

CTK 12-1 CTK 12-3

High- μ triodes

30 kW

- Output power : 30 kW
in CW mode
- Anode voltage : 12 kV
- Anode dissipation : 15 kW
- Frequencies up to 120 MHz
- Water cooled





CTK 12-1

The CTK 12-1 and CTK 12-3 are high-power, high- μ triodes designed specifically for industrial applications. These tubes use a coaxial design and metal-ceramic technology. They may be operated in CW or pulse modes. For operation in pulse mode, the parameters

depends on each equipment characteristics, contact us for specific information.

These products are designed, developed and manufactured at an ISO 9001 registered production site.

Electrical characteristics

Cathode	thoriated tungsten		
Filament voltage (+5 %, -10 %) (1)	5.8	V	
Filament current	145	A	
Surge current	500	A	max.
Cold resistance	5	m Ω	
Capacitances :			
• grid-anode	21	pF	
• grid-cathode	60	pF	
• cathode-anode (2)	0.2	pF	
Amplification factor	220		approx.
Transconductance (Va : 10 kV, Ia : 4 A)	65	mA/V	approx.

Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	3.1	kg	approx.
Dimensions	see outline drawing		
Filament connections :			
• CTK 12-3	by flexible leads - length 200	mm	approx.
• CTK 12-1	without leads		

Maximum ratings

Frequency (3)	120	MHz	
Anode voltage :			
• up to 80 MHz	12	kV	
• from 80 to 100 MHz	10	kV	
• from 100 to 120 MHz	8	kV	
Control grid voltage	- 1	500	V
Peak cathode current, CW	28	A	
Anode dissipation :			
• industrial water	13	kW	
• distilled or deionized water	15	kW	
Grid dissipation :			
• up to 80 MHz	450	W	
• from 80 to 100 MHz	420	W	
• from 100 to 120 MHz	391	W	
Grid resistance (tube non conducting)	10	K Ω	max.

(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 80 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 /mn	

Typical operation (4)

Class C RF amplifier or oscillator, CW

Frequency	30	60	MHz
Anode voltage	10	8	kV
Grid bias	- 210	- 200	V
Grid voltage	515	500	V
Anode current (5)	4	3.8	A
Grid current (5)	1.4	1.4	A
Anode input power	40	30.4	kW
Anode output power (oscillator)	30	22	kW
Anode dissipation (5)	9	8	kW
Grid dissipation (5)	370	370	W
Grid drive power (6)			
(circuit losses not included)	665	645	W
Grid resistance (oscillator)	150	140	Ω

(4) Other type of operation possible - on request (higher frequencies, AB2-linear amplifier, class B RF amplifier in pulsed operation).

(5) Average value.

(6) Cathode-grounded operation. Grid-grounded operation possible 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

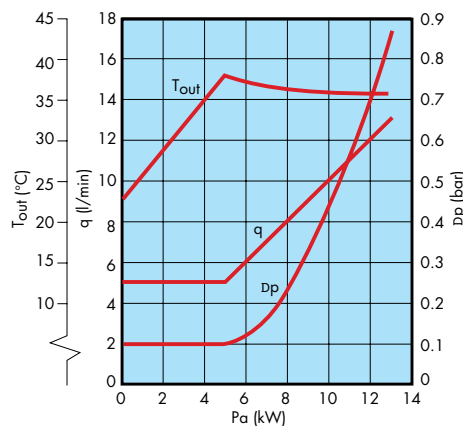
Δp : pressure drop across the water cooler

q : water flow rate

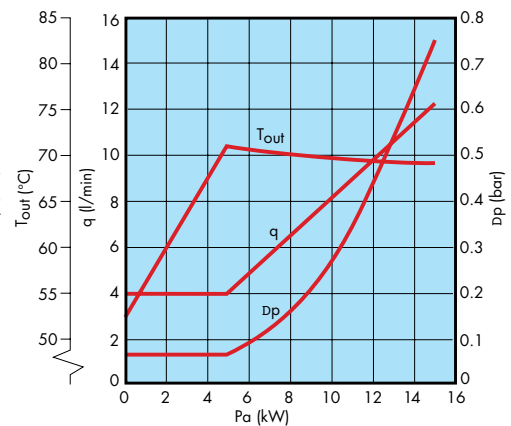
T_{out} : outlet water temperature

(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

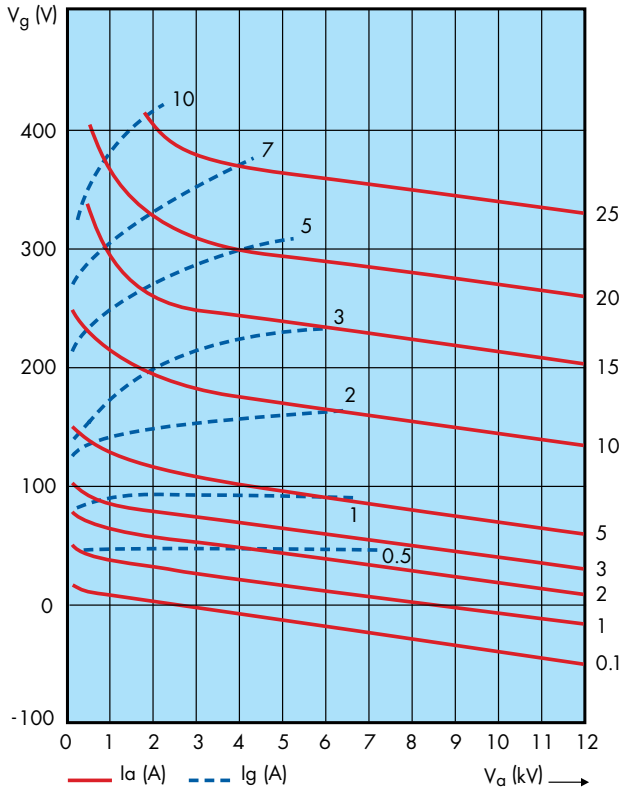


Distilled or deionized water - minimum resistivity : 50 kΩ.cm

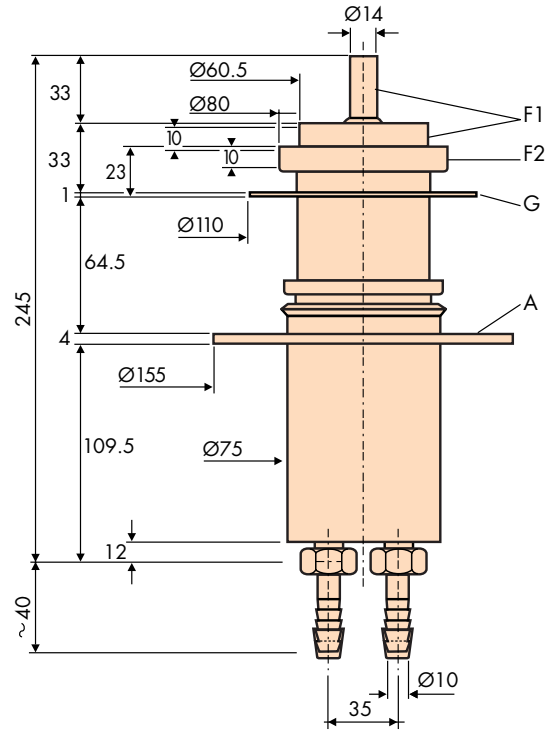


CTK 12-1 CTK 12-3

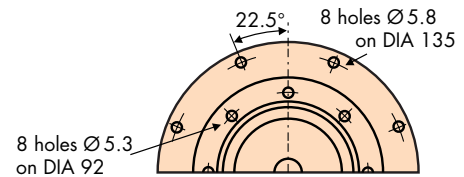
Constant current characteristics



CTK 12-1 outline drawing (dimensions in mm)



Top view (dimensions in mm)



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For further information, please contact:

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