

# PET12-1W

Water Cooled Triode  
For Industrial RF Heating

Drop in equivalent of ITK 12-1

- Output Power: 40 kW in CW
- Anode voltage: 12 kV
- Anode dissipation: 15 kW
- Frequency up to 120 MHz

Manufactured in India, in a world-class facility equipped with high quality machinery, materials and components sourced from reputed suppliers in America, Europe and Japan.

Fifty-two weeks warranty against manufacturing defects irrespective of the number of hours of operation.



# PET12-1W

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The PET12-1W 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 PET12-1W is a water cooled triode.

## Electrical characteristics

Filament	thoriated tungsten
Filament voltage (+ 5 %, - 10 %) (see note 1)	5.8 V
Filament current	145 A
Surge current (maximum)	600 A
Cold resistance	5 mΩ
Capacitances:	
• Grid to Anode	21 pF
• Grid to Cathode	55 pF
• Cathode to Anode (see note 2)	1 pF
Amplification factor	22 (approx.)
Transconductance (Va: 10 kV, Ia: 4 A)	50 mA/V (approx)

## Mechanical characteristics

Operating position	vertical, anode up or down
Weight	3.1 kg (6.8 lbs) approx.
Dimensions	see outline drawing

## Maximum ratings

Frequency (see note 3)	120 MHz
Anode voltage:	
• Up to 30 MHz	12 kV
• From 30 to 60 MHz	9 kV
• From 60 to 90 MHz	7 kV
• From 90 to 120 MHz.	6 kV
Control grid voltage	-1500 V
Anode current	5.5 A
Control grid current:	
• At full load	0.8 A
• At no load	1.5 A
Peak cathode current, CW	28 A
Anode dissipation:	
• Industrial cooling water	13 kW
• distilled or deionized water	15 kW
Grid dissipation:	
• Up to 30 MHz	350 W
• From 30 to 60 MHz	320 W
• From 60 to 90 MHz	300 W
• From 90 to 120 MHz.	280 W
Grid resistance (tube non conducting)	10 KΩ

**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 m3/min

**Typical operation (see note 4)**

**Class C RF oscillator for industrial applications**

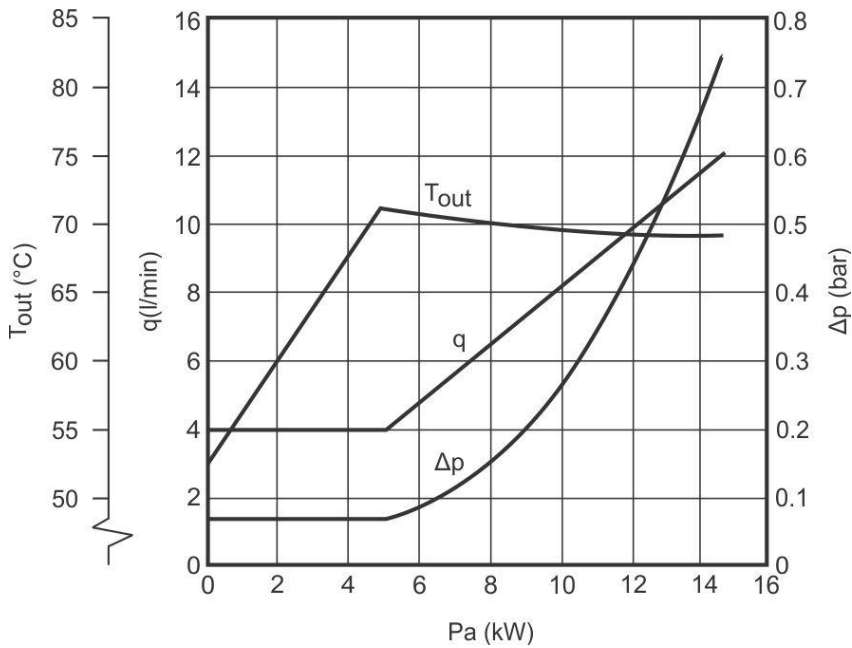
Frequency . . . . .	30	30	MHz
Anode voltage . . . . .	10	8	kV
Grid bias . . . . .	- 650	- 560	V
Grid voltage . . . . .	1050	945	V
Anode current . . . . .	5.3	4.8	A
Grid current, on load . . . . .	0.69	0.76	A
Anode input power . . . . .	53	38.4	kW
Anode output power . . . . .	40	29	kW
Anode dissipation . . . . .	12	8.6	kW
Grid dissipation . . . . .	240	260	W
Grid resistance . . . . .	1000	740	Ω
Feedback ratio . . . . .	11.7	13.1	%
Oscillator efficiency . . . . .	.75.5	76	%

**Note:**

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 Pilani Electron Tubes & Devices.
4. Operation with higher frequencies on request.

**Cooling curves**

**Distilled or deionized water – minimum resistivity: 50 kΩ.cm**



Distilled, deionized or tap (industrial) 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

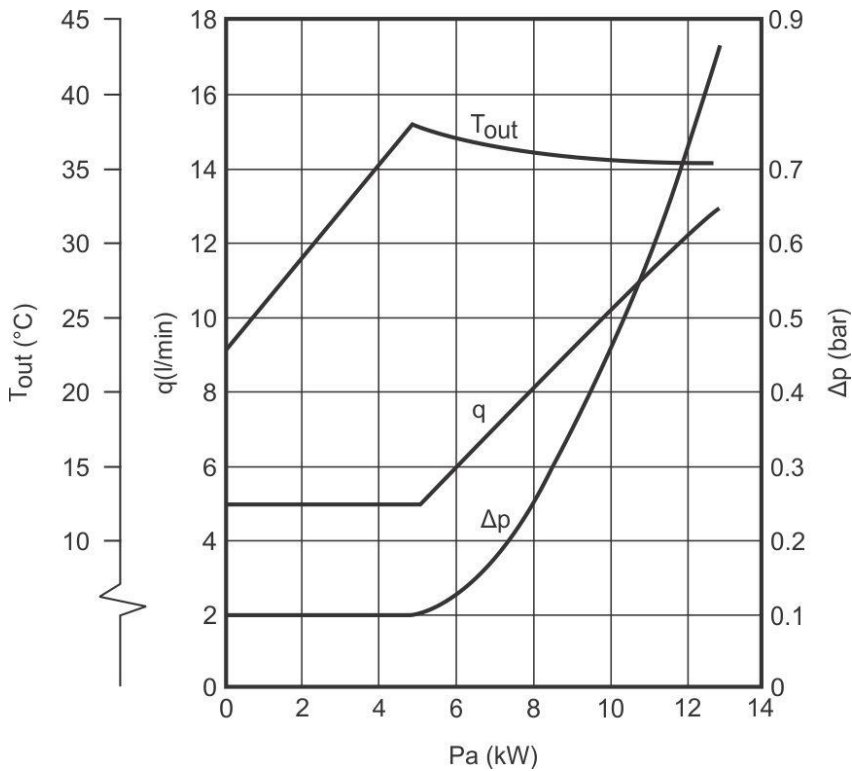
Δp: pressure drop across the water cooler

q: water flow rate

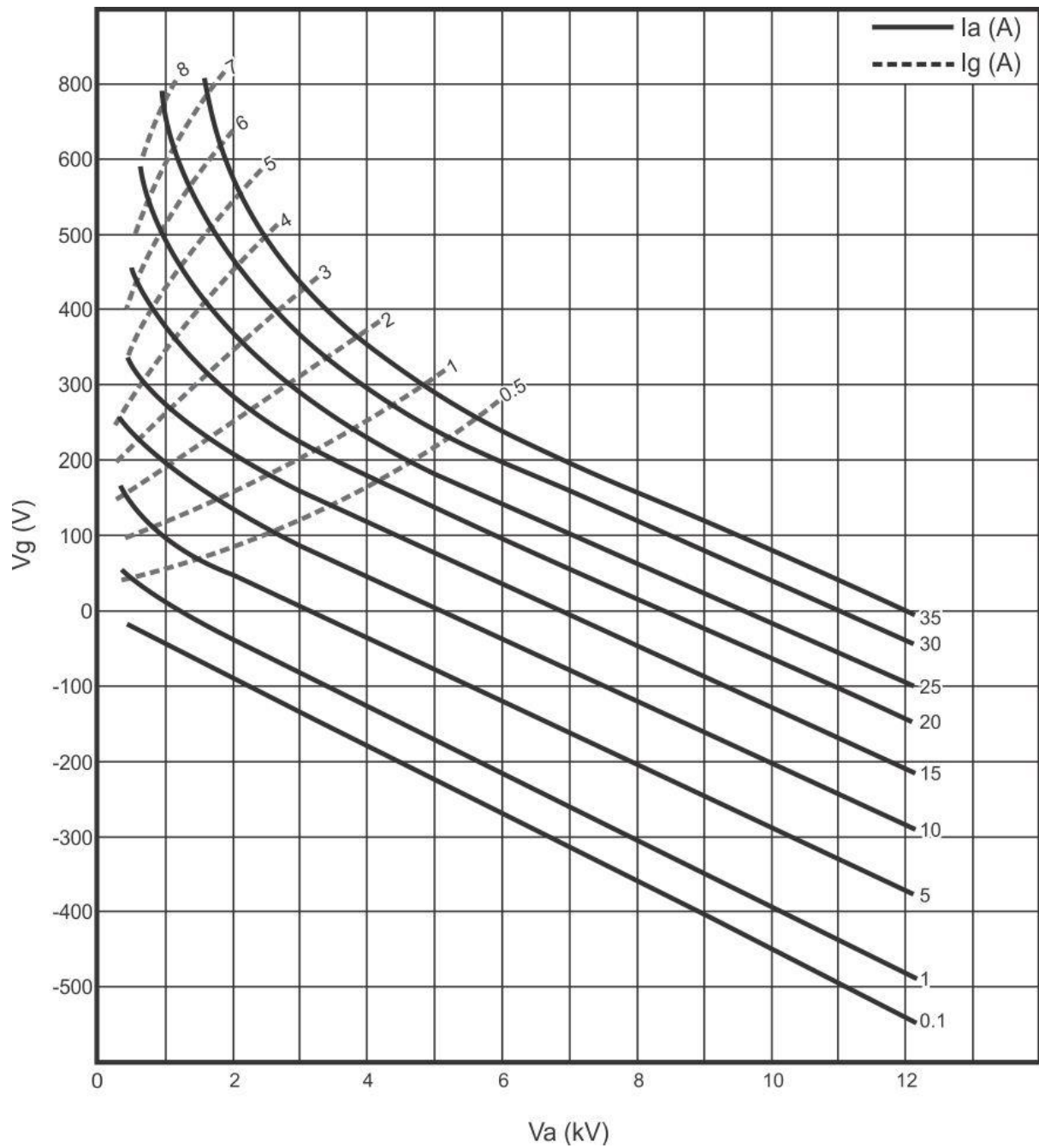
Tout: outlet water temperature

(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**

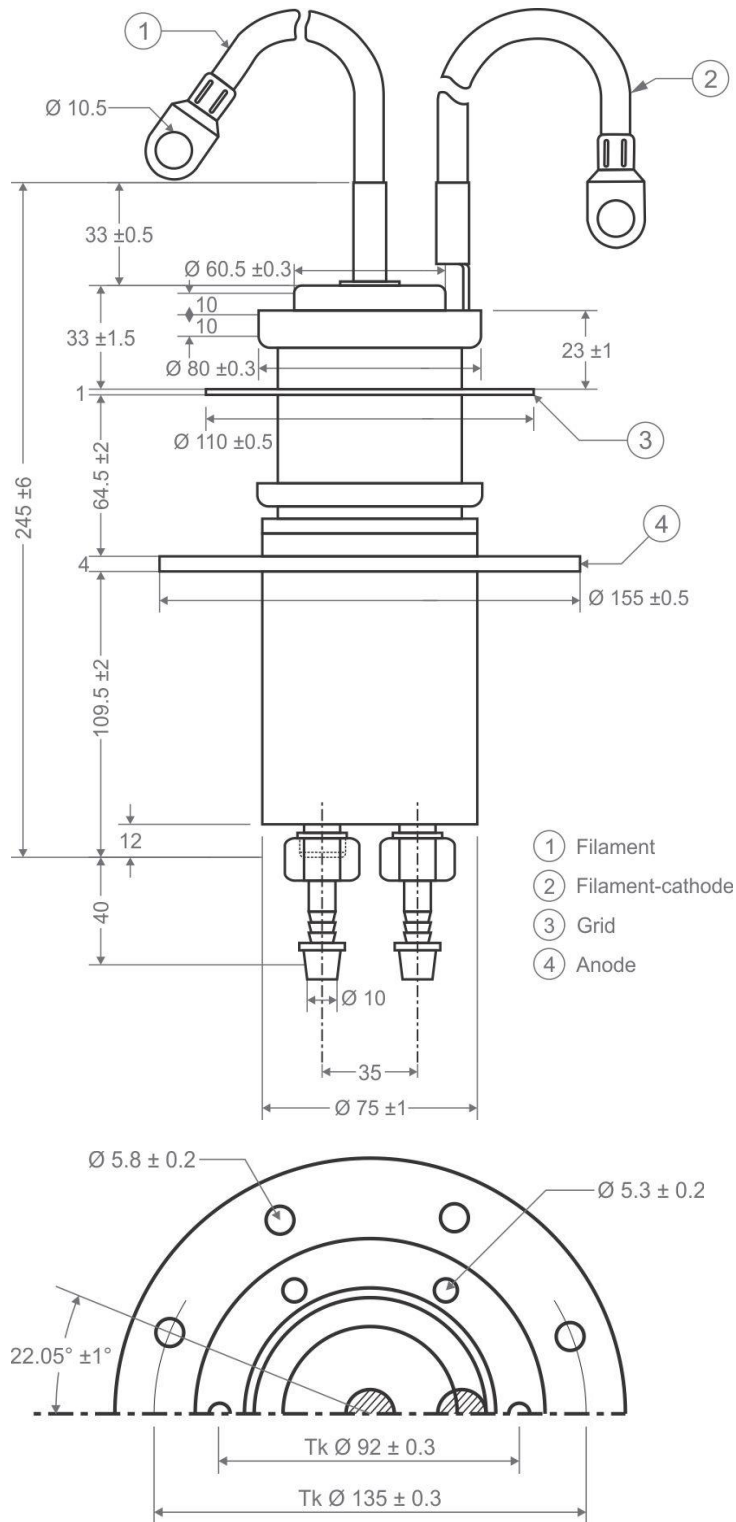


Constant current characteristics



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## Outline diagram (in mm)



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