

5 kW

- Output power:  
5 kW in CW mode
- Anode voltage: 7.2 kV
- Anode dissipation: 1.5 kW
- Frequency up to 160 MHz



# INDUSTRIAL RF HEATING



ITL 2-1

**T**he ITL 2-1 is a RF 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 ITL 2-1 is an air 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)	6.3	V
Filament current	35	A
Surge current	125	A max.
Cold resistance	22	mΩ
Capacitances:		
• grid-anode	14	pF
• grid-cathode	17	pF
• cathode-anode (2)	0.5	pF
Amplification factor	21	approx.
Transconductance (Va: 4 kV, Ia: 1 A)	10	mA/V approx.

## Mechanical characteristics

Operating position	vertical, anode up or down	
Weight	1.1	kg approx.
Dimensions	see outline drawing	

## Maximum ratings

Frequency (3)	160	MHz
Anode voltage:		
• up to 85 MHz	7.2	kV
• from 85 to 160 MHz	6	kV
Control grid voltage	- 1 000	V
Anode current	1.2	A
Control grid current:		
• at full load	0.28	A
• at no load	0.4	A
Peak cathode current	7.5	A
Anode dissipation, inlet air temperature = 45°C	1.5	kW
Grid dissipation:		
• up to 85 MHz	130	W
• from 85 to 160 MHz	100	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 60 MHz. Please consult Thales Electron Devices.

## Cooling

Anode cooling	forced air		
Inlet air temperature	45	°C	max.
Cooling air flow	1	m <sup>3</sup> /min	min.
Temperature at any point on tube envelope	220	°C	max.

## Typical operation (4)

Examples	Class C RF oscillator for industrial applications		
	1	2	
Frequency	30	30	MHz
Anode voltage	6	5	kV
Grid bias	- 470	- 420	V
Grid voltage	790	760	V
Anode current	1.1	1.1	A
Grid current, on load	0.24	0.27	A
Anode input power	6.6	5.5	kW
Anode output power	5.0	4.1	kW
Anode dissipation	1.5	1.2	kW
Grid dissipation	65	77	W
Grid resistance	1 900	1 500	Ω
Feedback ratio	14.6	16.6	%
Oscillator efficiency	75	75	%

(4) Operation with higher frequencies on request.

## Cooling curve

The required flow rates and pressures drop may be read off the cooling curve.

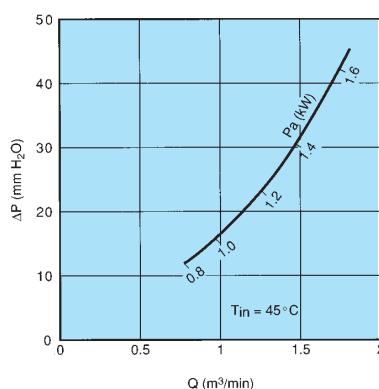
This is valid for both air-flow directions.

$P_a$ : anode dissipation

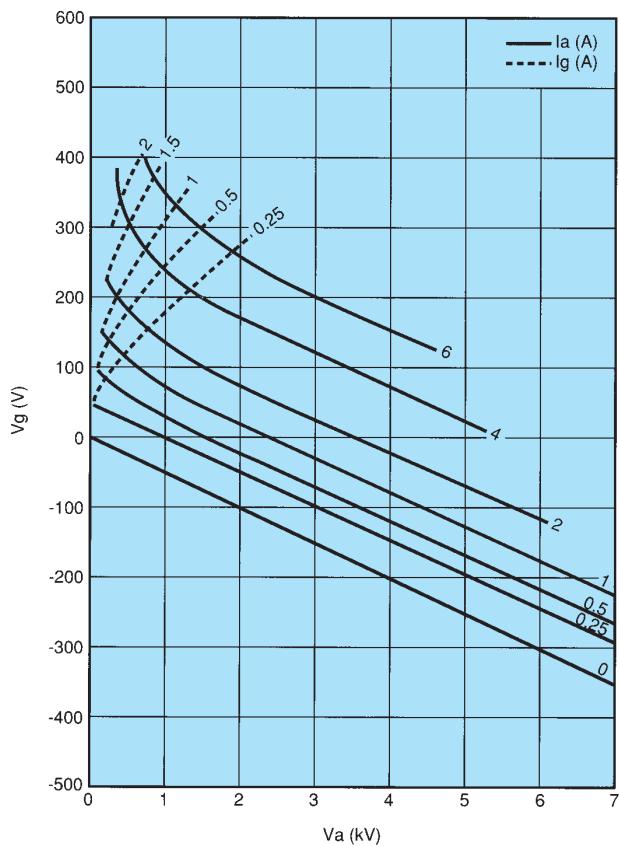
$\Delta P$ : pressure drop across the cooler fins

$q$ : air flow rate

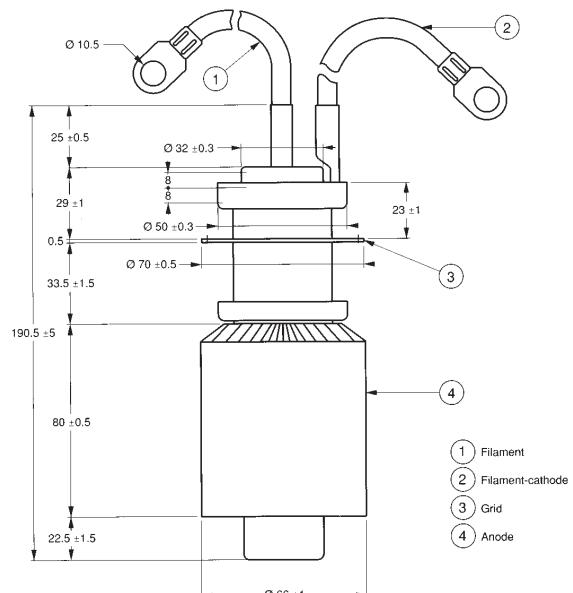
$T_{in}$ : inlet air temperature



Constant current characteristics



Outline drawing (dimensions in mm)



Top view (dimensions in mm)

