Output power:
13 kW in CW mode
- Anode voltage: 7.2 kV
- Anode dissipation: 6 kW
- Frequency up to 150 MHz





ITK 5-1

The ITK 5-1 is a RF power triode designed specifically for industrial applications.

This tube uses a coaxial design and metal-ceramic technology. This triode may be operated in CW or pulse modes.

For operation in pulse mode, the parameters depend on each equipment characteristics. Contact us for specific information.

The ITK 5-1 is a water cooled triode.

This product is designed, developed and manufactured at an ISO 9001 registered production site.

Electrical characteristics

Filament	thoriated tungsten		
Filament voltage (+ 5 %, - 10 %) (1)	6.3	V	
Filament current	65	A	
Surge current	250	A	max.
Cold resistance	12	mΩ	
Capacitances:			
• grid-anode	16	pF	
• grid-cathode	21	pF	
• cathode-anode (2)	0.6	pF	
Amplification factor	20		approx.
Transconductance (Va: 4 kV, Ia: 4 A)	23	mA/V	approx.

Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	1.8	kg	approx.
Dimensions	see outline drawing		

Maximum ratings

Frequency (3)	150	MHz	
Anode voltage:			
• up to 85 MHz	7.2	kV	
• from 85 to 150 MHz	6	kV	
Control grid voltage	- 1 000	V	
Anode current, CW	2.5	A	
Control grid current:			
• at full load, CW	0.55	A	
• at no load, CW	0.75	A	
Peak cathode current, CW	15	A	
Anode dissipation:			
• industrial cooling water	5	kW	
• distilled or deionized water	6	kW	
Grid dissipation:			
• up to 85 MHz	200	W	
• from 85 to 150 MHz	170	W	
Grid resistance (tube non conducting)	20	KΩ	

(1) At frequencies above 50 MHz, the filament voltage is reduced so that the ratio of filament voltage to current becomes the same as that without an anode voltage.

(2) Measured with a 40 x 40 cm shielding plate attached to the grid plate.

(3) Limited conditions above 30 MHz. Please consult Thales Electron Devices.

Cooling

Anode cooling	water		
Cooling water flow and pressure gradient	see cooling curves		
Temperature at outlet (industrial water)	see cooling curves		
Cooling water inlet pressure	5	bar	max.
Temperature at any point on tube envelope	220	°C	max.
Air flow on filament head	0.5	m ³ /min	

Typical operation (4)

Examples	Class C RF oscillator for industrial applications		
	1	2	
Frequency	30	30	MHz
Anode voltage	6.8	5.5	kV
Grid bias	- 540	- 450	V
Grid voltage	890	780	V
Anode current	2.5	2.3	A
Grid current, on load	0.43	0.43	A
Anode input power	17	12.7	kW
Anode output power	12.9	9.5	kW
Anode dissipation	3.9	3	kW
Grid dissipation	142	127	W
Grid resistance	1 250	1 050	Ω
Feedback ratio	15	16	%
Oscillator efficiency	75.8	74.3	%

(4) Operation with higher frequencies on request.

Cooling curves

Distilled, deionized or tap water may be used for cooling. The water flow rate and pressure drop required for a particular anode dissipation are indicated on the cooling curves.

P_a : anode dissipation

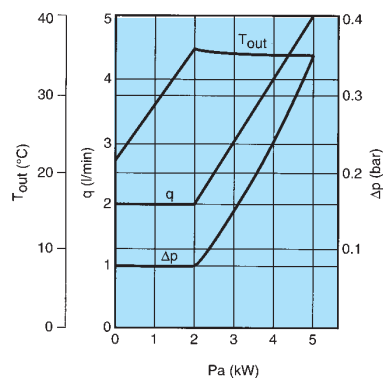
Δp : pressure drop across the water cooler

q : water flow rate

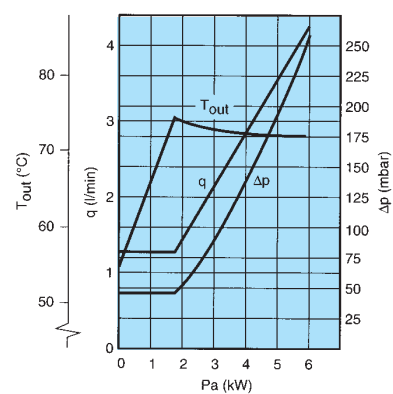
T_{out} : outlet water temperature

(for an inlet water temperature of 20°C with industrial water and 50°C with distilled or deionized water).

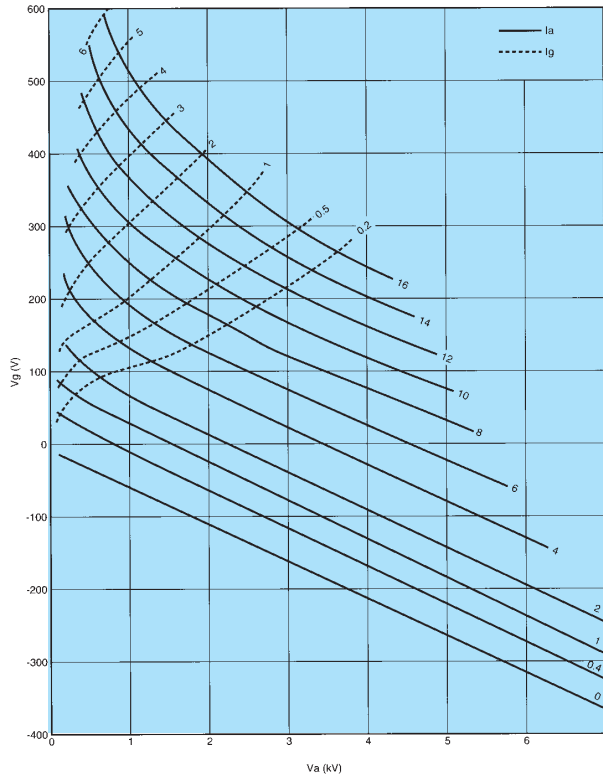
Industrial water - minimum resistivity: 5 kΩ.cm



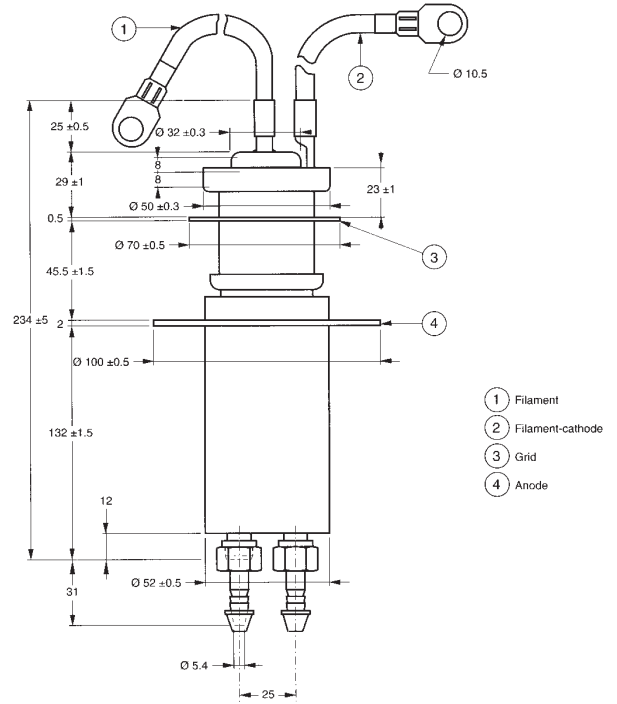
Distilled or deionized water - minimum resistivity: 50 kΩ.cm



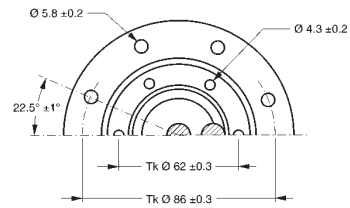
Constant current characteristics



Outline drawing (dimensions in mm)



Top view (dimensions in mm)



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For further information, please contact:

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