

ITK 120-2 ITK 120-3

Water cooled triode

425 kW

- Output power:
425 kW in CW mode
- Anode voltage:
ITK 120-2: 18 kV
ITK 120-3: 20 kV
- Anode dissipation: 150 kW
- Frequency up to 30 MHz





ITK 120-2

The ITK 120-2 and the ITK 120-3 are high-power triodes designed specifically for industrial applications.

These tubes use a coaxial design and metal-ceramic technology. These triodes are 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 120-2 and the ITK 120-3 are water cooled triodes.

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

Electrical characteristics

Filament	thoriated tungsten		
Filament voltage (+ 5 %, - 10 %) (1)	18	V	
Filament current	330	A	
Surge current	1 300	A	max.
Cold resistance	6	m	
Capacitances :			
• grid-anode	75	pF	
• grid-cathode	180	pF	
• cathode-anode (2)	4.5	pF	
Amplification factor	27		approx.
Transconductance (Va: 10 kV, Ia: 20 A)	170	mA/V	approx.

Mechanical characteristics

Operating position	vertical, anode up or down		
Weight	18	kg	approx.
Dimensions	see outline drawing		

Maximum ratings

Frequency (3)	30	MHz	
Anode voltage:			
• ITK 120-2:			
up to 15 MHz	18	kV	
from 15 to 30 MHz	15	kV	
• ITK 120-3:			
up to 15 MHz	20	kV	
Control grid voltage	- 1 500	V	
Anode current	36	A	
Control grid current:			
• at full load	6	A	
• at no load	7.5	A	
Peak cathode current, CW	200	A	
Anode dissipation :			
• industrial cooling water	150	kW	
• distilled or deionized water	150	kW	
Grid dissipation :			
• up to 10 MHz	3.6	W	
• from 15 to 30 MHz	3.2	W	
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 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	2	m ³ /min	

Typical operation (4)

Examples	Class C RF oscillator for industrial applications		
	1	2	
Frequency	15	30	MHz
Anode voltage	17	15	kV
Grid bias	- 1 000	- 920	V
Grid voltage	1 650	1 570	V
Anode current	33	32	A
Grid current, on load	4.8	5.1	A
Anode input power	561	480	kW
Anode output power	425	360	kW
Anode dissipation	130	112	kW
Grid dissipation	2.7	2.9	kW
Grid resistance	210	180	
Feedback ratio	10.7	11.6	%
Oscillator efficiency	76	75	%

(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

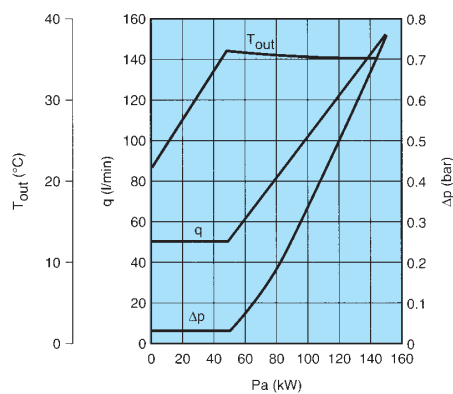
Δp : pressure drop across the water cooler

q : water flow rate

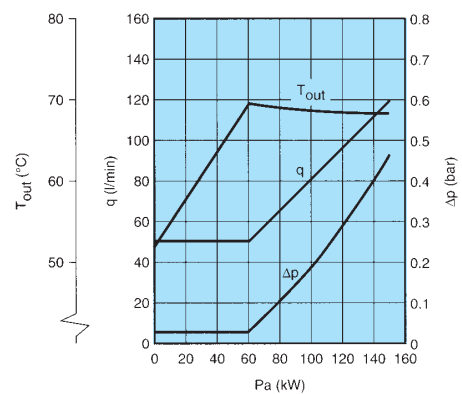
T_{out} : outlet water temperature

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

Industrial water - minimum resistivity : 5 k Ω .cm

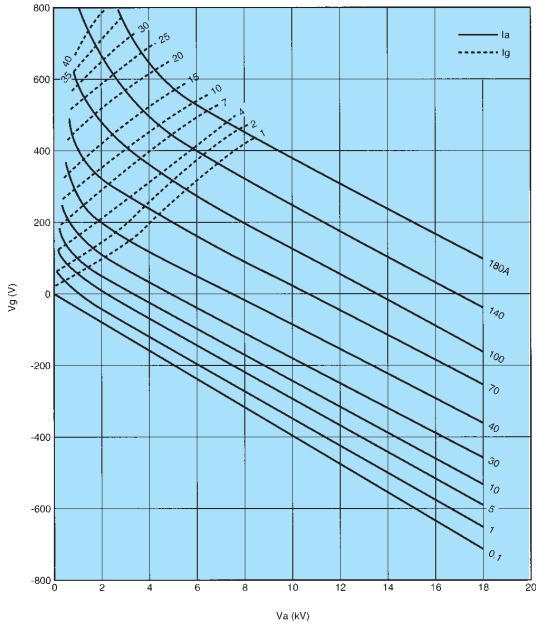


Distilled or deionized water - minimum resistivity : 50 k Ω .cm

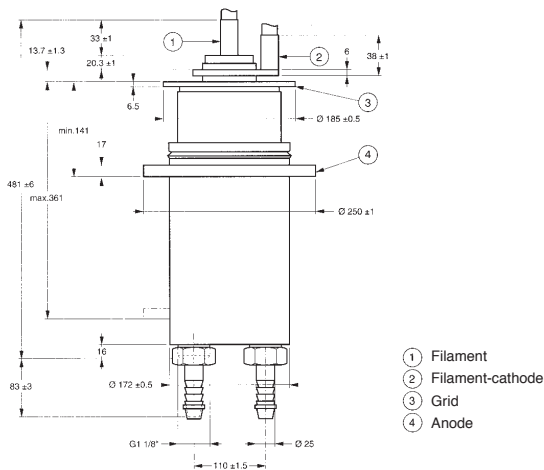


Constant current characteristics

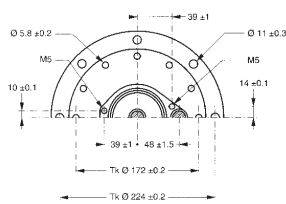
ITK 120-2 ITK 120-3



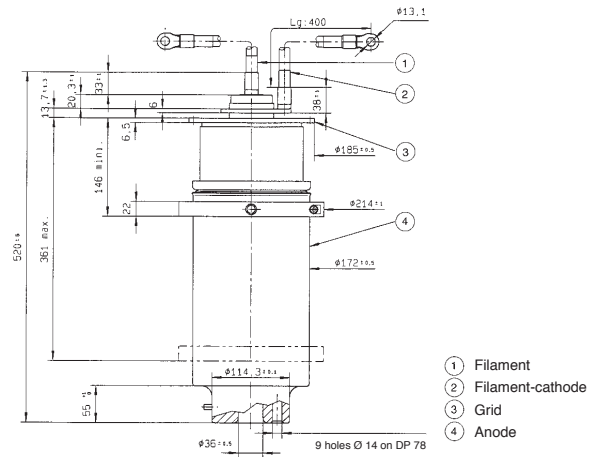
ITK 120-2 - Outline drawing (dimensions in mm)



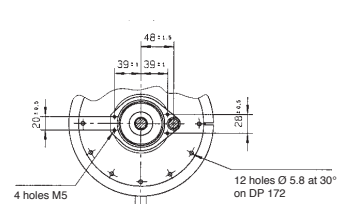
ITK 120-2 - Top view (dimensions in mm)



ITK 120-3 - Outline drawing (dimensions in mm)



ITK 120-3 - Top view (dimensions in mm)



This document cannot be considered to be a contractual specification. The information given herein may be modified without notice due to product improvement or further development. Consult Thales Electron Devices before making use of this information for equipment design.

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