INDUSTRIAL
RF HEATING

ITK 15-2

Water cooled triode

63 kW

- Output power:
  63 kW in CW mode
- Anode voltage: 13 kV
- Anode dissipation: 20 kW
- Frequency up to 120 MHz

THALES

ITK 15-2

The ITK 15-2 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 15-2 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)	7.2	V	
Filament current	180	A	
Surge current	500	A	max.
Cold resistance	5	mΩ	
Capacitances:			
• grid-anode	25	pF	
• grid-cathode	60	pF	
• cathode-anode (2)	1.4	pF	
Amplification factor	25		approx.
Transconductance (Va: 4 kV, Ia: 4 A)	60	mA/V	approx.

Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	3.8	kg	approx.
Dimensions	see outline drawing		

Maximum ratings

Frequency (3)	120	MHz
Anode voltage:		
• up to 30 MHz	13	kV
• from 30 to 60 MHz	11	kV
• from 60 to 90 MHz	9	kV
• from 90 to 120 MHz	7	kV
Control grid voltage	- 1 500	V
Anode current, CW	8	A
Control grid current:		
• at full load, CW	1.6	A
• at no load, CW	3	A
Peak cathode current, CW	40	A
Anode dissipation:		
• industrial cooling water	20	kW
• distilled or deionized water	20	kW
Grid dissipation:		
• up to 30 MHz	600	W
• from 30 to 60 MHz	520	W
• from 60 to 90 MHz	460	W
• from 90 to 120 MHz	400	W
Grid resistance (tube non conducting)	10	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)	60	°C	max.
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)

	Class C RF oscillator for industrial applications		
Examples	**1**	**2**	
Frequency	30	30	MHz
Anode voltage	12	10	kV
Grid bias	- 700	- 610	V
Grid voltage	1 060	1 000	V
Anode current	6.8	7.1	A
Grid current, on load	0.70	0.87	A
Anode input power	81.6	71	kW
Anode output power	63	54	kW
Anode dissipation	18	16	kW
Grid dissipation	222	305	W
Grid resistance	1 000	700	Ω
Feedback ratio	9.8	11.1	%
Oscillator efficiency	77	76.6	%

(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.

Pa: anode dissipation

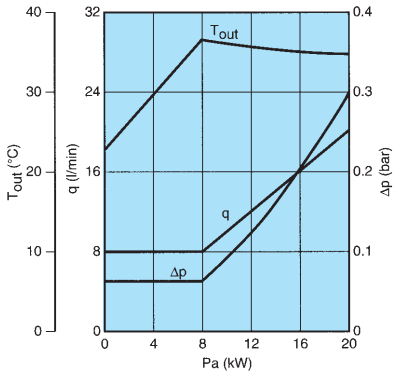
Δp: pressure drop across the water cooler

q: water flow rate

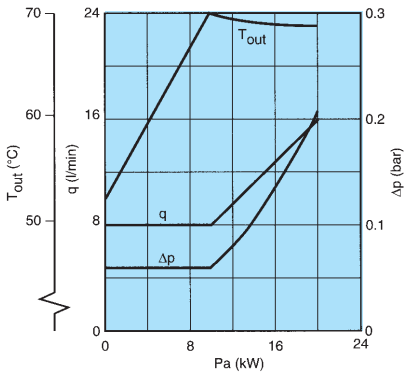
T_{out}: outlet water temperature

(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

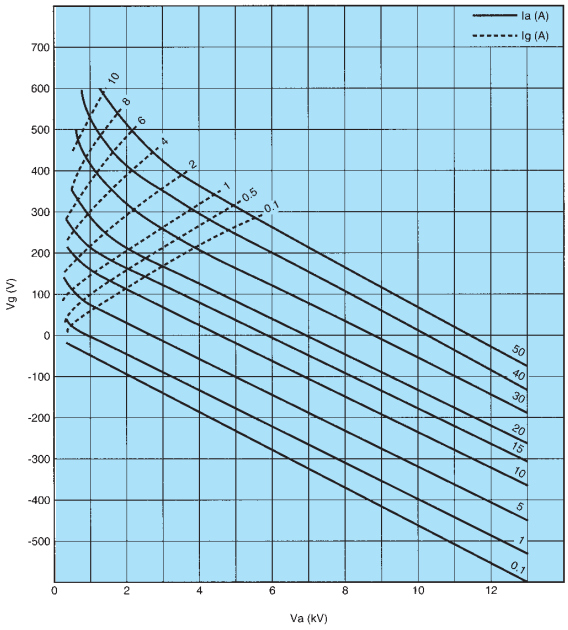


Distilled or deionized water - minimum resistivity: 50 kΩ.cm

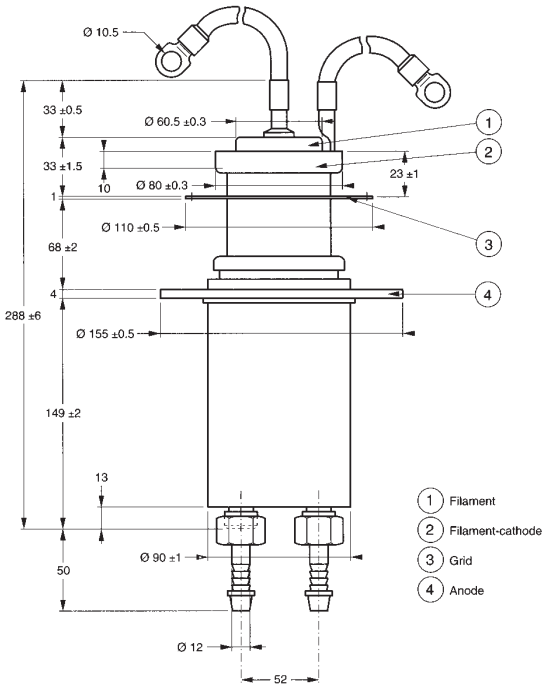


ITK 15-2

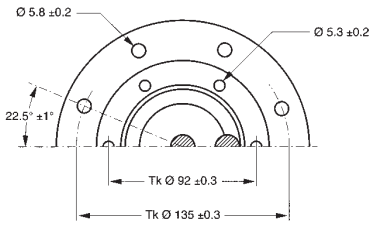
Constant current characteristics



Outline drawing (dimensions in mm)



Top view (dimensions in mm)



For further information, please contact:

THALES ELECTRON DEVICES
2 bis, rue Latécoère - 78941 Vélizy Cedex - France
Tel: + 33 1 30 70 35 00 - Fax: + 33 1 30 70 35 35
www.thalesgroup.com/electrondevices

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