BW1184J2

R.F. POWER TRIODE

The data should be read in conjunction with the Power Triode Preamble.

ABRIDGED DATA

The BW1184J2 is a water cooled power triode of coaxial ceramic/metal construction, intended primarily for industrial service. It has an integral water jacket.

Anode dissipation	80	kW max
Anode voltage	14.4	kV max
Frequency for full ratings	30	MHz max
Output power (class C oscillator, less drive)	120	kW

GENERAL

Electrical

Filament	thoriated tungsten	
Filament voltage (see note 1)	12.2	V
Filament current	255	A
Surge filament current (peak) (see note 2)	1500	A max
Filament cold resistance	5.3	mΩ
Peak usable cathode current	106	A
Amplification factor (V_a = 10 kV, I_a = 8.0 A)	30	
Mutual conductance (V_a = 10 kV, I_a = 8.0 A)	150	mA/V
Inter-electrode capacitances:		
grid to anode	55	pF
grid to filament	170	pF
anode to filament	2.7	pF

Mechanical

Overall length	446.0 mm (17.560 inches) max
Overall diameter	190.5 mm (7.500 inches) max
Net weight	11.5 kg (25.3 pounds) approx
Mounting position (see note 3)	vertical, anode up or down

March 1984

Supersedes February 1975 Issue

Accessories

Filament connector (with lead)†	MA475A
Filament connector (without lead)†	MA291C
Filament/cathode connector (with lead)†	MA475E
Filament/cathode connector (without lead)†	MA291D
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

Anode

The BW1184J2 has an integral water jacket. The water cooling requirements are given in the following table.

Anode plus grid dissipation (kW)	Inlet temperature (°C)	Minimum rate of flow of water		Inlet pressure (atm)	Outlet temperature (°C)
		l./min	imp.gal/min		
80	20	40	8.8	0.35	50
80	50	60	13.2	0.65	70
60	20	28	6.2	0.18	52
60	50	42	9.2	0.32	72
40	20	18	4.0	0.08	54
40	50	27	6.0	0.15	73

The inlet water temperature must never exceed 50 °C.

Seals and Envelope

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

★ Indicates a change.

RADIO FREQUENCY OSCILLATOR FOR INDUSTRIAL SERVICE
(Class C conditions, one tube)

MAXIMUM RATINGS (Absolute values)

Frequency	30	MHz
Anode voltage	14.4	kV max
Anode input power	220	kW max
Anode dissipation	80	kW max
Grid voltage (negative value)	2.0	kV max
Grid current:		
on load	4.0	A max
off load	5.5	A max
Grid dissipation	2.0	kW max
Grid circuit resistance	10	kΩ max
Cathode current	22	A max

TYPICAL OPERATING CONDITIONS

Frequency	30	30	MHz
Anode voltage	12	10	kV
Anode current	13	16	A
Anode dissipation	32.5	36	kW
Grid voltage	−892	−700	V
Grid resistor	330	200	Ω
Grid current, on load	2.7	3.5	A
Grid current, off load	3.5	4.8	A
Grid dissipation	1.1	1.5	kW
Feedback ratio (see note 4)	11	12	%
Drive power	3.5	4.0	kW
Output power	123.5	124	kW
Efficiency	79.2	77.5	%
Oscillator output power (see note 5)	120	120	kW

NOTES

1. Temporary fluctuations up to +5% or −10% in filament voltage are permissible.
2. The filament current must not exceed 1500 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.
4. The feedback ratio is defined as $\frac{V_{g(pk)}}{V_{a(pk)}} \times 100$

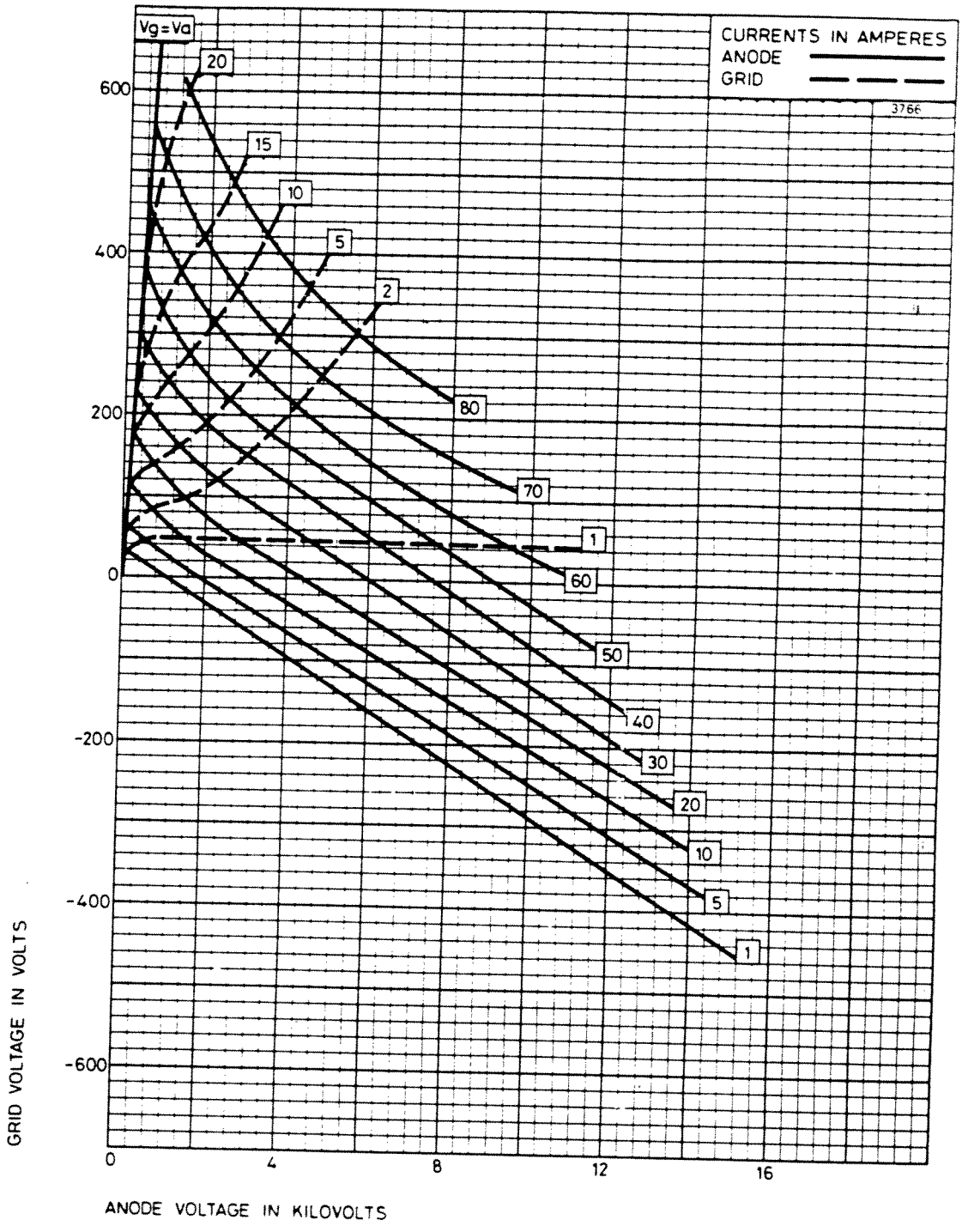
   where $V_{g(pk)}$ = peak r.f. grid voltage in volts

   and $V_{a(pk)}$ = peak r.f. anode voltage in volts
5. Oscillator output power = $P_{out} - P_{drive}$

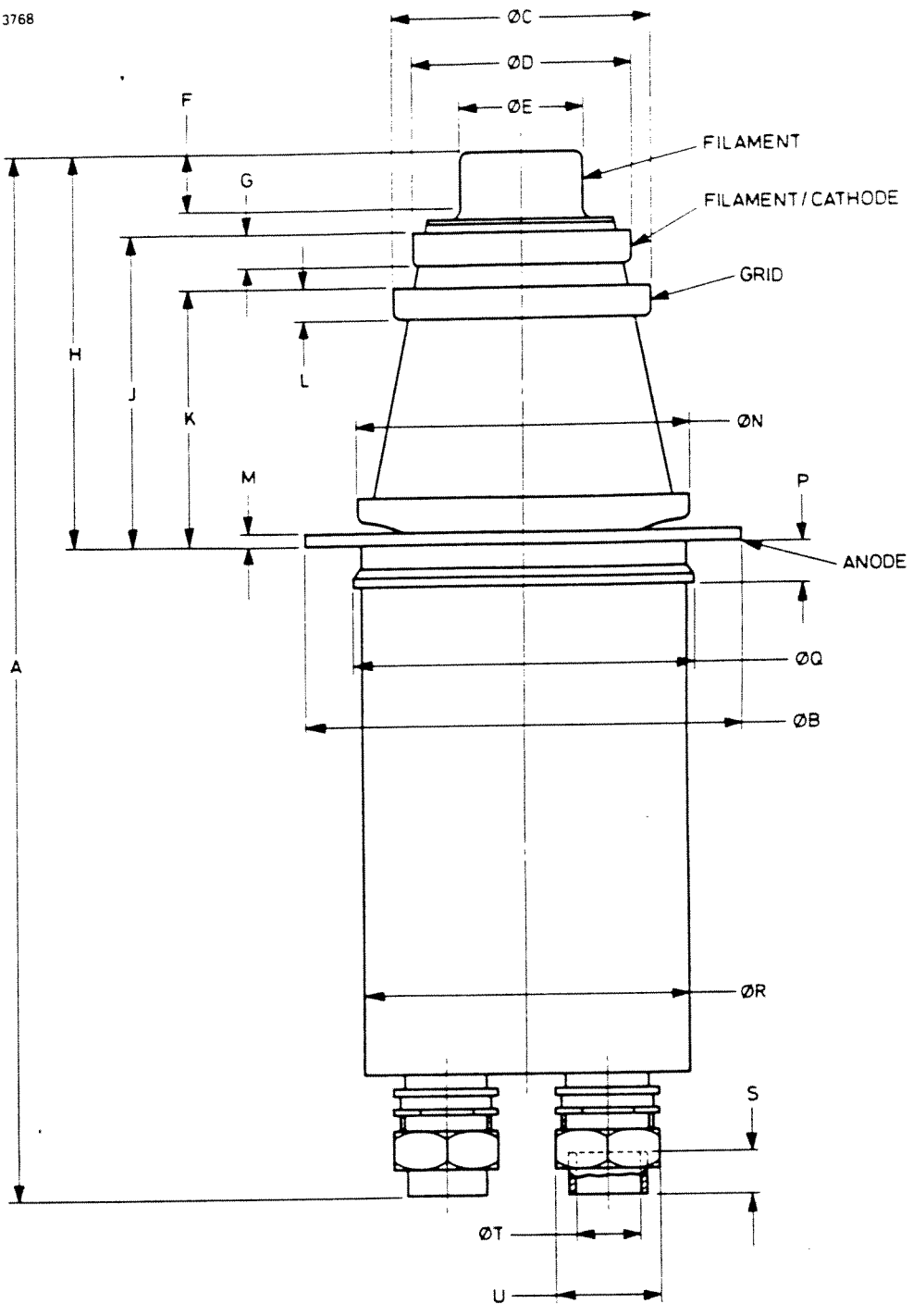
   where P_{out} = output power of tube to anode circuit

   and P_{drive} = drive power fed back to grid circuit.

TYPICAL CONSTANT CURRENT CHARACTERISTICS



OUTLINE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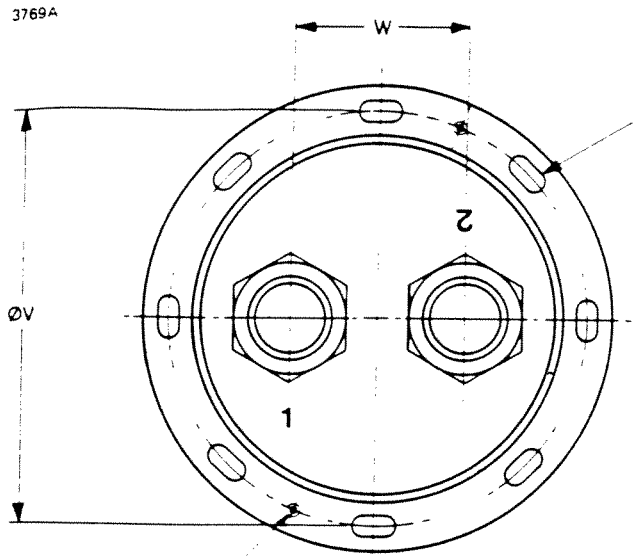

Water Connections

	Anode down	Anode up
Inlet	**1**	**2**
Outlet	**2**	**1**

Note Suitable water pipe connectors are supplied with BW1184J2.

Outline Dimensions (All dimensions without limits are nominal)

Ref	Millimetres	Inches	Ref	Millimetres	Inches
A	446.0 max	17.560 max	N	145.0 max	5.709 max
B	190.5 max	7.500 max	P	17.5	0.689
C	112.0 ± 0.2	4.409 ± 0.008	Q	138.0 max	5.433 max
D	96.0 ± 0.2	3.780 ± 0.008	R	133.0 ± 1.0	5.236 ± 0.039
E	54.0 ± 0.15	2.126 ± 0.006	S	18.5 min	0.728 min
F	25.0	0.984	T	28.0	1.102
G	15.0	0.591	U	46.0	1.811
H	171.5 max	6.752 max	V	170.0	6.693
J	137.0	5.394	W	70.0	2.756
K	113.0	4.449	X	9.0	0.354
L	14.0	0.551	Y	18.0	0.709
M	6.3	0.248			

Inch dimensions have been derived from millimetres.