

ITK 350-1

Water cooled triode

1000 kW

- Output power:
1000 kW in CW mode
- Anode voltage: 22 kV
- Anode dissipation: 500 kW
- Frequency up to 30 MHz





ITK 350-1

The ITK 350-1 is a high-power triode designed specifically for industrial applications.

This tube uses a coaxial design and metal-ceramic technology. This triode is designed to operate in CW mode.

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

The ITK 350-1 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)	24	V	
Filament current	620	A	
Surge current	1 800	A	max.
Cold resistance	5	m	
Capacitances:			
• grid-anode	155	pF	
• grid-cathode	420	pF	
• cathode-anode (2)	10	pF	
Amplification factor	28		approx.
Transconductance (Va: 10 kV, Ia: 40 A)	370	mA/V	approx.

Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	72	kg	approx.
Dimensions	see outline drawing		

Maximum ratings

Frequency (3)	30	MHz	
Anode voltage:			
• up to 10 MHz	22	kV	
• from 10 to 30 MHz	18	kV	
Control grid voltage	- 2 000	V	
Anode current, CW	90	A	
Control grid current:			
• at full load, CW	20	A	
• at no load, CW	24	A	
Peak cathode current, CW	500	A	
Anode dissipation:			
• distilled or deionized water	500	kW	
Grid dissipation:			
• up to 10 MHz	10	kW	
• from 10 to 30 MHz	9	kW	
Grid resistance (tube non conducting)	10	K	

(1) At frequencies above 30 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 10 MHz. Please consult Thales Electron Devices.

Cooling

Anode cooling	water		
Cooling water flow and pressure gradient	see cooling curve		
Cooling water inlet pressure	5	bar	max.
Temperature at any point on tube envelope	220	°C	max.
Air flow on filament head	2	m ³ /mn	
Air pressure into filament and grid head	30	mbar	

Typical operation (4)

Examples	Class C RF oscillator for industrial applications		
	1	2	
Frequency	10	10	MHz
Anode voltage	18	16	kV
Grid bias	- 1 025	- 880	V
Grid voltage	1 655	1 400	V
Anode current	77	66	A
Grid current, on load	16	13	A
Anode input power	1 386	1 056	kW
Anode output power	1 024	780	kW
Anode dissipation	336	259	kW
Grid dissipation	8.8	5.8	kW
Grid resistance	64	68	
Feedback ratio	10.5	10	%
Oscillator efficiency	74	74	%

(4) Operation with higher frequencies on request.

Cooling curve

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

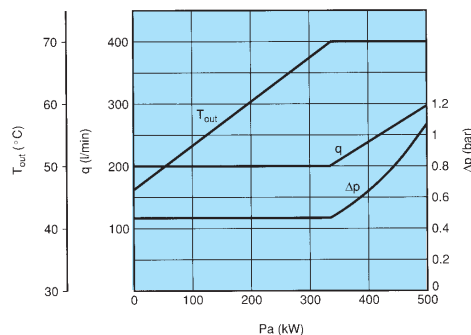
Δp : pressure drop across the water cooler

q : water flow rate

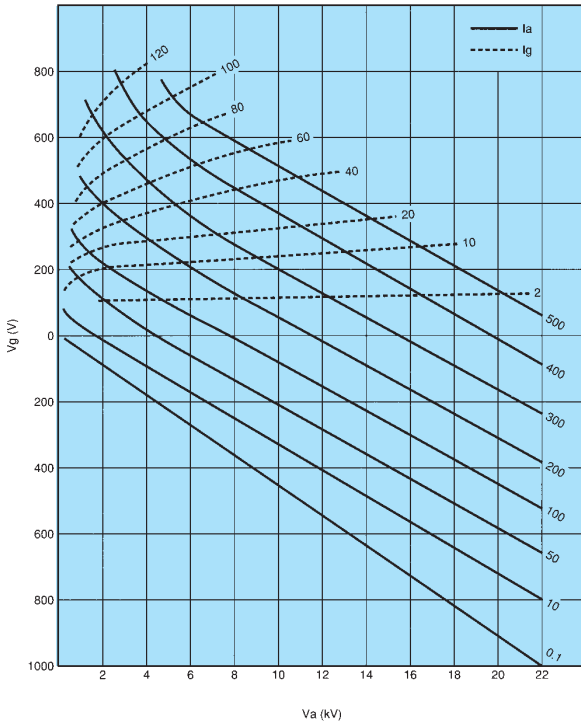
T_{out} : outlet water temperature

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

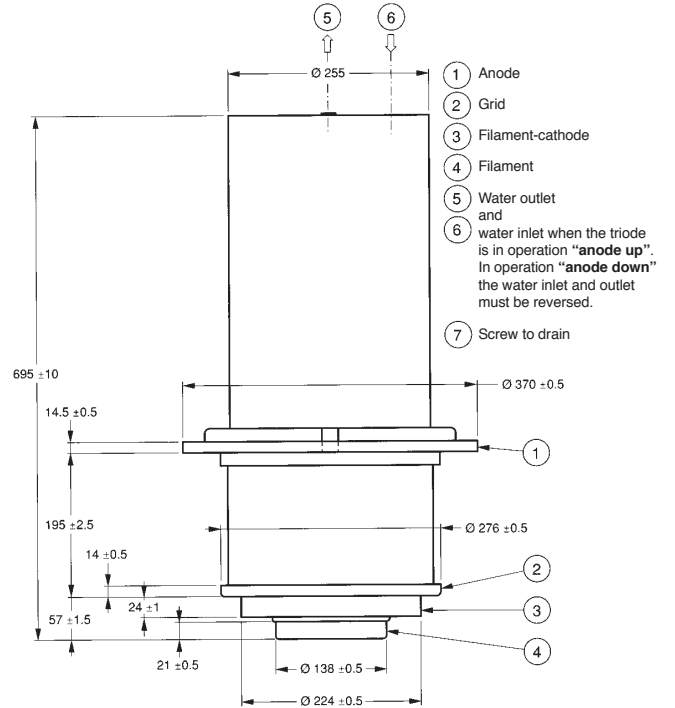
Distilled or deionized water - minimum resistivity : 50 kΩ.cm



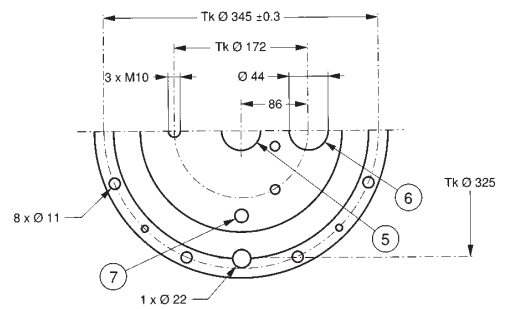
Constant current characteristics



Outline drawing (dimensions in mm)



Top view (dimensions in mm)



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For further information, please contact:

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