BR/BW/BY1122 Series

R.F. POWER TRIODES

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

ABRIDGED DATA

Three r.f. transmitting triodes differing only in the method of anode cooling. The tubes have grid terminals suitable for cathode drive operation.

Anode cooling:		
BR1122		forced-air
BW1122		water; separate jacket
BY1122		vapour; separate boiler unit
Anode dissipation	10	kW max
Anode voltage	12	kV max
Frequency for full ratings	5.0	MHz max
Frequency at reduced ratings	110	MHz max
Output power (class C telegraphy)	29	kW

GENERAL

Electrical

Filament	thoriated tungsten	
Filament voltage (see note 1)	6.0	V
Filament current	115	A
Surge filament current (peak) (see note 2)	260	A max
Filament cold resistance	6.0	mΩ
Peak usable cathode current	20	A
Perveance	1.4	$mA/V^{3/2}$
Amplification factor (V_a = 5.0kV, I_a = 1.0A)	37	
Mutual conductance (V_a = 5.0kV, I_a = 1.0A)	19	mA/V
Inter-electrode capacitances:		
grid to anode	31	pF
grid to filament	41	pF
.anode to filament	0.5	pF

Mechanical

Overall dimensions	see outline drawings
Net weights:	
BR1122	25 pounds (11.5kg) approx
BW1122	5 pounds (2.3kg) approx
BY1122	17 pounds (7.7kg) approx
Mounting position	vertical, filament end up

Accessories

Filament leads	MA135
Grid connector	MA66A
Water jacket for BW1122	BW4070
Sealing ring (supplied with BW1122)	MA252
Boiler unit, separate condenser required, for BY1122	BY4048A
Boiler unit, integral condenser, for BY1122	BY4064
Sealing ring (supplied with BY1122)	MA253

COOLING

Anode

The BR1122 air cooling requirements are shown on pages 9 and 10. The required air flow should be delivered through the radiator before and during the application of any voltages. Filament power, anode power and air flow may be removed simultaneously.

The anode of the BW1122 must be fitted into a water jacket for cooling, the recommended jacket being type BW4070. A flow of water of 2imp.gal/min (9.1 l./min) is required; the temperature of the cooling water at the outlet must not exceed 65°C, nor should the temperature rise across the jacket exceed 15°C.

The BY1122 is vapour cooled and may be operated either in boiler unit BY4048A or BY4064. In BY4064, the steam generated by the anode is condensed by means of an internal water cooled condenser. The steam produced in BY4048A is led away by suitably insulated tubing for condensation at some convenient point external to the boiler unit.

Filament and Grid Seals

The temperature of the filament and grid seals must not exceed 140°C. A flow of air of 15ft^3/min (0.43m^3/min) directed into the filament header via

a 1-inch (25mm approx) diameter nozzle before and during the application of any voltages is usually adequate for limiting the temperature of these seals.

Anode Seal and Bulb

The anode seal and bulb temperatures must not exceed 180°C.

R.F. POWER AMPLIFIER AND OSCILLATOR
(Class C Telegraphy, key-down conditions, one valve)

MAXIMUM RATINGS (Absolute values)

Anode voltage	12	kV max
Anode current	3.5	A max
Anode dissipation	10	kW max
Grid dissipation	500	W max
Operating frequency (for full ratings)	5.0	MHz max

TYPICAL OPERATING CONDITIONS

Anode voltage	6.0	8.5	10	12	kV
Grid voltage	−300	−450	−550	−650	V
Peak r.f. grid drive voltage	820	950	1060	1150	V
Anode current	3.4	3.1	3.2	3.0	A
Grid current (approx)	0.47	0.44	0.3	0.21	A
Anode dissipation	5.4	6.4	7.0	7.0	kW
Grid dissipation	245	220	155	105	W
Output power	15	20	25	29	kW
Efficiency	73.5	76	78	80	%

RANGE OF CHARACTERISTICS FOR EQUIPMENT DESIGN

	Min	Max	
Filament current at filament voltage 6.0V	107	121	A
Amplification factor (V_a = 5.0kV, I_a = 1.0A)	34	42	
Mutual conductance (V_a = 5.0kV, I_a = 1.0A)	15	23	mA/V
Grid voltage (negative value) (V_a = 5.0kV, I_a = 1.0A)	41	71	V
Grid voltage (negative value) (V_a = 10kV, I_a = 0.1A)	—	380	V
Anode current (V_a = 2.0kV, V_g = +200V)	5.1	6.9	A

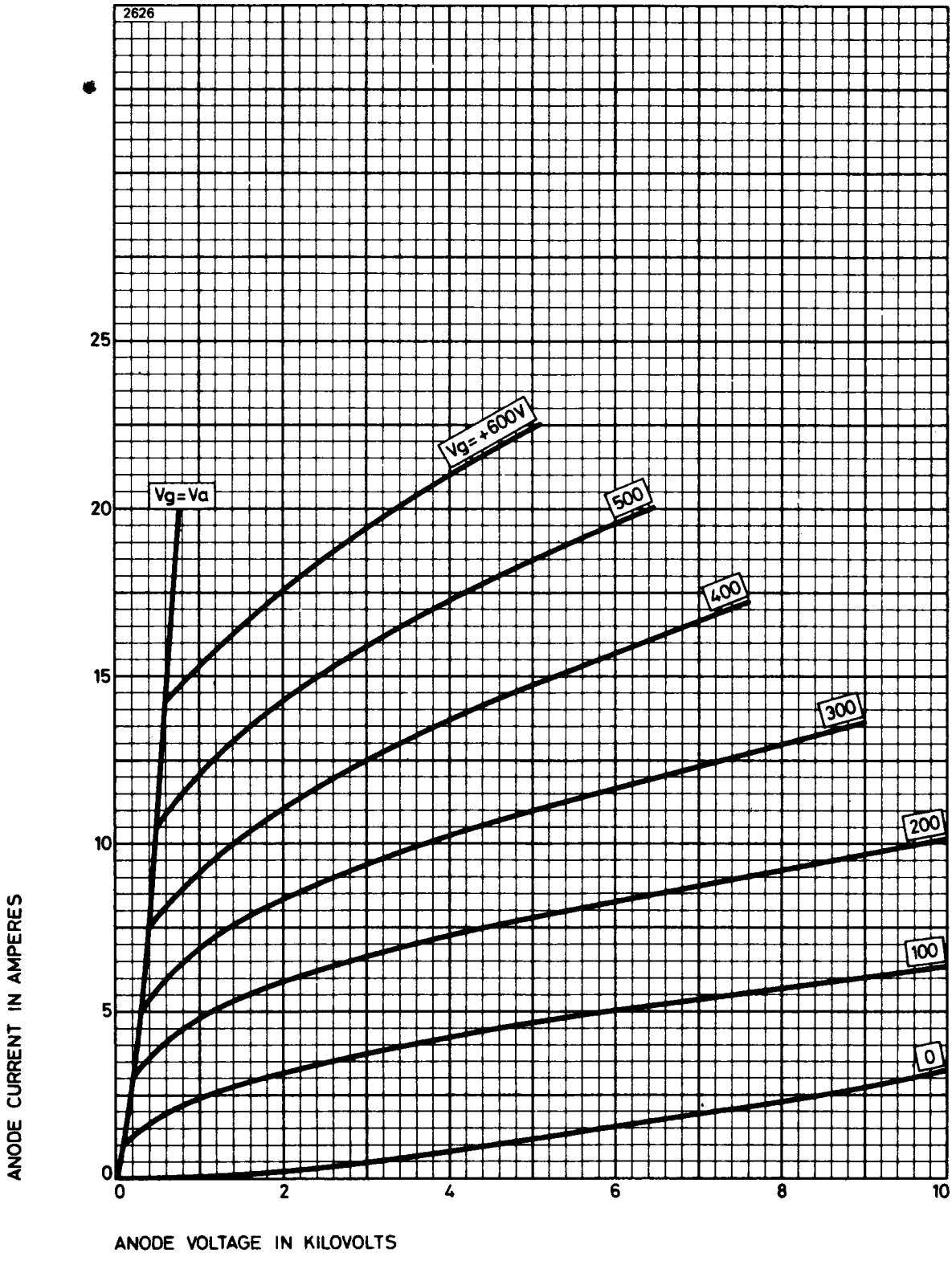
MAXIMUM ANODE VOLTAGE AGAINST FREQUENCY

Operating frequency (MHz)	Max anode voltage c.w. (kV)	Max anode voltage with anode modulation (kV)
5	12	10
20	10	8
50	8.5	6.7
110	6.5	5.3

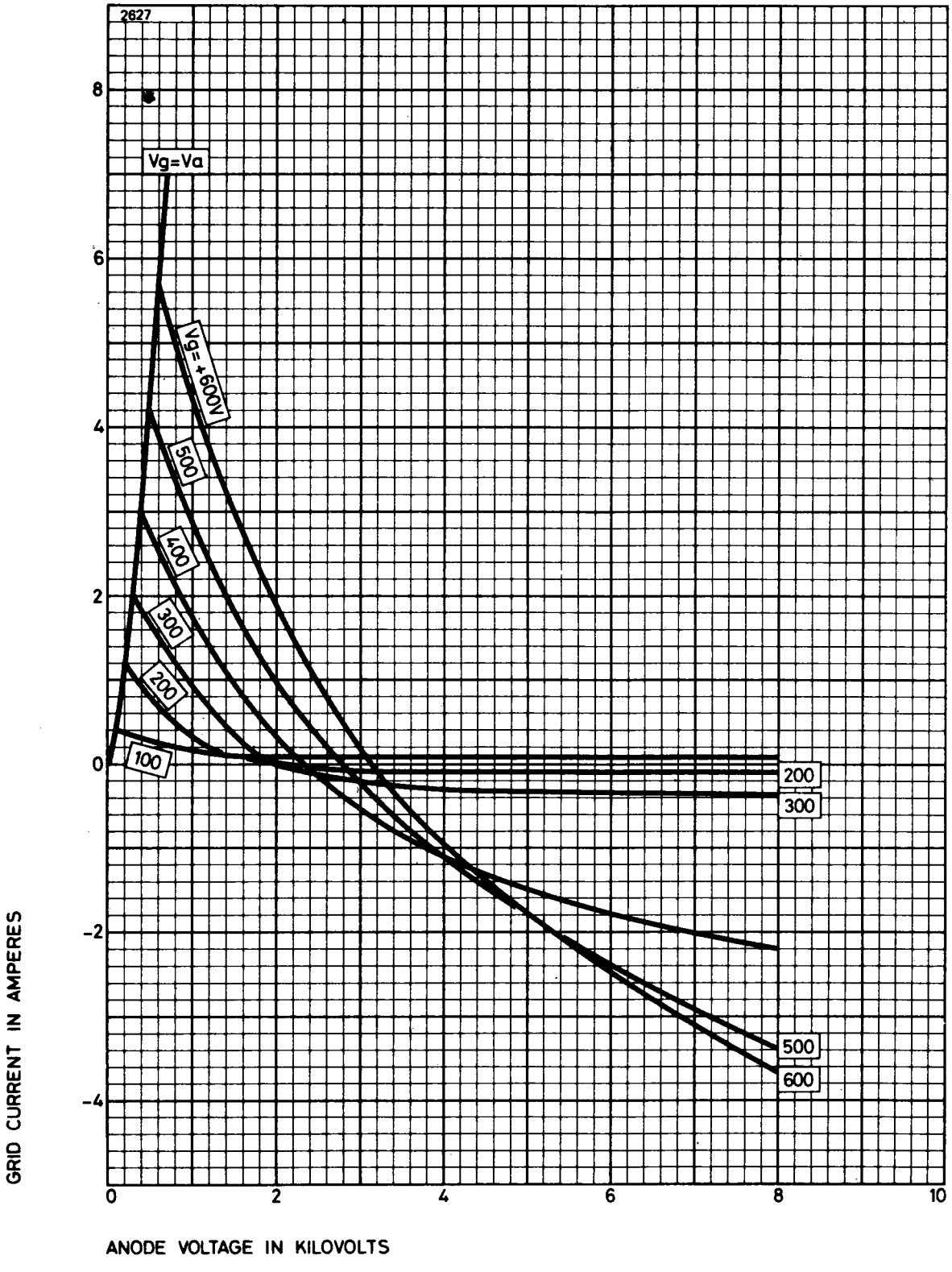
NOTES

1. The valve must be operated at the stated filament voltage. Fluctuation in filament voltage must not exceed 5%.
2. The filament current must not exceed 260A, even momentarily, at any time.

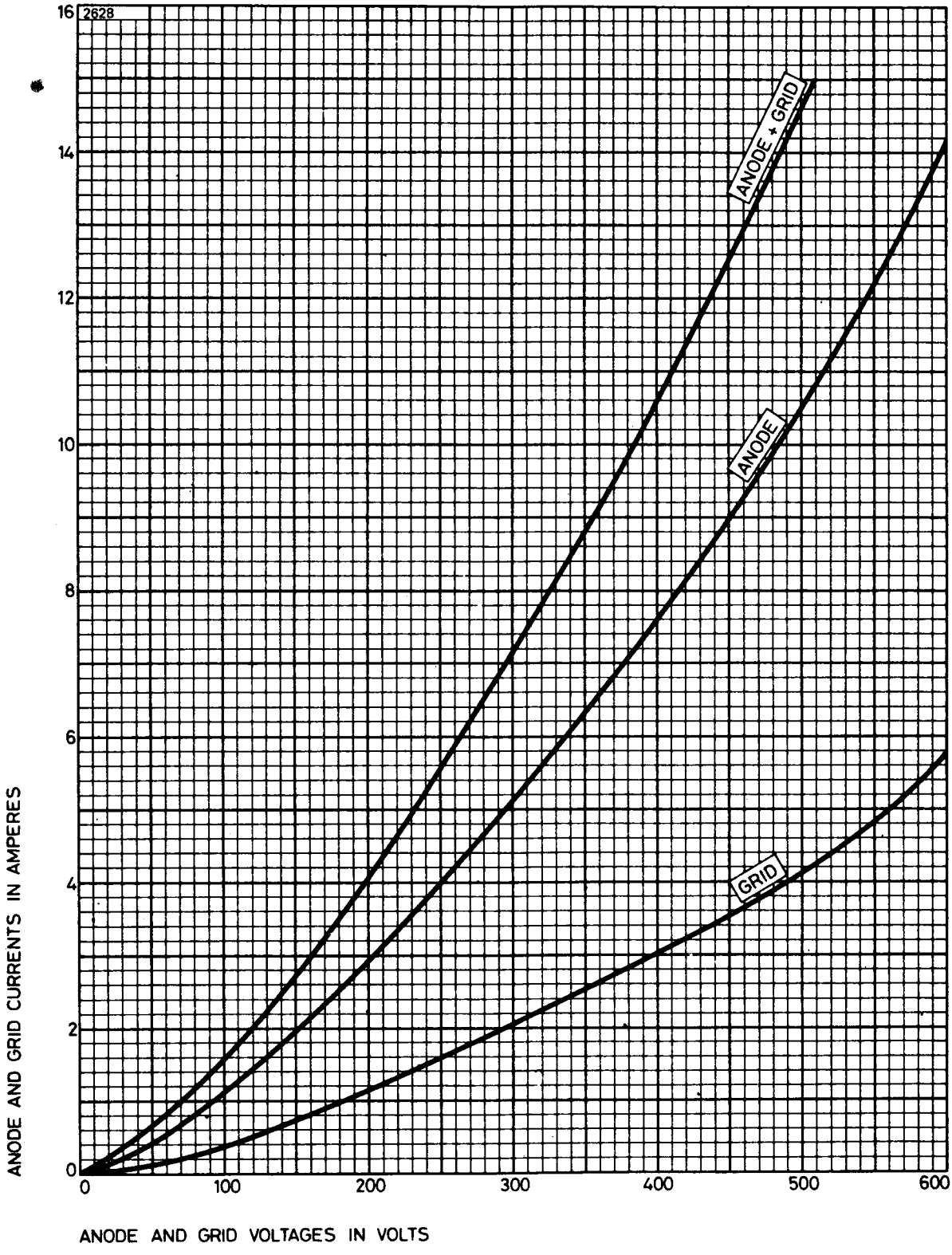
TYPICAL ANODE CHARACTERISTICS



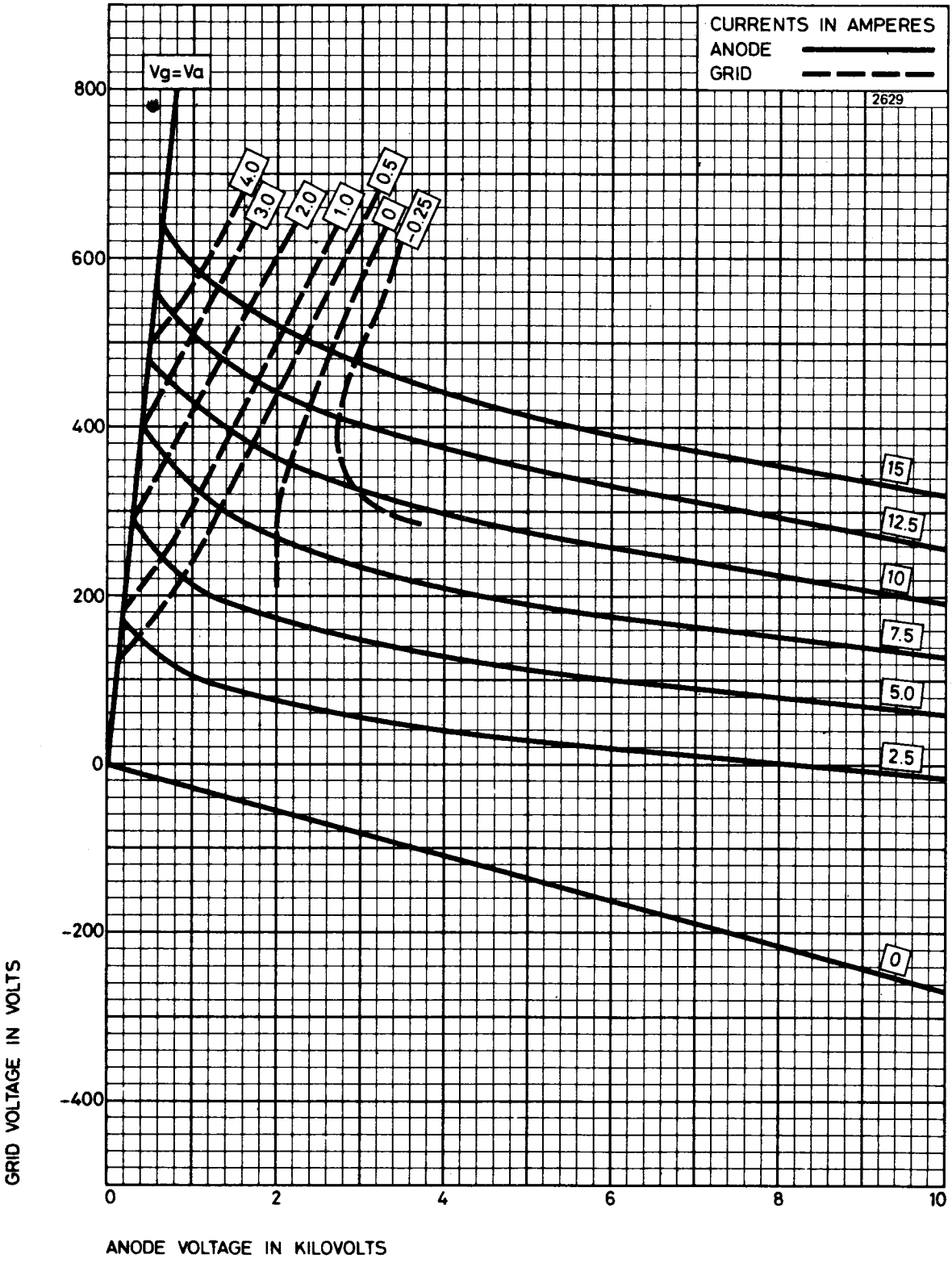
TYPICAL GRID CHARACTERISTICS



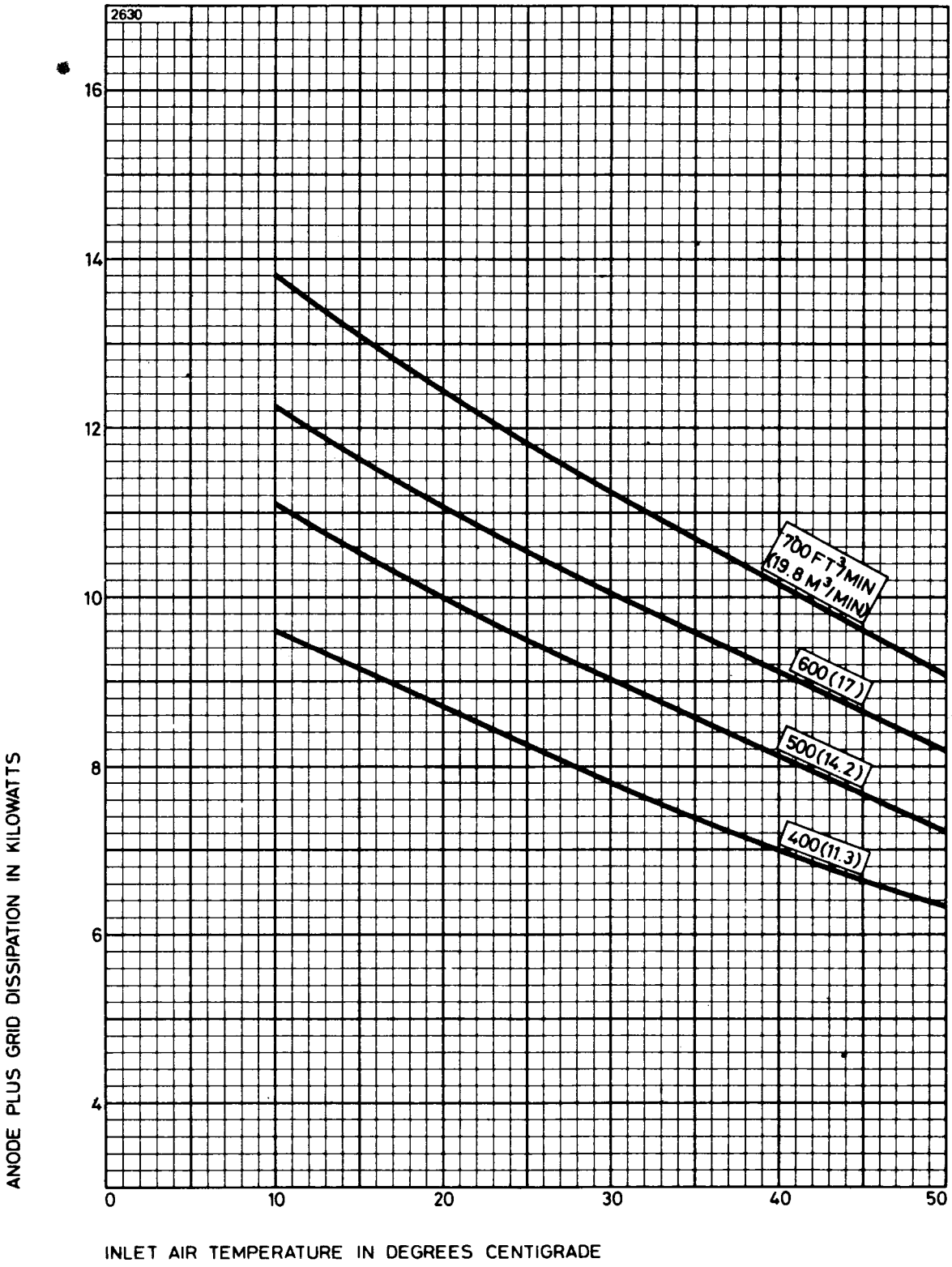
TYPICAL STRAPPED CHARACTERISTICS



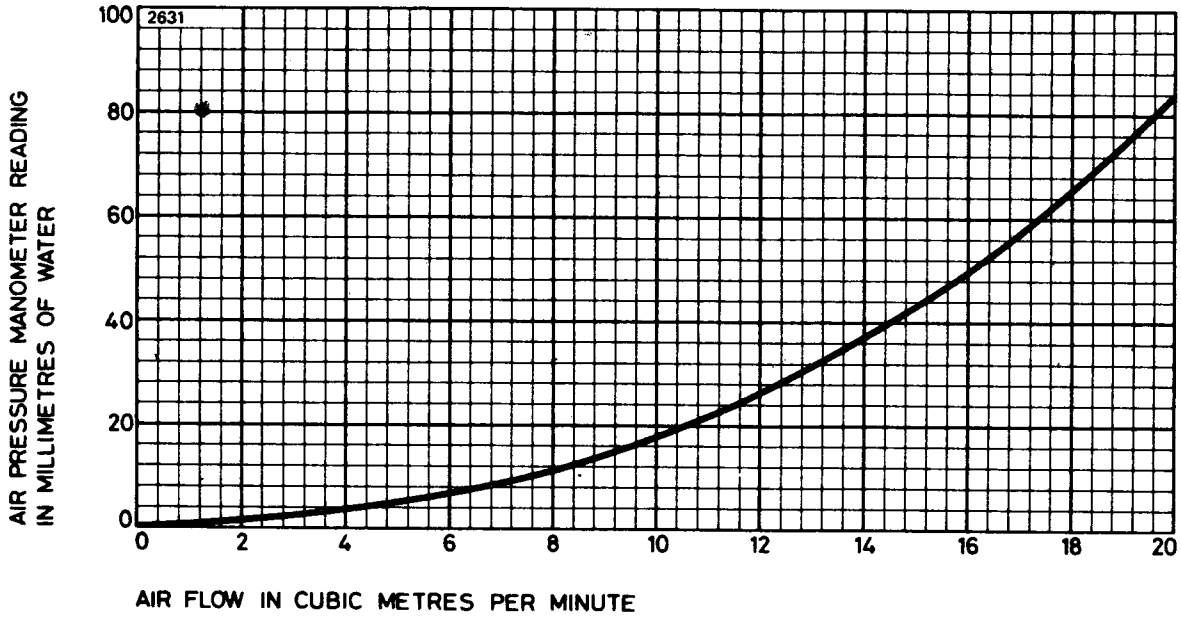
TYPICAL CONSTANT CURRENT CHARACTERISTICS

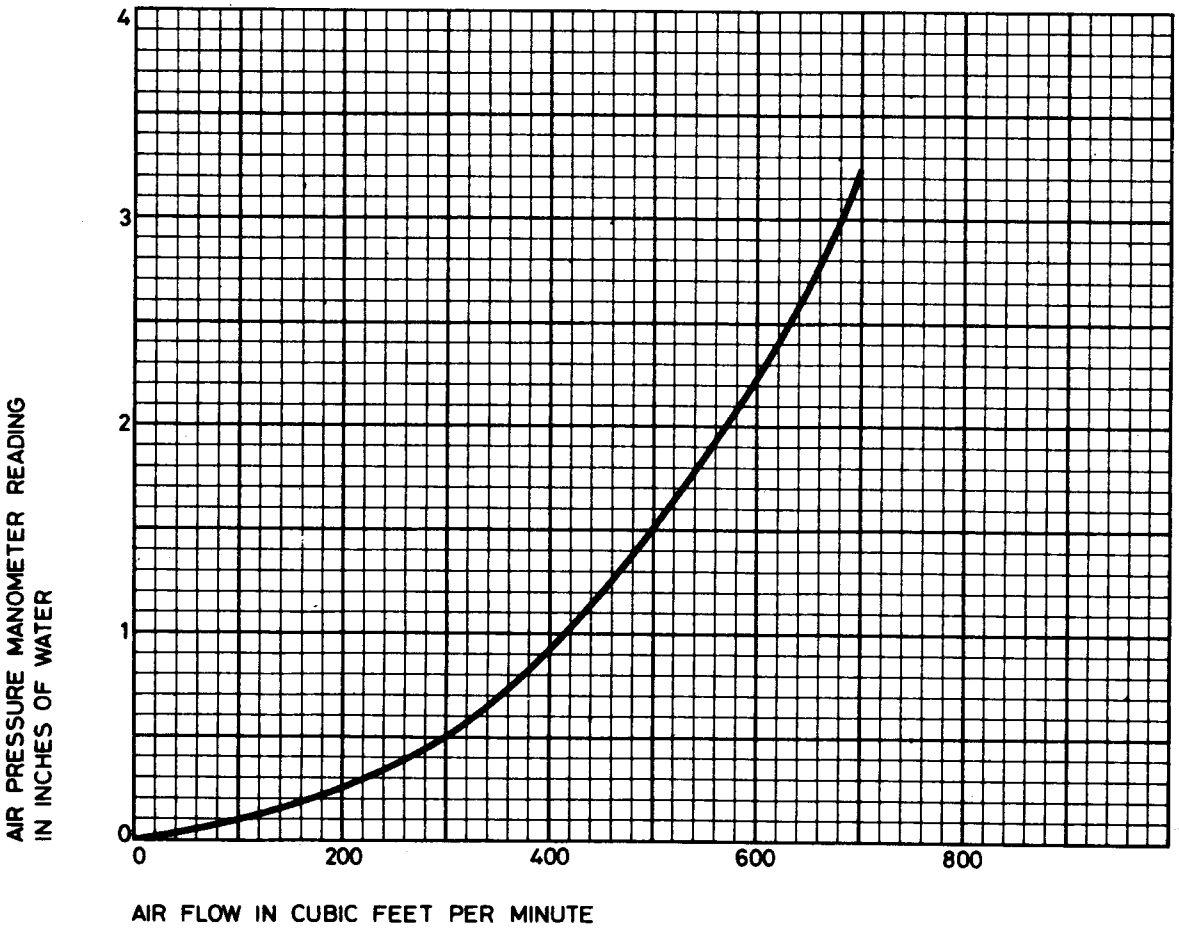


AIR COOLING REQUIREMENTS FOR BR1122

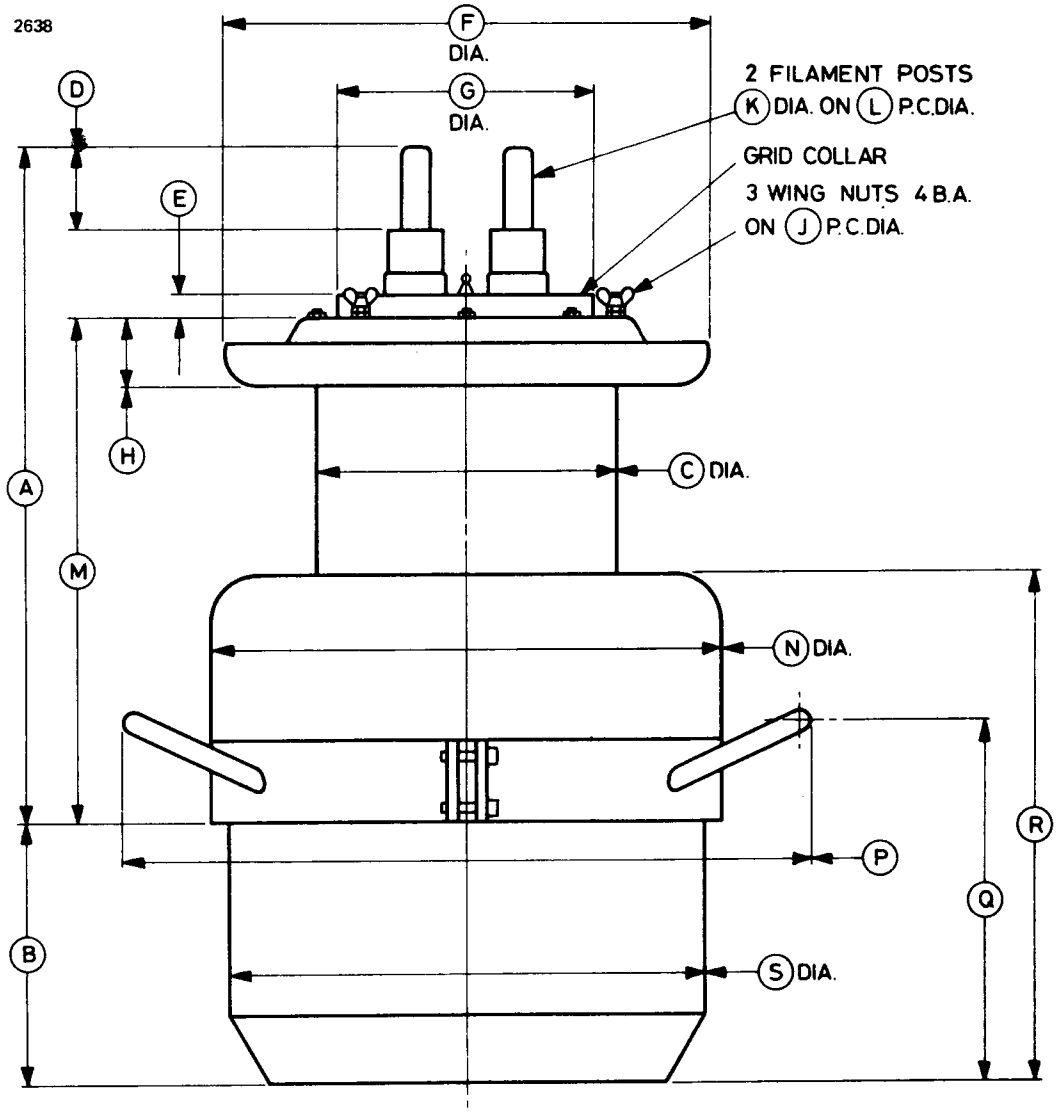


AIR FLOW CHARACTERISTIC FOR BR1122





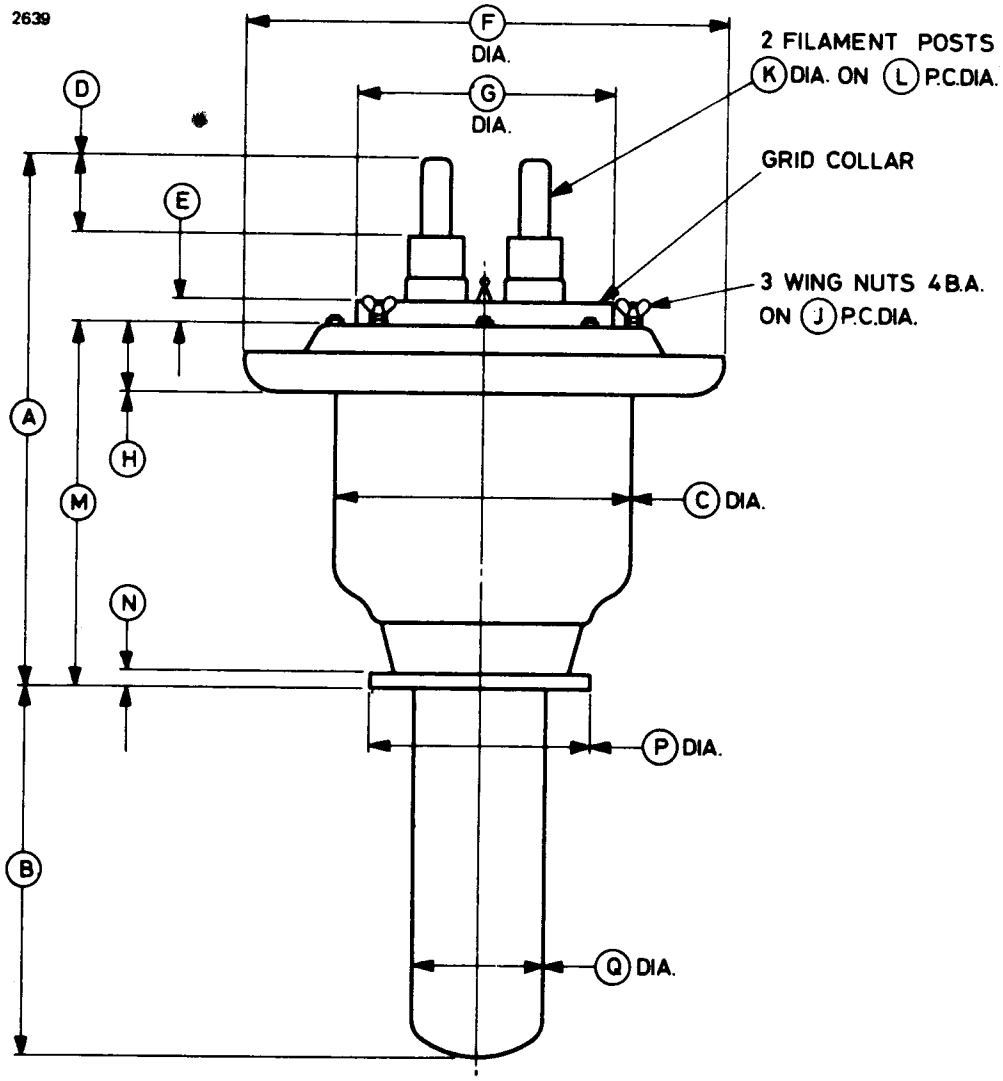
OUTLINE FOR BR1122 (All dimensions without limits are nominal)



Ref	Inches	Millimetres	Ref	Inches	Millimetres
A	10.062 max	255.6 max	K	0.437	11.10
B	3.812	96.82	L	1.500	38.10
C	4.500	114.3	M	7.813 max	198.5 max
D	1.125	28.58	N	7.625 max	193.7 max
E	0.328	8.33	P	10.125	257.2
F	7.125	181.0	Q	5.250	133.4
G	3.750	95.25	R	7.425	188.6
H	1.000	25.40	S	7.062 max	179.4 max
J	4.375	111.1			

Millimetre dimensions have been derived from inches.

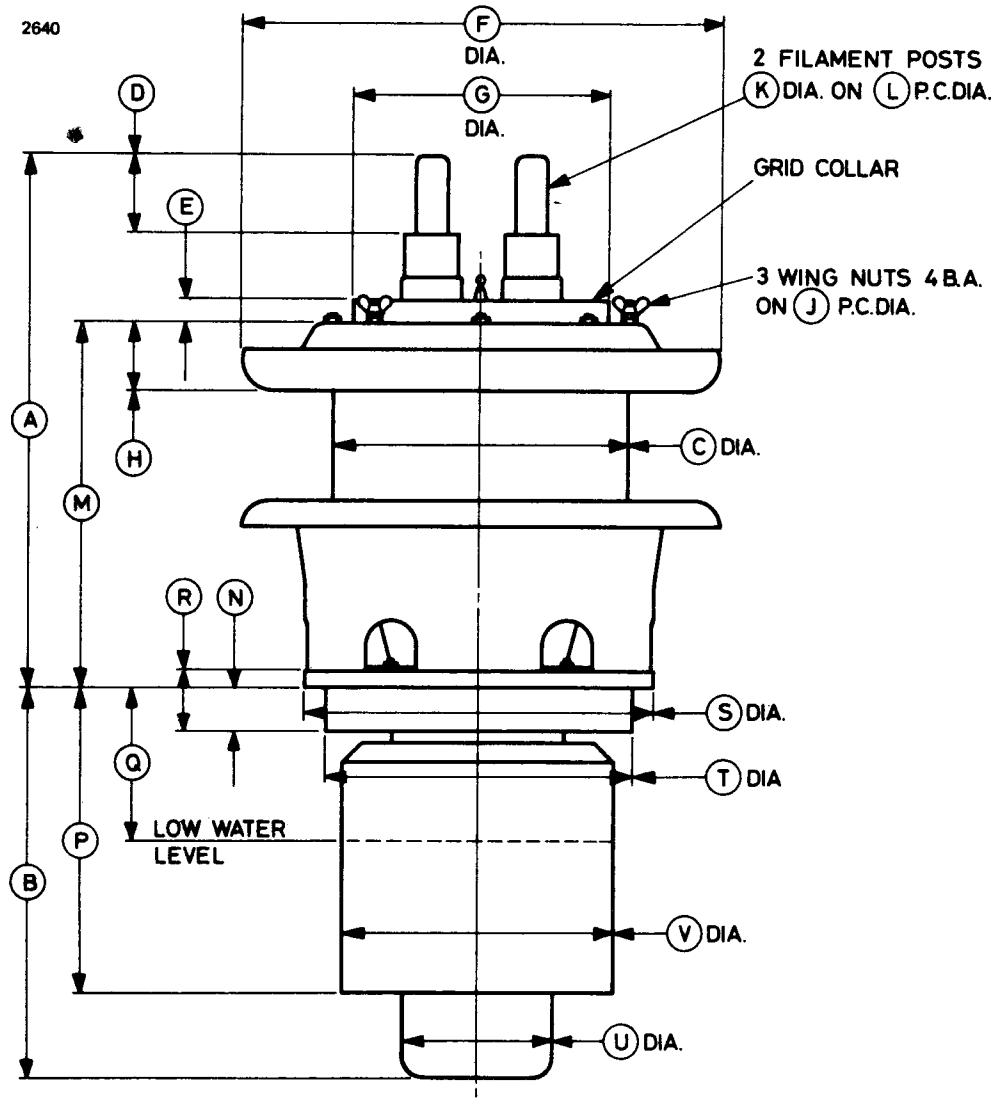
OUTLINE FOR BW1122 (All dimensions without limits are nominal)



Ref	Inches	Millimetres	Ref	Inches	Millimetres
A	8.125 max	206.4 max	J	4.375	111.1
B	5.375	136.5	K	0.437	11.10
C	4.500	114.3	L	1.500	38.10
D	1.125	28.58	M	5.625 max	142.9 max
E	0.328	8.33	N	0.250	6.35
F	7.125	181.0	P	3.250	82.55
G	3.750	95.25	Q	2.000	50.80
H	1.000	25.40			

Millimetre dimensions have been derived from inches.

OUTLINE FOR BY1122 (All dimensions without limits are nominal)



Ref	Inches	Millimetres	Ref	Inches	Millimetres
A	8.000 max	203.2 max	L	1.500	38.10
B	5.687 ± 0.062	144.4 ± 1.6	M	5.500 max	139.7 max
C	4.500	115.0	N	0.625	15.88
D	1.125	28.58	P	4.438	112.7
E	0.328	8.33	Q	2.250	57.15
F	7.125	181.0	R	0.875	22.23
G	3.750	95.25	S	5.125 ± 0.020	130.2 ± 0.5
H	1.000	25.40	T	4.500 ± 0.020	114.3 ± 0.5
J	4.375	111.1	U	2.250	57.15
K	0.437	11.10	V	4.000	101.6

Millimetre dimensions have been derived from inches.