PET1185J2

Water Cooled Triode
For Industrial RF Heating

Drop in equivalent of BW1185J2 & YD1212

- Output Power: 240 kW
- Anode voltage: 16.8 kV max
- Anode dissipation: 120 kW max
- Frequency up to 30 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.

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The PET1185J2 is a water cooled power triode of coaxial ceramic-metal construction. It is intended primarily for industrial RF heating machines. It has an integral water jacket.

Electrical Characteristics

Filament	Thoriated Tungsten
Filament voltage (see note 1)	12.6 V
Filament current.	380 A
Surge filament current (peak) (See note 2)	2000 A max
Filament cold resistance.	3.6 mΩ
Peak usable cathode current	175 A
Amplification factor (V_a = 14 kV, I_a = 10 A)	40
Mutual conductance (Va = 14 kV, I_a = 10 A).	190 mA/V
Inter – electrode capacitances:	
Grid to anode	60 pF
Grid to filament	185 pF
Anode to filament	3.0 pF

Mechanical Characteristics

Overall length (Excluding leads)	446.00mm (17.560 inches) max
Overall diameter	190.5mm (7.500 inches) max
Net weight	15.6 kg (34.4 pounds) approx
Mounting position (see note 3)	Vertical, anode up or down

Accessories

Water coupling, 2 supplied with tube	MA709B
Water union, 25 mm hose (optional)	MA2654A
Filament connector (with lead)	MA475A
Filament connector (without lead)	MA291C
Filament/cathode connector (with lead)	MA475B
Filament/cathode connector (without lead)	MA291D

For frequencies above 2 MHz, cathode connector MA291F should be used in conjunction with a strip connection to provide a low inductance cathode return

Grid connector	MA342
Thermal fuse	MA85G

The tightening torque applied to the clamping screw must be between the limits of 20 lb.in (0.231 kg.m) min, 35 lb.in(0.404 kg.m) max.

Cooling

The PET1185J2 has an integral water jacket. The water cooling requirements are given in the following table.

Anode plus grid dissipation (kW)	inlet temperature (^{0}C)	minimum rate of flow of water		inlet pressure (atm)	Outlet temperature (^{o} C)
		l. /min	imp.gal/min		
120	20	60	13.2	0.7	50
120	50	90	19.8	1.3	70
80	20	34	7.5	0.3	55
80	50	54	11.9	0.55	72
40	20	15	3.3	0.07	62
40	50	24	5.3	0.13	76

The inlet water temperature must never exceed 50 ^{0}C. The water pressure must never exceed 600 kPa(87 lb/in_2).

The temperature of the seals and envelope must not exceed 200 ^{0}C. Cooling of the seals by low velocity air flow or water cooled filament connectors is required.

Radio Frequency Oscillator For Industrial Service

(Class C conditions, one tube)

Maximum Ratings (Absolute values)

Frequency	30	MHz
Anode voltage	16.8	kV max
Anode input power	375	kW max
Anode dissipation	120	kW max
Grid voltage (negative value)	2.0	kV max
Grid current:		
On load	7.0	A max
Off load	8.5	A max
Grid dissipation	3.0	kW max
Grid circuit resistance	10	kΩ max
Cathode current	31	A max

Typical Operating Conditions

Frequency	30	30	30	MHz
Anode voltage	10	12	14	kV
Anode current	23.6	24.7	23.5	A
Anode dissipation	56.6	67.4	81.5	kW
Grid voltage	-580	-695	-810	V
Grid resistor	87	108	135	Ω
Grid current, on load	6.7	6.4	6.0	A
Grid current, off load	8.4	8.0	8.0	A
Grid dissipation	2.6	2.6	2.6	kW
Feedback ratio	9.1	10.5	11	%
Drive power	6.4	7.1	7.5	kW
Output power	179.4	229.3	247.5	kW
Efficiency	76.0	77.3	75.2	%
Oscillator output power (See note 5).	173.0	222.2	240	kW

NOTES

1. Temporary fluctuations up to +5% or -10% in filament voltage are permissible.
2. The filament current must not exceed 2000 A, even momentarily, at any time.
3. If the tube is mounted with the anode uppermost, the water inlet and outlet connections should be reversed (see outline).
4. the feedback ratio is defined as $\frac{V_{g(pk)}}{V_{a(pk)}} X\ 100$

   Where $V_{g(pk)}$ = peak r.f. grid voltage in volts

   And $V_{a(pk)}$ = peak r.f. anode voltage in volts
5. 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 started are observed. PET does not accept responsibility for damage or injury resulting from the 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 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.

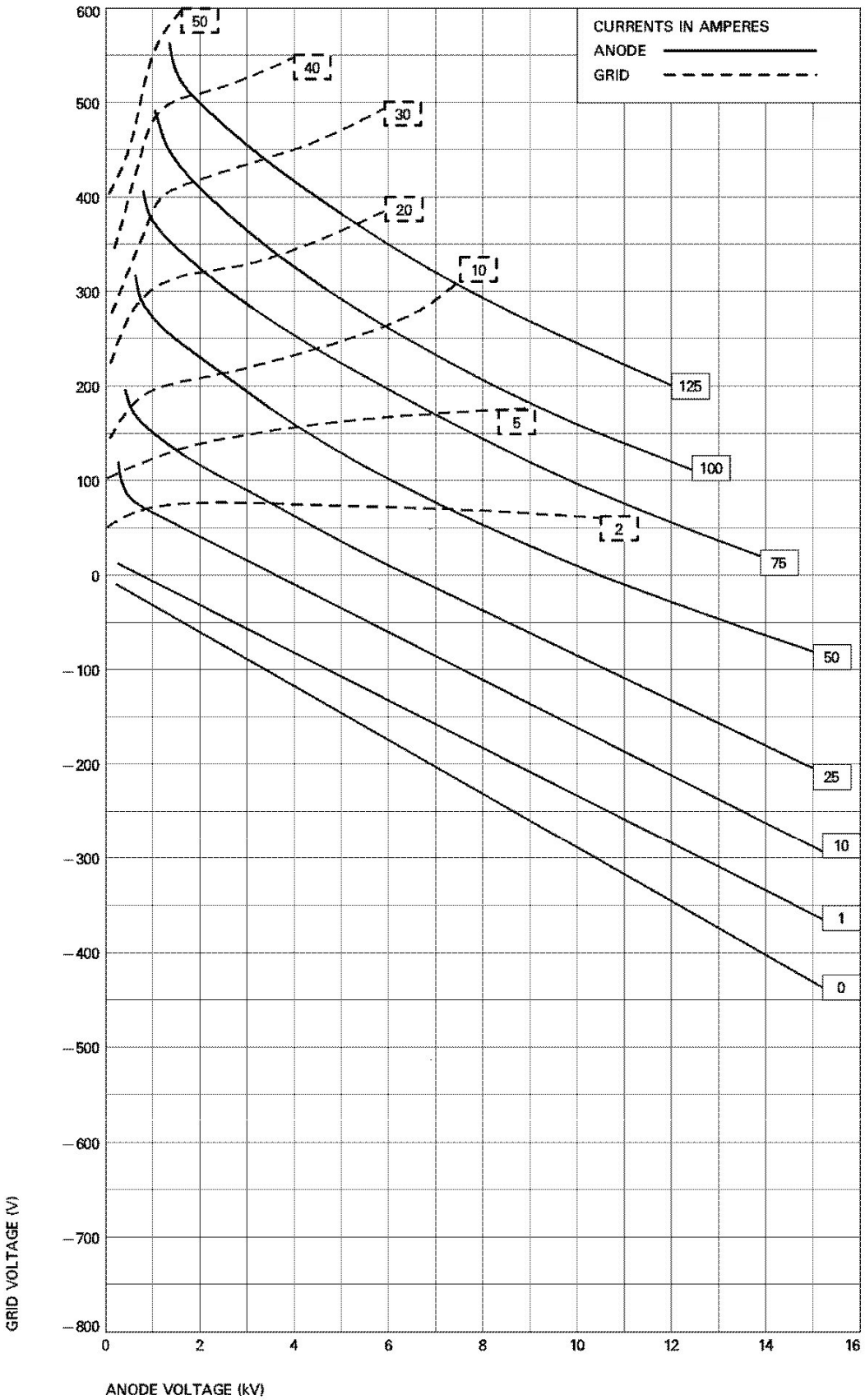
X-Ray Radiations

This device, when operating at voltage above 5 kV, produces progressively more dangerous X-ray 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

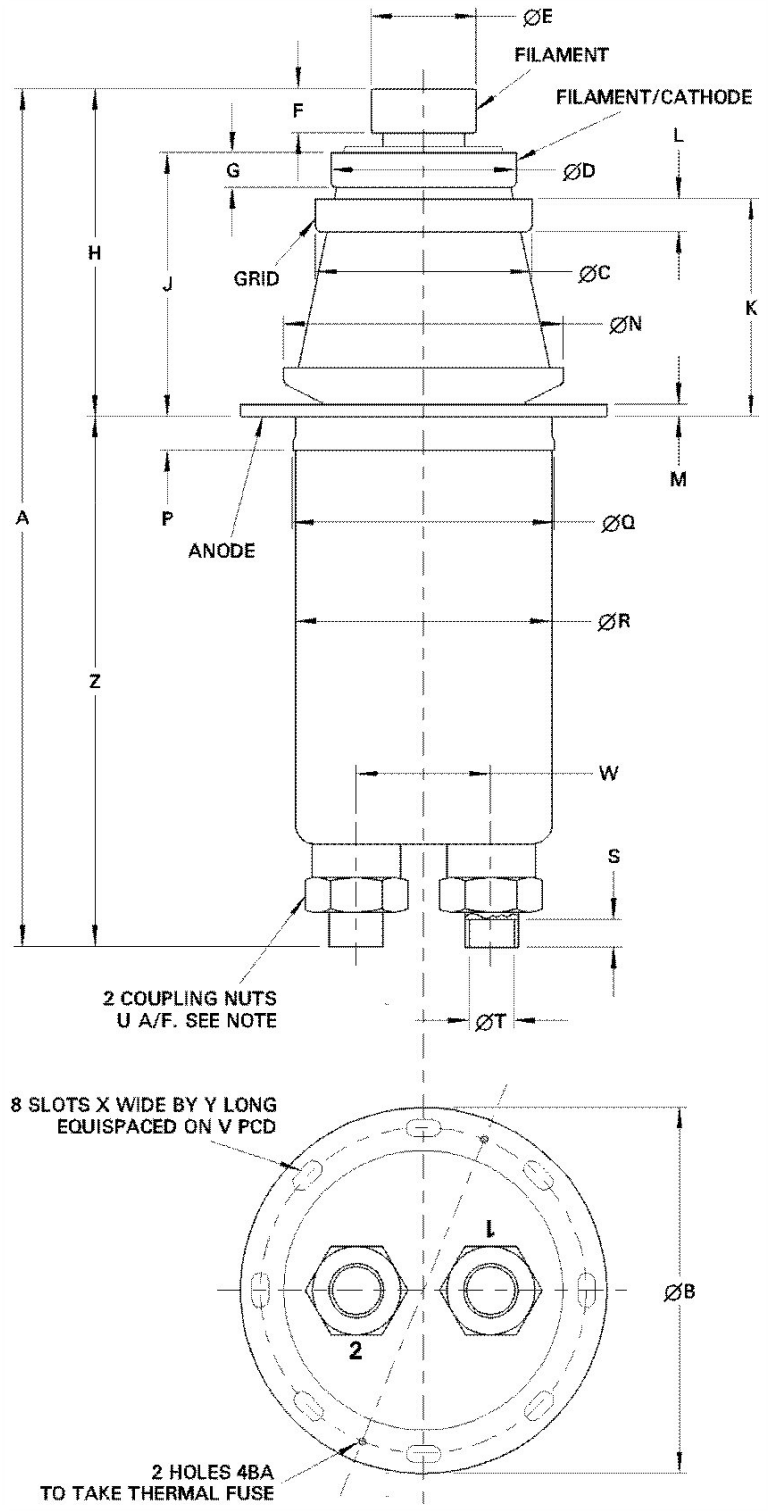
This tube stores potential energy by virtue of its vacuum. The energy level is low, but there is some hazard from flying fragments if the tube is dropped or subjected to violent impact. The tube must be stored and transported in its approved pack. During installation or replacement the tube must not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

Typical Constant Current Characteristics



Outline Diagram

(All dimensions without limits are nominal)



Ref	Millimetres
A	446.0 max
B	190.5 max
C	112.0 ± 0.2
D	96.0 ± 0.2
E	54.00 ± 0.15
F	23.0
G	15.0
H	171.5 max
J	137.0
K	113.0
L	14.0
M	6.3
N	145.0 max
P	17.5
Q	148.0 max
R	143.0 ± 1.0
S	18.5
T	28.0
U	46.0
V	170.0
W	70.0
X	9.0
Y	18.0
Z	270.0

Outline Note

Suitable water pipe connectors are supplied with BW1185J2.

Water Connections

	Anode down	Anode up
Inlet	1	2
Outlet	2	1