

**CTK 5-1**  
**CTK 5-2**  
High- $\mu$  triodes

**10 kW**

- Output power : 10 kW in CW mode
- Anode voltage : 7.2 kV
- Anode dissipation : 6 kW
- Frequencies up to 150 MHz
- Water cooled





CTK 5-1

The CTK 5-1 and CTK 5-2 are high-power, high- $\mu$  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)	6.3	V	
Filament current	65	A	
Surge current	250	A	max.
Cold resistance	12	m	
Capacitances :			
• grid-anode	17	pF	
• grid-cathode	22	pF	
• cathode-anode (2)	0.07	pF	
Amplification factor	150		approx.
Transconductance ( $V_a$ : 4kV, $I_a$ : 4 A)	25	mA/V	approx.

### Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	1.8	kg	approx.
Dimensions	see outline drawing		
CTK 5-2	filament connection by flexible leads - length 200	mm	approx.
CTK 5-1	without leads		

### 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	- 1000	V	
Peak cathode current, CW	15	A	
Anode dissipation :			
• industrial water	5	kW	
• distilled or deionized water	6	kW	
Grid dissipation :			
• up to 85 MHz	300	W	
• from 85 to 150 MHz	230	W	
Grid resistance (tube non conducting)	10	k	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 85 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 <sup>3</sup> /mn	

## Typical operation (4)

### Class, C RF amplifier or oscillator, CW

Frequency	60	60	MHz
Anode voltage	6.5	5.5	kV
Grid bias	- 215	- 205	V
Grid voltage	540	530	V
Anode current (5)	2	1.9	A
Grid current (5)	0.87	0.86	A
Anode input power	13	10.5	kW
Anode output power (oscillator)	9.3	7.4	kW
Anode dissipation (5)	3.3	2.7	kW
Grid dissipation (5)	240	235	W
Grid drive power (6) (circuit losses not included)	430	415	W
Grid resistance (oscillator)	250	240	

(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

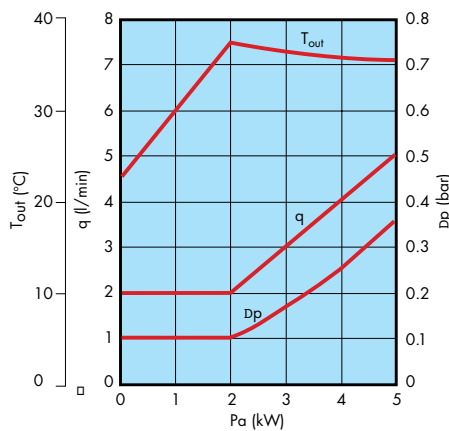
$\Delta p$  : pressure drop across the water cooler

$q$  : water flow rate

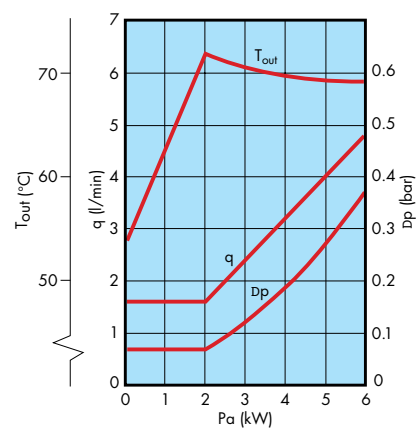
$T_{out}$  : outlet water temperature

(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

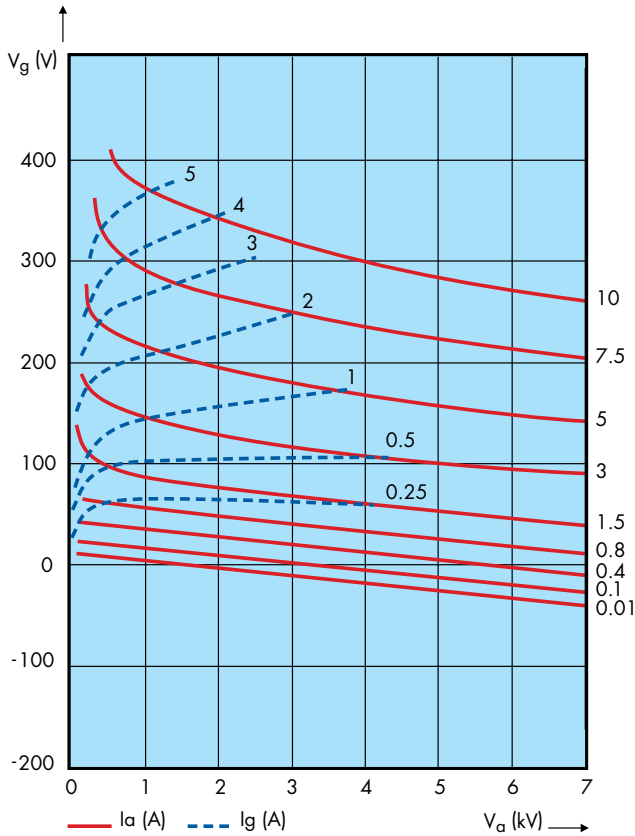


### Distilled or deionized water - minimum resistivity : 50 kΩ.cm

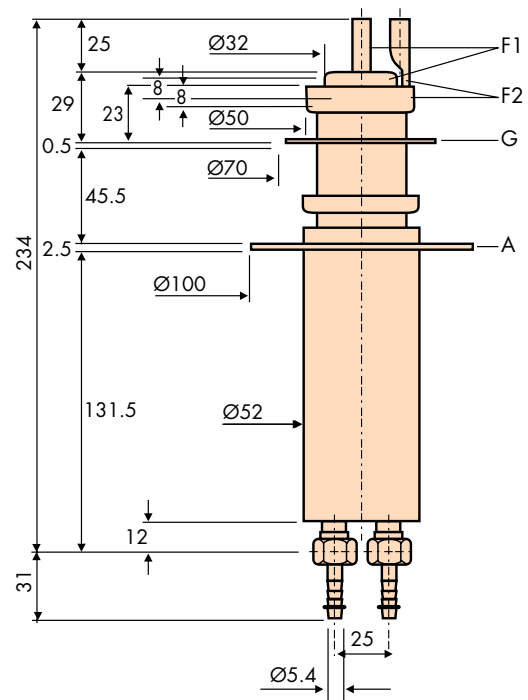


# CTK 5-1 CTK 5-2

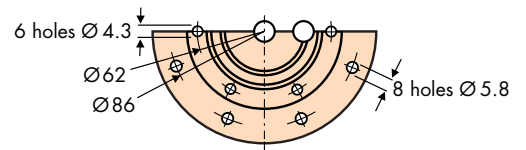
Constant current characteristics



CTK 5-1 outline drawing (dimensions in mm)



Top view (dimensions in mm)



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For further information, please contact:

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