BW1176J1
BW1176J2

R.F. POWER TRIODES

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

ABRIDGED DATA

Water cooled triodes with integral water jackets, intended primarily for industrial service and differing only in the location of the water jacket inlet and outlet connectors.

Anode dissipation	20	kW max
Anode voltage	10	kV max
Frequency for full ratings	20	MHz max
Output power (class C unmodulated)	70	kW

GENERAL

Electrical

Filament	thoriated tungsten	
Filament voltage (see note 1)	8.2	V
Filament current	230	A
Surge filament current (peak) (see note 2)	600	A max
Filament cold resistance	4.0	mΩ
Peak usable cathode current	60	A
Perveance	3.0	$mA/V^{3/2}$
Amplification factor (V_a = 6.0kV, I_a = 4.0A)	38	
Mutual conductance (V_a = 7.0kV, I_a = 4.0A)	60	mA/V
Inter-electrode capacitances:		
grid to anode	57	pF
grid to filament	105	pF
anode to filament	1.1	pF

Mechanical

Overall length	17.785 inches (451.7mm) max
Overall width	6.500 inches (165.1mm) nom
Net weight	14 pounds (6.4kg) approx
Mounting position	vertical, filament pins up

Accessories

Filament leads	MA131
Grid connector	MA66

COOLING

Anode

Types BW1176J1 and BW1176J2 have integral water jackets and differ only in the location of the water inlet and outlet connectors (see outline drawings).

Minimum water cooling requirements are shown on page 8; higher rates of flow should be used where possible.

Filament and Grid Seals

The temperature of the filament and grid seals must not exceed 140°C. A flow of air of 20 to 30ft^3/min (0.57 to 0.85m^3/min) directed into the filament header via a 1-inch (25mm) diameter nozzle before and during the application of any voltages is usually adequate for limiting the temperature of the seals.

Bulb

The bulb temperature must not exceed 180°C.

R.F. POWER AMPLIFIER AND OSCILLATOR
(Class C unmodulated conditions, one valve)

MAXIMUM RATINGS (Absolute values)

Anode voltage (see note 3)	10	kV max
Anode current	8.6	A max
Anode dissipation (see note 4)	20	kW max
Grid dissipation	1.0	kW max
Operating frequency (for full ratings)	20	MHz max

TYPICAL OPERATING CONDITIONS

Anode voltage	8.0	10	kV
Grid voltage	−420	−520	V
from grid resistor	380	475	Ω
Peak r.f. grid drive voltage	845	955	V
Anode current	8.5	8.6	A
Grid current (approx)	1.1	1.1	A
Anode dissipation	12.8	15	kW
Grid dissipation	470	480	W
Driving power	940	1050	W
Output power	54	70	kW
Efficiency	79	81	%
Load resistance	500	625	Ω

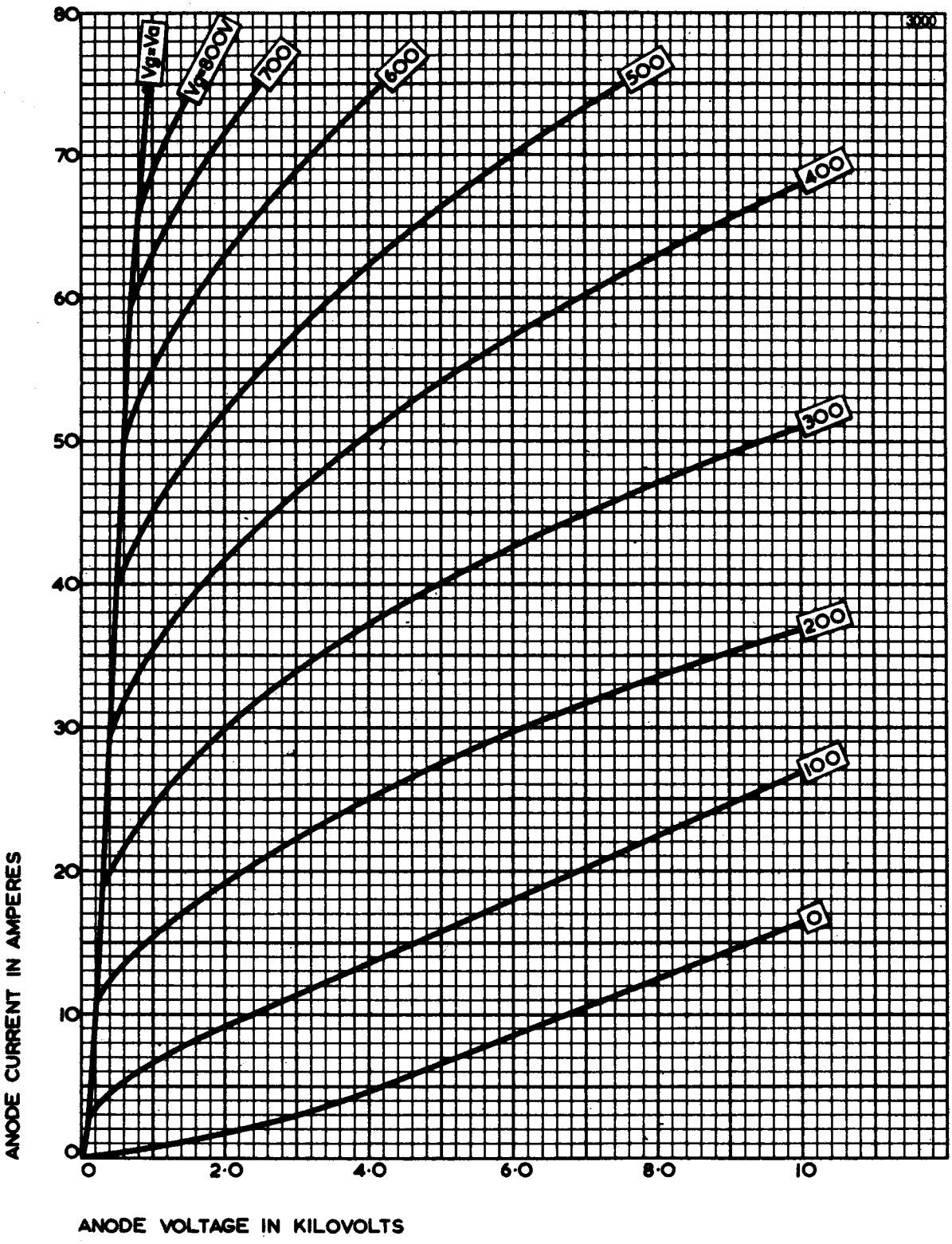
RANGE OF CHARACTERISTICS FOR EQUIPMENT DESIGN

	Min	Max	
Filament current at filament voltage 8.2V . .	207	253	A
Amplification factor (V_a = 6.0kV, I_a = 4.0A) .	32	44	
Mutual conductance (V_a = 7.0kV, I_a = 4.0A) .	54	66	mA/V
Anode current (V_a = 1.5kV, V_g = +600V) . .	53	65	A
Grid current (V_a = 1.5kV, V_g = +600V) . . .	8.0	12	A

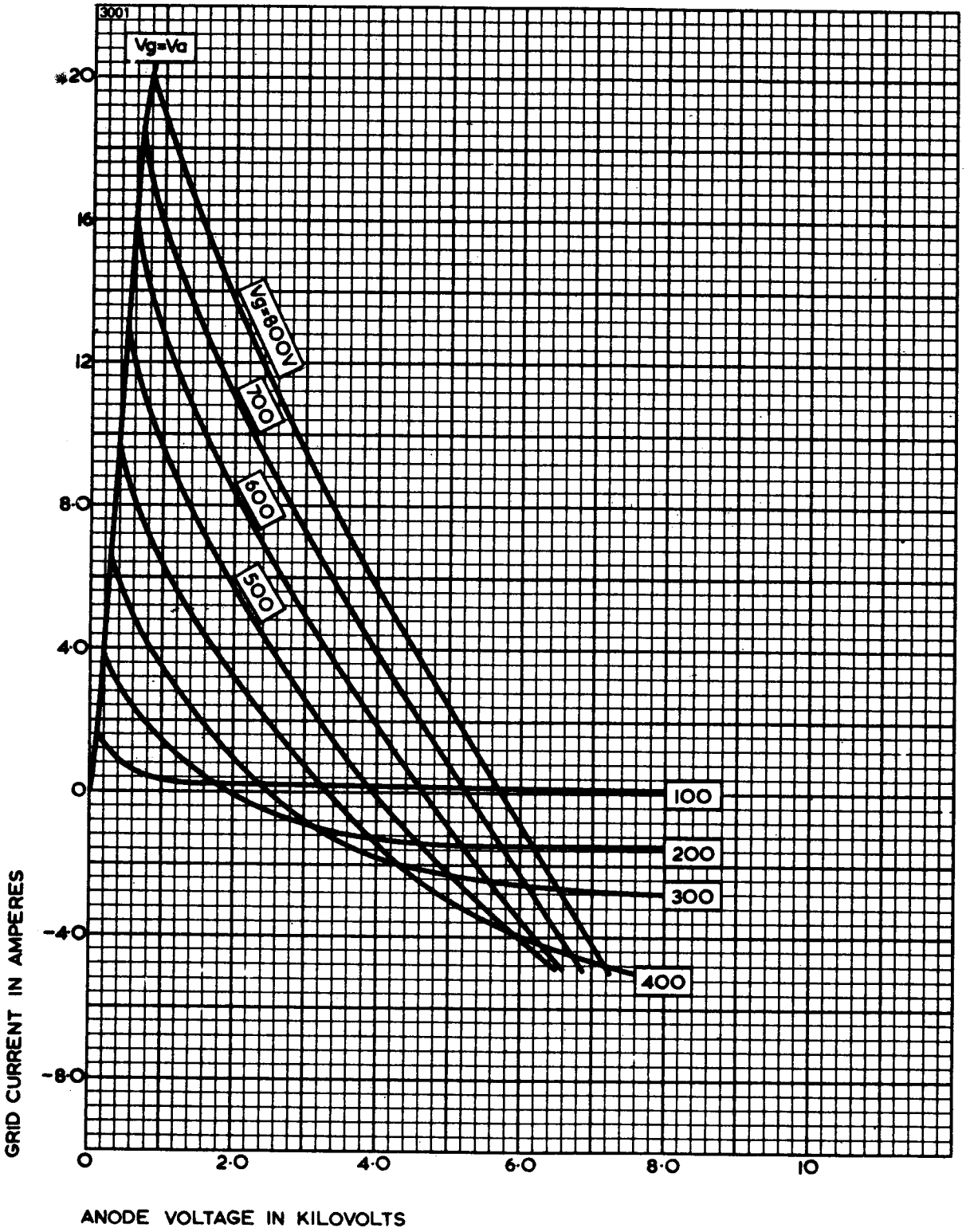
NOTES

1. The valve must be operated at the stated filament voltage. Fluctuation in filament voltage must not exceed $\pm$5%.
2. The filament current must not exceed 600A, even momentarily, at any time.
3. This is the highest nominal operating voltage to be used. It makes allowance for the normal mains voltage fluctuations as well as tolerances in the equipment.
4. The valve can dissipate higher powers for periods up to 15 seconds provided that the average over a long period does not exceed the maximum stated.

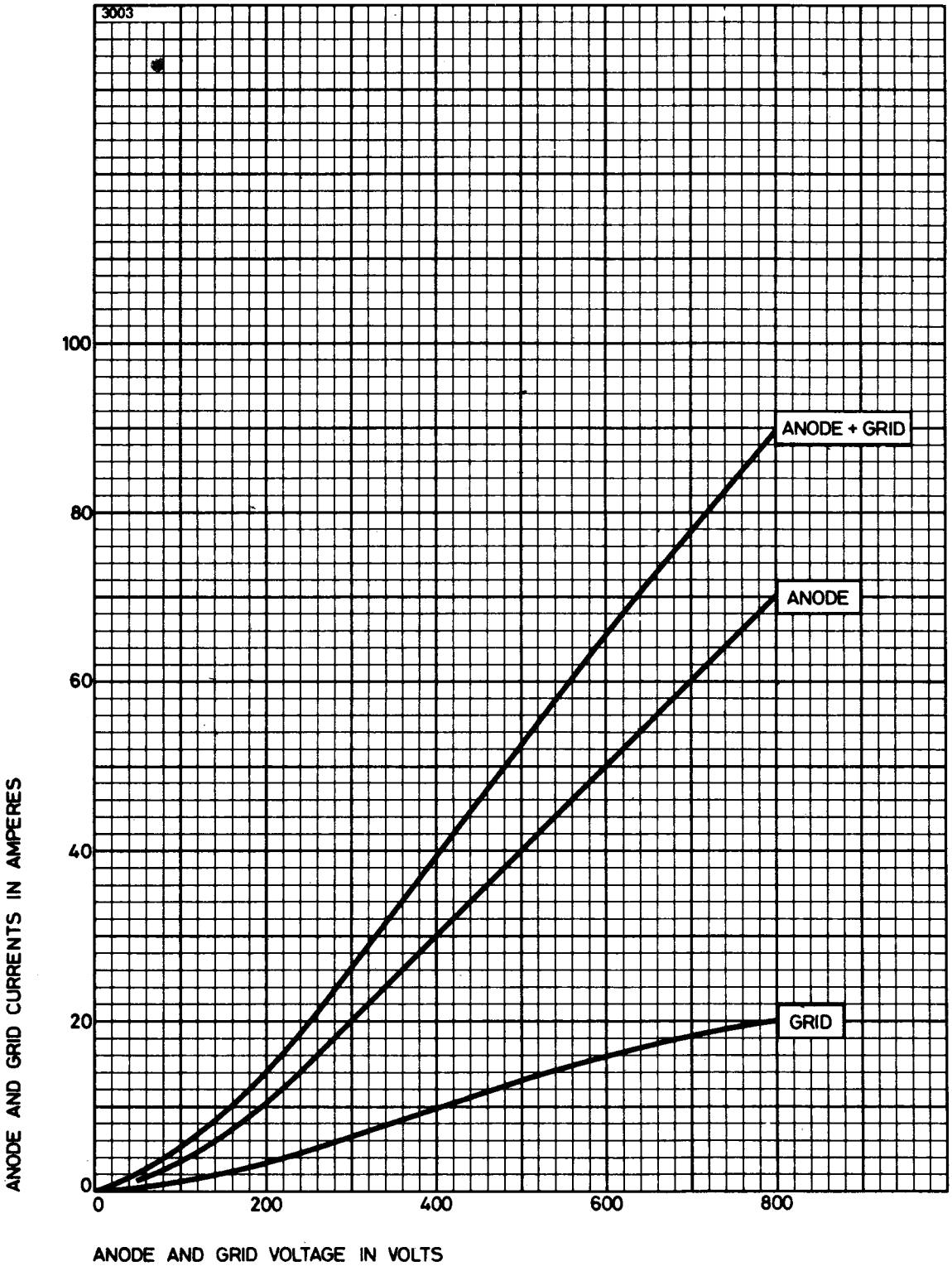
TYPICAL ANODE CHARACTERISTICS



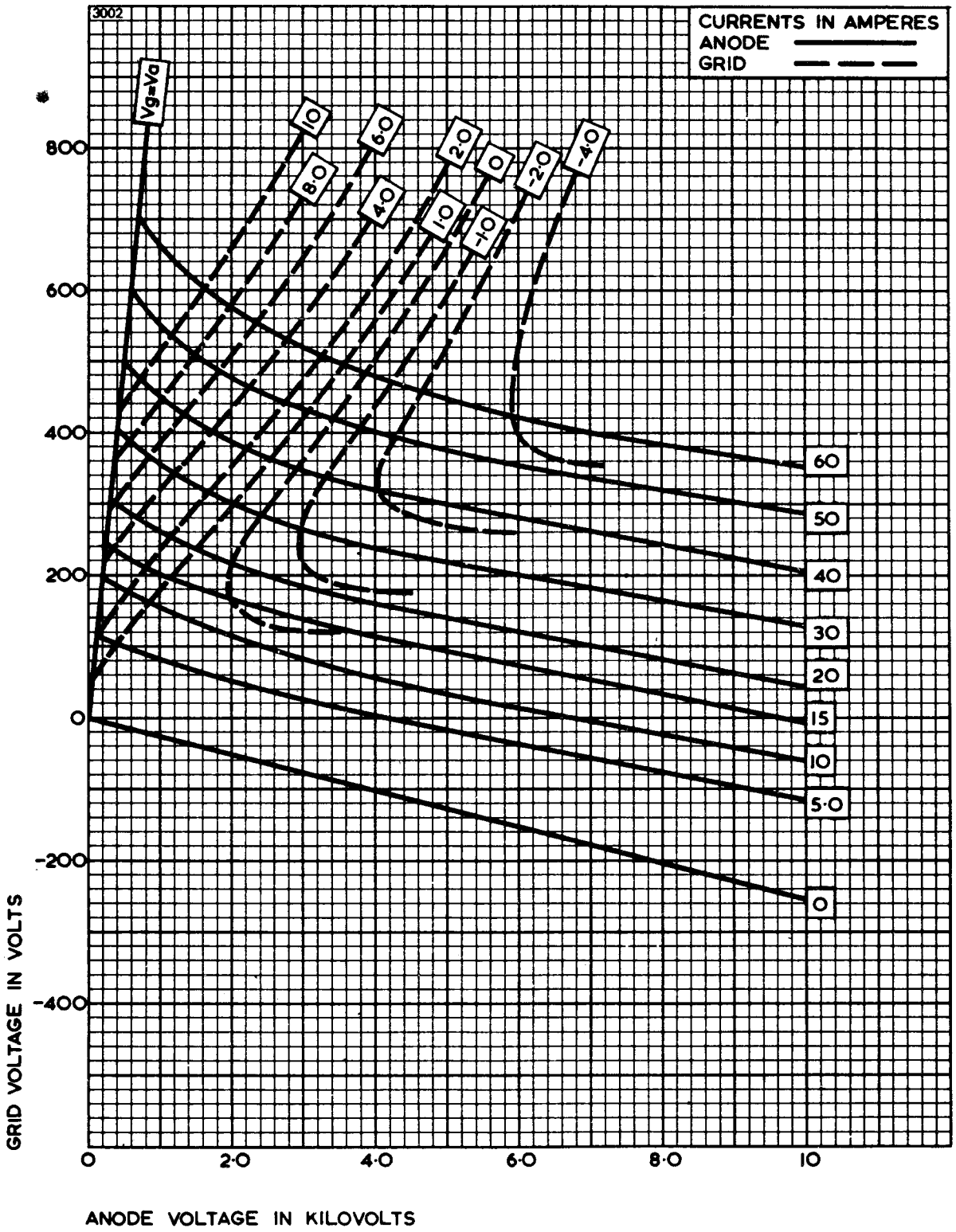
TYPICAL GRID CHARACTERISTICS



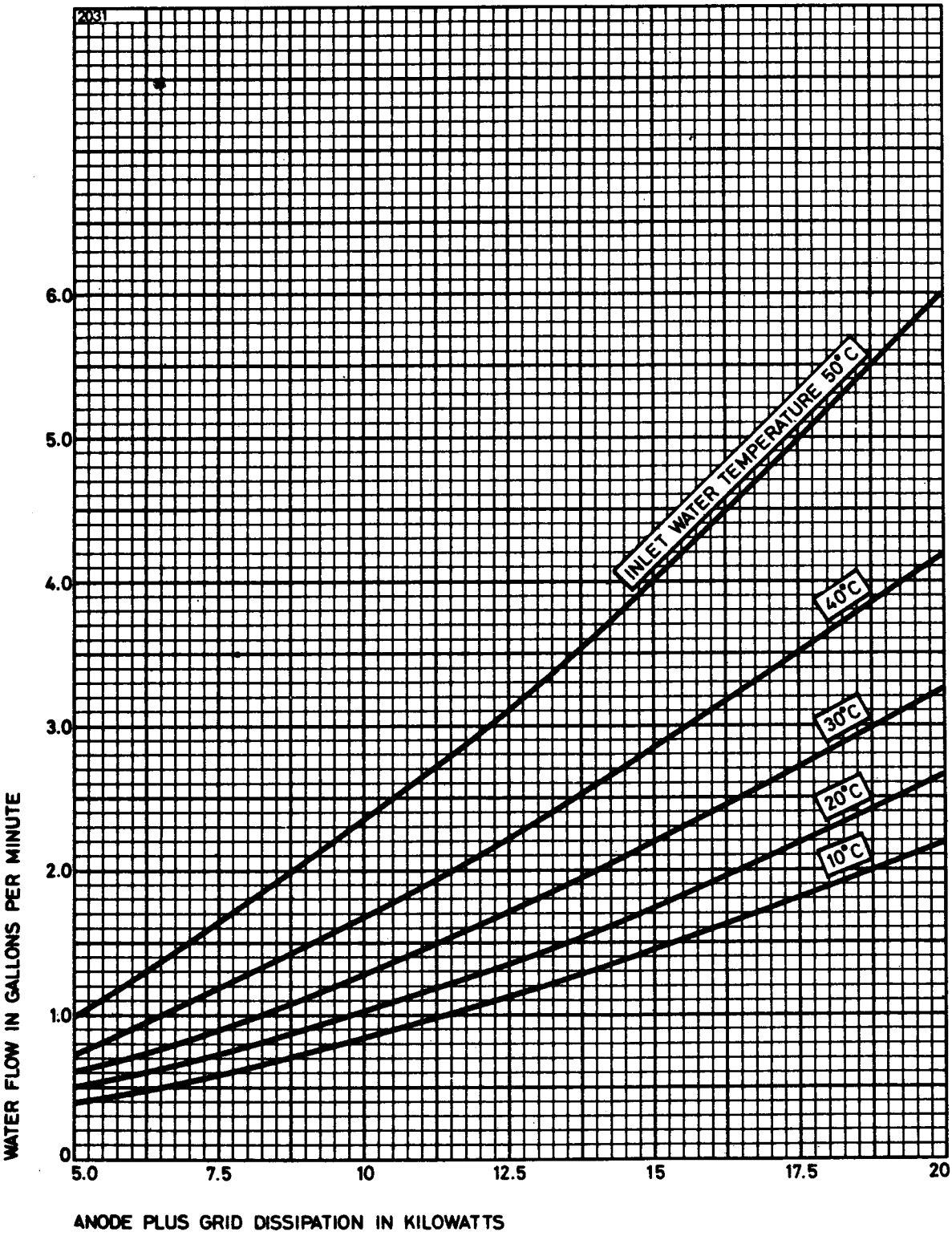
TYPICAL STRAPPED CHARACTERISTICS



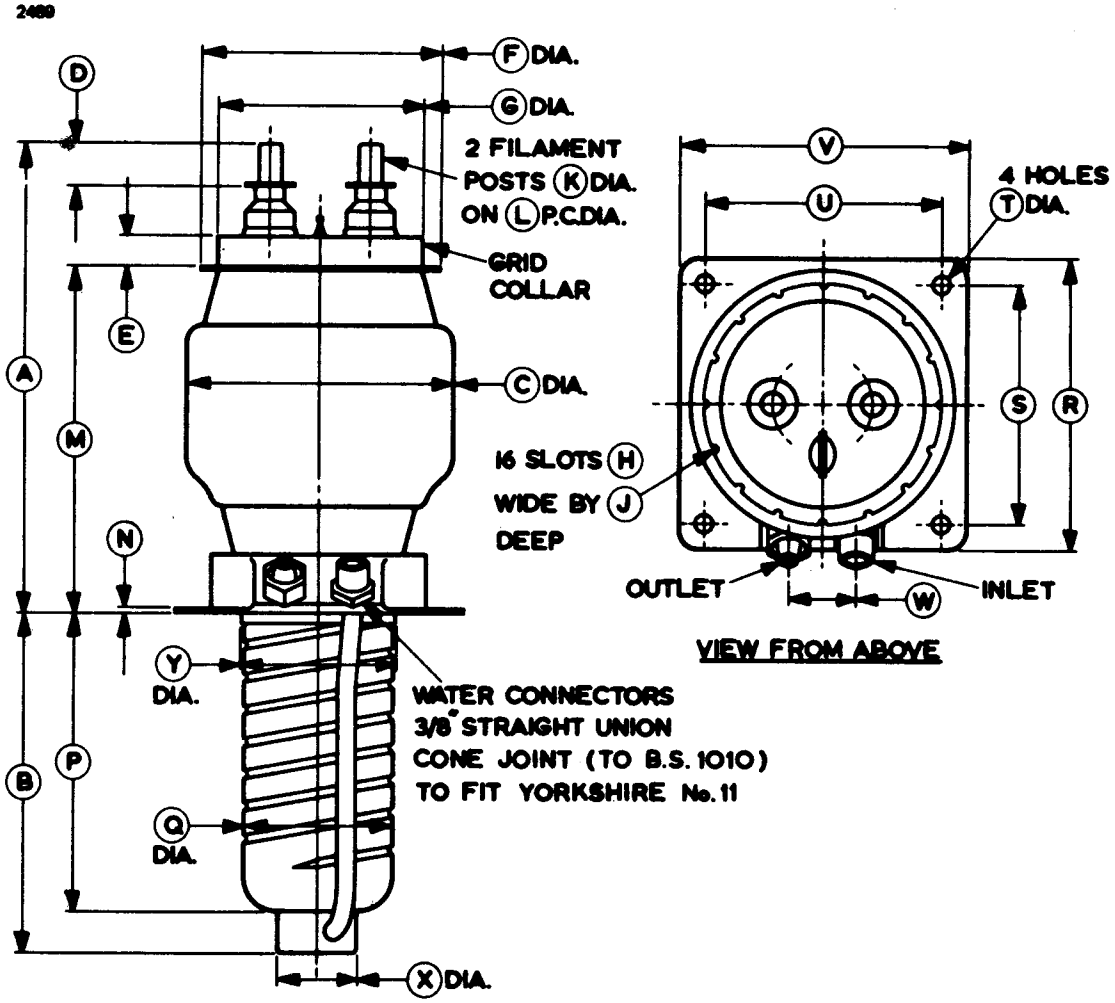
TYPICAL CONSTANT CURRENT CHARACTERISTICS



MINIMUM WATER COOLING REQUIREMENTS



OUTLINE FOR BW1176J1 (All dimensions without limits are nominal)

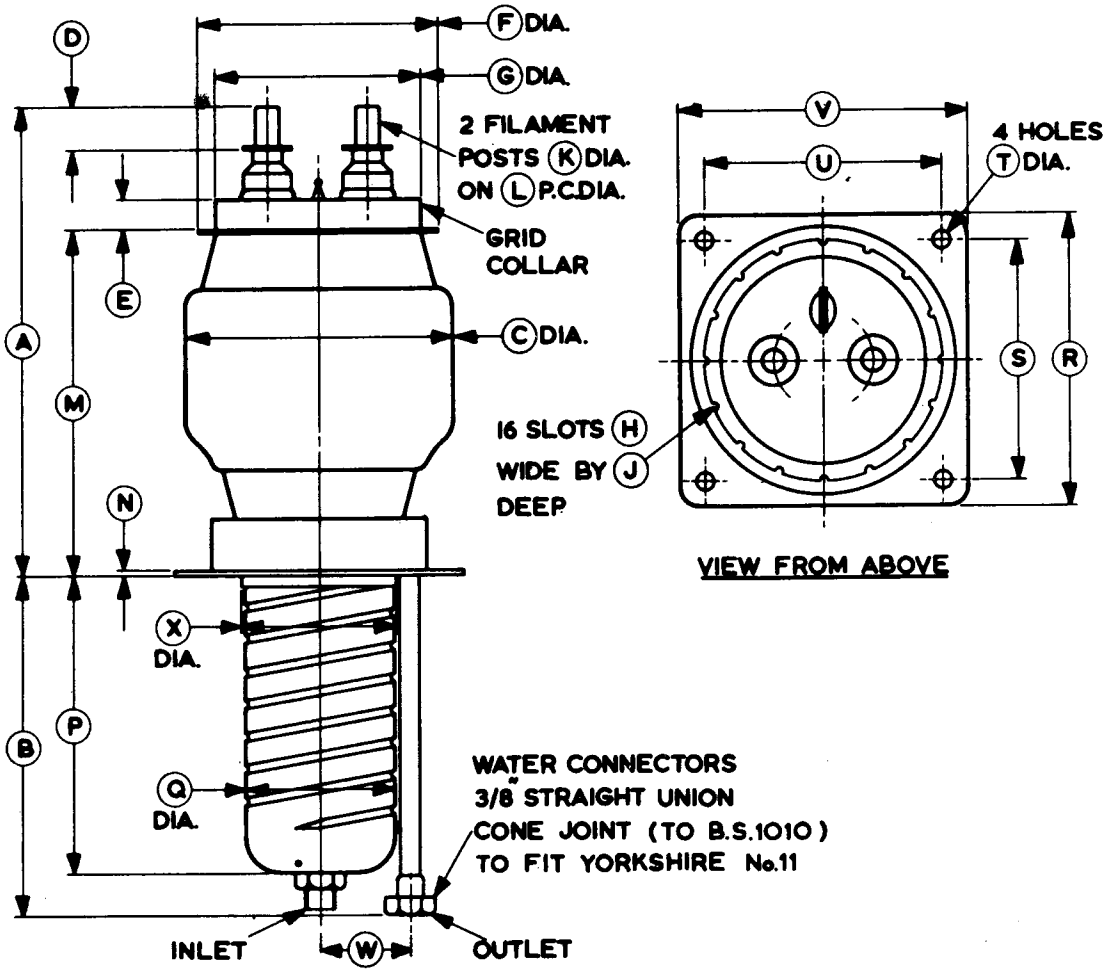


Ref	Inches	Millimetres	Ref	Inches	Millimetres
A	10.250 max	260.4 max	N	0.125	3.18
B	7.535 max	191.4 max	P	6.555	166.5
C	6.000 max	152.4 max	Q	3.562	90.47
D	1.000	25.40	R	6.500	165.1
E	0.734	18.64	S	5.000	127.0
F	5.630	143.0	T	0.375	9.53
G	4.703	119.5	U	5.000	127.0
H	0.153	3.89	V	6.500	165.1
J	0.205	5.21	W	1.250	31.75
K	0.625	15.88	X	2.000	50.80
L	2.250	57.15	Y	3.875	98.43
M	7.750 max	196.9 max			

Millimetre dimensions have been derived from inches.

OUTLINE FOR BW1176J2 (All dimensions without limits are nominal)

3004



Ref	Inches	Millimetres	Ref	Inches	Millimetres
A	10.250 max	260.4 max	M	7.750 max	196.9 max
B	7.535 max	191.4 max	N	0.125	3.18
C	6.000 max	152.4 max	P	6.555	166.5
D	1.000	25.40	Q	3.562	90.47
E	0.734	18.64	R	6.500	165.1
F	5.630	143.0	S	5.000	127.0
G	4.703	119.5	T	0.375	9.53
H	0.153	3.89	U	5.000	127.0
J	0.205	5.21	V	6.500	165.1
K	0.625	15.88	W	2.170	55.12
L	2.250	57.15	X	3.875	98.43

Millimetre dimensions have been derived from inches.