PET1617F

Air Cooled Triode
For Industrial RF Heating

Drop in equivalent of BR1617F

- Output Power: 38 kW
- Anode voltage: 10 kV max
- Anode dissipation: 10 kW max
- Frequency: 30 MHz max

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.

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Air-cooled R.F. power triodes of coaxial ceramic-metal construction. It is intended primarily for industrial R.F. heating machines.

Electrical Characteristics

Filament	Thoriated tungsten (Mesh Type)
Filament voltage (see note 1)	6.3 Volts
Filament Current	160 Amps
Filament cold resistance.	5.3 mΩ
Peak usable cathode current	30 Amp
Perveance	4.5 $mA/V^{3/2}$
Amplification factor (Va = 2.25 kV, Ia = 1.0 A)	23
Mutual conductance (Va = 2.25 kV, Ia = 1.0 A)	40 mA/V
Inter-electrode capacitances:	
Grid to anode	36 pF
Grid to filament	78 pF
Anode to filament	2.0 pF

Mechanical Characteristics

Overall dimensions	See outline drawing
Net weight:	4.3 kg (9.5 pounds) approx
Mounting position	Vertical, either way up

Accessories

Cathode Connector	PA830

For frequencies above 2 MHz, PA830 should be used in conjunction with a strip connection to provide a low inductance cathode return.

Cooling

The required air flow should be delivered through the radiator immediately before and during the application of any voltages. Filament power, anode power and air flow may be removed simultaneously.

Filament and Grid Seals

The temperature of the filament and grid seals must not exceed 200 °C. A flow of air of 15ft^3/min (0.43m^3/min) directed onto the terminals via a 1-inch (25 mm approx) diameter nozzle from a distance of 6 inches before and during the application of any voltages is usually adequate for limiting the temperature of the seals.

Radio Frequency Oscillator For Industrial Service

(Class C Conditions, One Tube)

Maximum Ratings (Absolute Values)

Anode voltage	10 kV max
Anode current	6.0 Amp max
Anode dissipation (continuous service).	10 kW max
Grid voltage (negative value)	–1.5 kV max
Off-load grid current	1.6 Amax
Grid dissipation	600 W max
Frequency	30 MHz max

Operating Conditions
(At maximum anode current)

Anode Voltage . .	9.5	9.0	8.0	7.0	6.0	kV
Grid voltage . .	–800	–775	–700	–600	–520	V
From grid resistor .	800	720	640	540	445	Ω
Peak r.f. grid drive voltage	1150	1135	1050	940	860	V
Peak positive grid voltage	350	350	350	340	340	V
Anode current . .	5.0	5.0	5.0	5.0	5.0	A
Grid current . .	1.0	1.08	1.1	1.12	1.17	A
Anode dissipation .	8.0	7.7	7.3	6.8	6.4	kW
Grid dissipation . .	350	390	380	380	398	W
Driving power . .	1150	1226	1155	1050	1006	W
Feedback ratio (see note 2)	13.1	13.7	14.5	15	16.1	%
Anode output power .	39.0	37.1	32.7	28.2	23.7	kW
Anode efficiency .	83.1	82.7	81.6	80.6	78.7	%
Oscillator output power (See note 3) .	37.9	35.9	31.5	27.1	22.7	kW
Oscillator efficiency .	80.7	80.0	78.9	77.6	75.4	%
Load resistance . .	980	920	805	700	600	Ω

Operating Conditions
(With reduced input power)

Anode voltage .	9.5	9.0	8.0	7.0	6.0	kV
Grid voltage . .	–800	–775	–700	–600	–520	V
From grid resistor .	1265	1225	1060	880	655	Ω
Peak r.f. grid drive voltage	1075	1050	975	860	795	V
Peak positive grid voltage	275	275	275	260	270	V
Anode current . .	3.5	3.5	3.5	3.5	3.5	A
Grid current . .	630	630	660	685	790	mA
Anode dissipation .	5.3	5.1	4.7	4.6	4.1	kW
Grid dissipation . .	174	174	180	177	218	W
Driving power . .	680	665	645	587	630	W
Feedback ratio (see note 2)	12.3	12.7	13.4	13.7	14.7	%
Anode output power .	28.2	26.1	23.2	20.0	17.0	kW
Anode efficiency .	84.2	83.7	83.0	81.3	80.8	%
Oscillator output power (See note 3) .	27.6	25.5	22.5	19.4	16.4	kW
Oscillator efficiency .	82.2	81.5	80.7	80.6	77.9	%
Load resistance . .	1355	1300	1150	990	840	Ω

NOTES

1. The tube must be operated at the stated filament voltage. Fluctuation in filament voltage must not exceed ±5%. The filament may be switched on at its operating voltage and no surge limiting devices need be incorporated in the filament circuit. The voltage drop in the integral filament leads is less than 1% of the filament voltage.
2. The feedback ratio is defined as Vg(pk)/V_a(pk) X 100 where $V_{g(pk)}$ = peak r.f. grid voltage in volts and Va(pk) = peak r.f. anode voltage in volts.
3. Oscillator output power = $P_{out} – P_{drive}$
   Where P_{out} = output power of tube to anode circuit
   and P_{drive} = drive power fed back to grid circuit.

Health And Safety Hazards

PET electronic devices are safe to handle and operate, provided that the precautions stated are observed. PET does not accept responsibility for damage or injury resulting from the use of electronic devices it produces. Equipment manufacturers and users must ensure that adequate precautions are taken. Appropriate warning labels and notices must be provided on equipments incorporating PET devices and in operating manuals.

High voltage

Equipment must be designed so that personnel cannot come into contact with high voltage circuits. All high voltage circuits and terminals must be enclosed and fail-safe interlock switches must be fitted to disconnect the primary power supply and discharge all high voltage capacitors and other stored energy before allowing access. Interlock switches must not be bypassed to allow operation with access doors open.

R.F. Radiation

Personnel must not be exposed to excessive r.f. radiation. A properly designed equipment cabinet with good r.f. electrical connection between panels will normally provide sufficient protection.

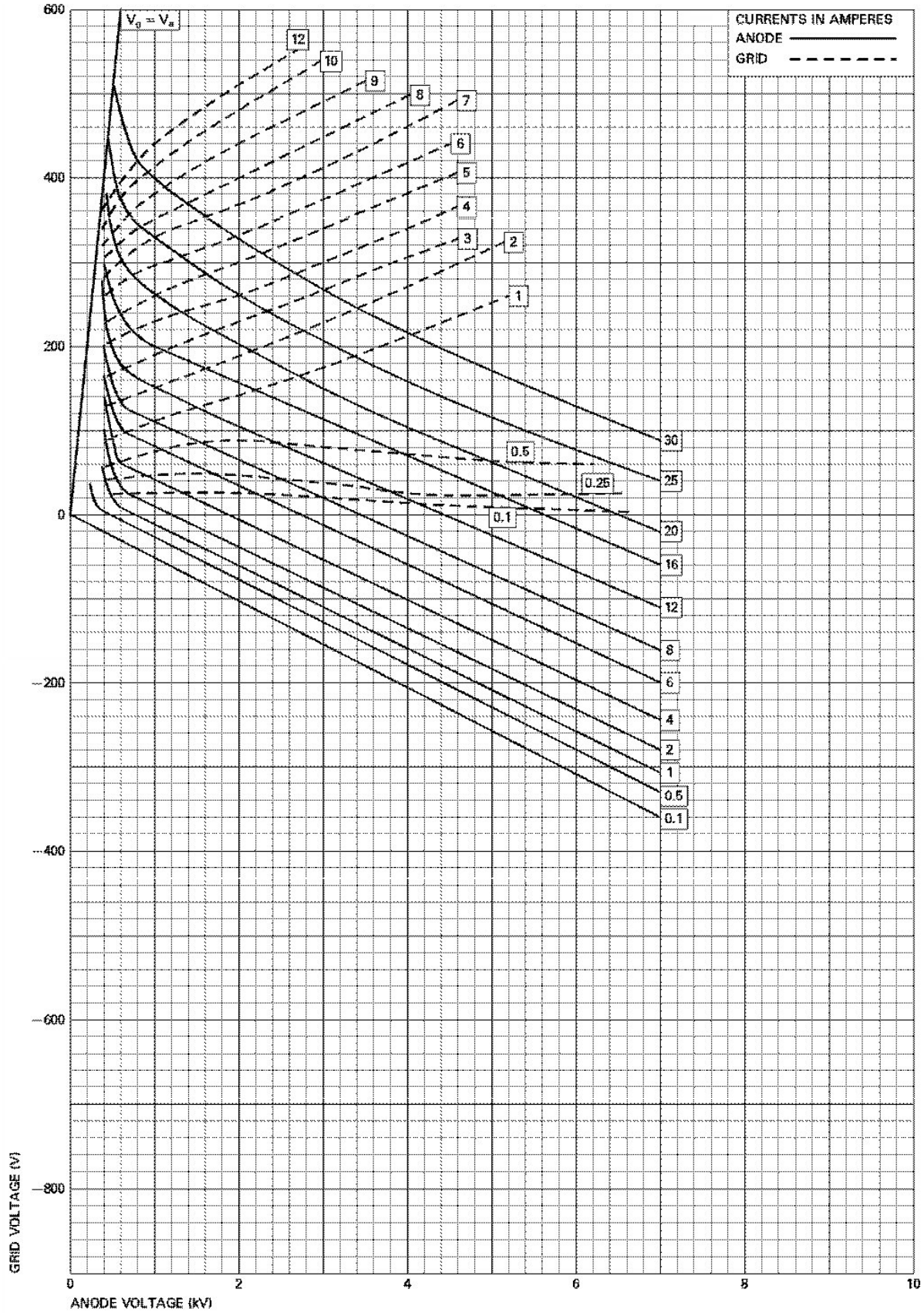
X-Ray Radiation

This device, when operating at voltages above 5 kV, produces progressively more dangerous X-rays as the voltage is increased, the radiation varies greatly during life. The device envelope provides only limited protection and further shielding may be required. A metal equipment cabinet with overlapping joints will usually provide sufficient shielding, but if there is any doubt an expert in this field should perform an X-ray survey of the equipment.

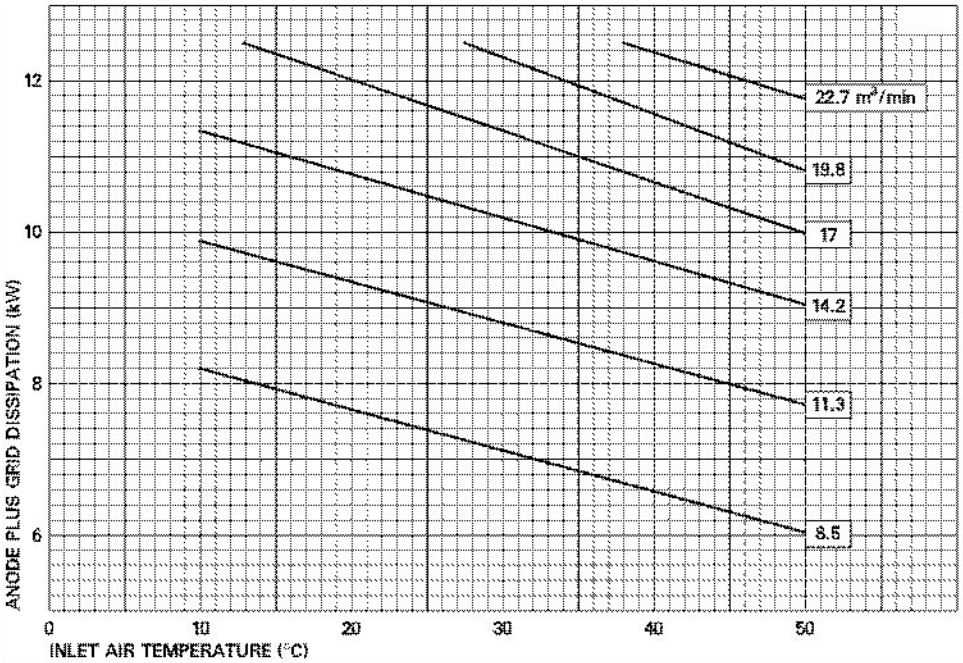
Implosion

This tube stores potential energy by virtue of its vacuum. The energy level is low, but there is some hazard from flying fragments if the tube is dropped or subjected to violent impact. The tube must be stored and transported in its approved pack. During installation or replacement the tube must not be scratched or damaged in any way likely to reduce the strength of the ceramic envelope.

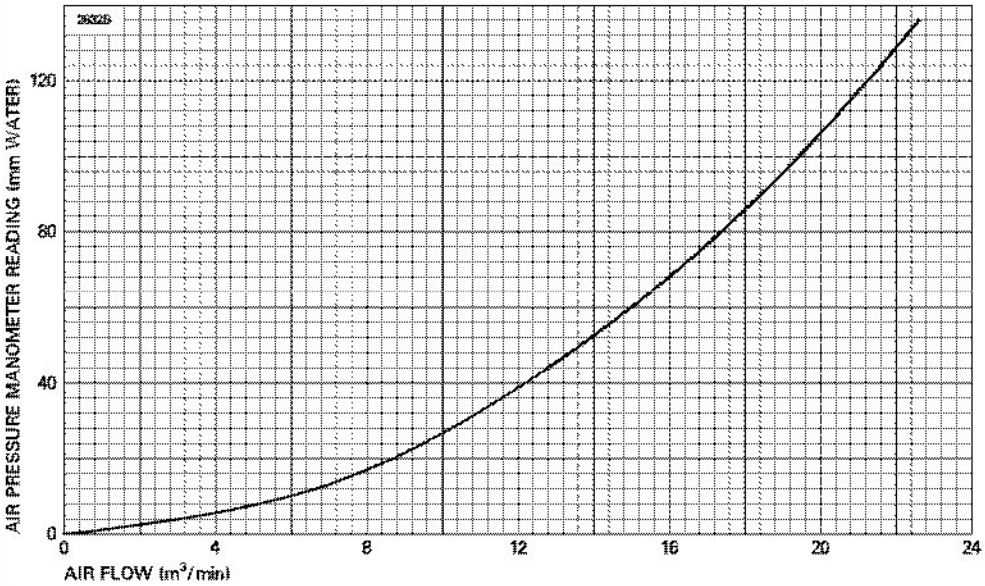
Typical Constant Current Characteristics



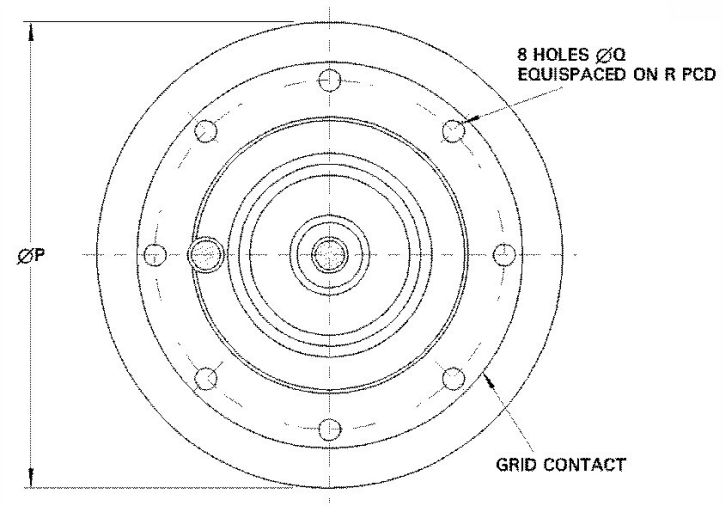
Air Cooling Requirements



Typical Air Flow Characteristic



Outline Drawing
(All Dimensions Without Limits Are Nominal)



Ref	Millimetres
A	46.6
B	68.0 ± 0.5
C	79.0 ± 1.5
D	1.5
F	212.0
G	325.0 ± 15.0
H	3.0
J	19.0
K	10.5 ± 0.1
L	63.0
M	96.0 ± 0.2
N	133.25 ± 0.50
P	159.0
Q	6.5
R	119.0 ± 0.1