

BR1183 BW1183J1

R.F. POWER TRIODES

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

ABRIDGED DATA

Two r.f. power triodes with ceramic/metal envelopes, intended primarily for industrial service. They differ only in the method of anode cooling.

Anode cooling:

BR1183	forced-air
BW1183J1	water; integral jacket
Anode dissipation	20 kW max
Anode voltage	10 kV max
Frequency for full ratings	50 MHz max
Output power (class C unmodulated conditions)	70 kW

GENERAL

Electrical

Filament	thoriated tungsten
Filament voltage (see note 1)	8.2 V
Filament current	230 A
Filament starting 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 ($V_a = 6.0\text{kV}$, $I_a = 4.0\text{A}$)	38
Mutual conductance ($V_a = 7.0\text{kV}$, $I_a = 4.0\text{A}$)	60 mA/V
Inter-electrode capacitances:	
grid to anode	57 pF
grid to filament	100 pF
anode to filament	1.7 pF

Mechanical

Overall dimensions	see outline drawings
Net weights:	
BR1183	18kg (40 pounds) approx
BW1183J1	5.5kg (12 pounds) approx
Mounting position	vertical, either end up

COOLING

Anode

The BR1183 air cooling requirements are shown on pages 7 and 8. The required air flow should be delivered by a blower through the radiator before and during the application of any voltages. Filament power, anode power and air may be removed simultaneously.

Type BW1183J1 has an integral water jacket (see outline drawing). Minimum water cooling requirements are shown on page 9; 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 30ft³/min (0.57 to 0.85m³/min) directed onto the filament terminals via a 1-inch (25mm approx) diameter nozzle before and during the application of any voltages is usually adequate for limiting the temperatures of the seals.

Anode Seal and Envelope

The anode seal and envelope temperatures 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	9.0	A max
Anode dissipation (see note 4)	20	kW max
Grid dissipation	1.0	kW max
Operating frequency (for full ratings)	50	MHz max

TYPICAL OPERATING CONDITIONS

Anode voltage	8.0	10	kV
Grid voltage	-420	-520	V
from grid resistor	250	330	Ω
Peak r.f. grid drive voltage	860	980	V
Anode current	8.7	8.75	A
Grid current (approx)	1.6	1.6	A
Anode dissipation	14.3	16.2	kW
Grid dissipation	720	730	W
Driving power	1400	1560	W
Output power	54	70	kW
Efficiency	78	80	%
Load resistance	475	600	Ω

RANGE OF CHARACTERISTICS FOR EQUIPMENT DESIGN

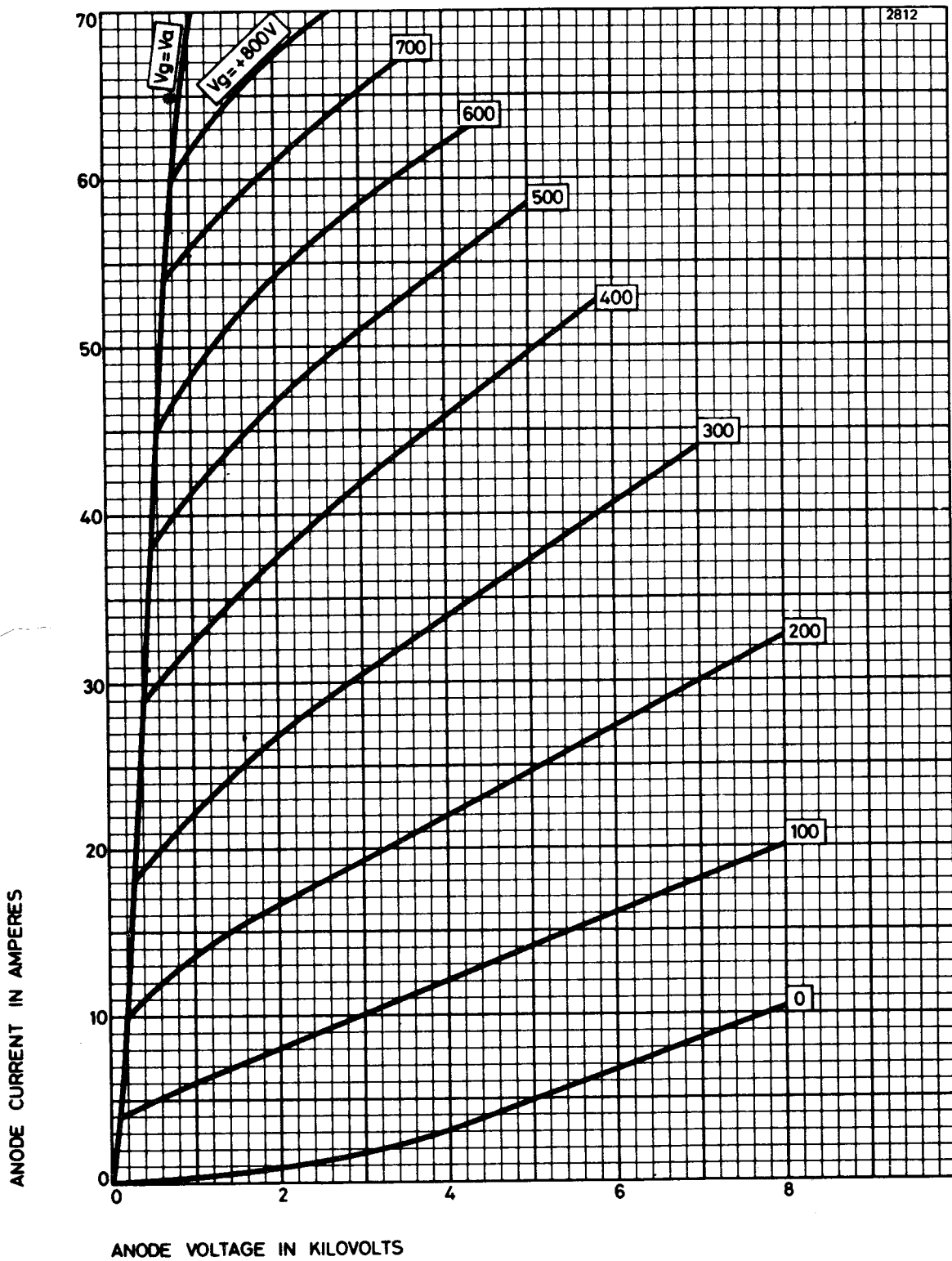
	Min	Max	
Filament current at filament voltage 8.2V .	207	253	A
Amplification factor ($V_a = 6.0\text{kV}$, $I_a = 4.0\text{A}$) .	32	44	
Mutual conductance ($V_a = 7.0\text{kV}$, $I_a = 4.0\text{A}$) .	56	68	mA/V
Anode current ($V_a = 1.5\text{kV}$, $V_g = +600\text{V}$) . .	47	57	A
Grid current ($V_a = 1.5\text{kV}$, $V_g = +600\text{V}$) . . .	11	15	A

NOTES

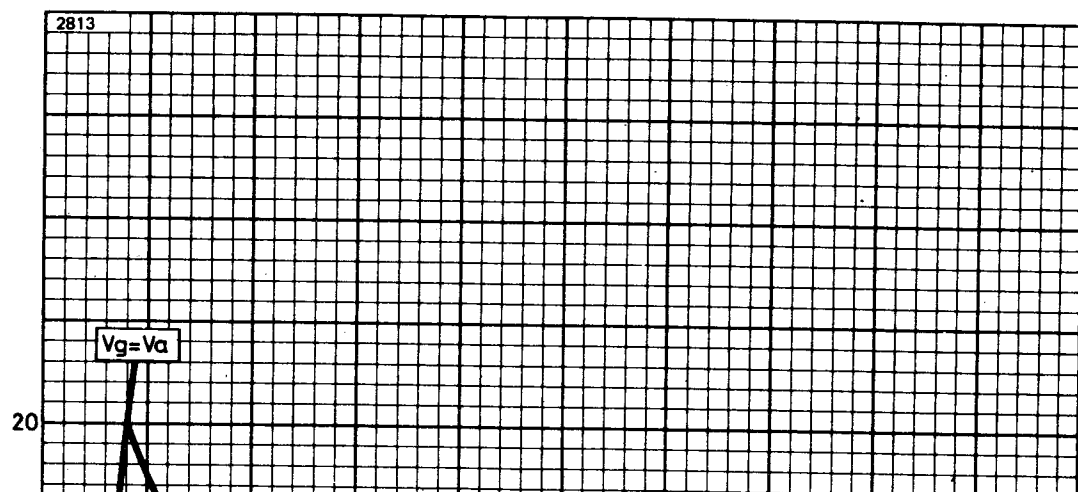
1. The valve must be operated at the stated filament voltage. Fluctuation in filament voltage must not exceed $\pm 5\%$.
2. The filament current must not exceed 600A, even momentarily, at any time.
3. This is the highest nominal operating voltage to be used. It makes allowance for the normal mains voltage 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.



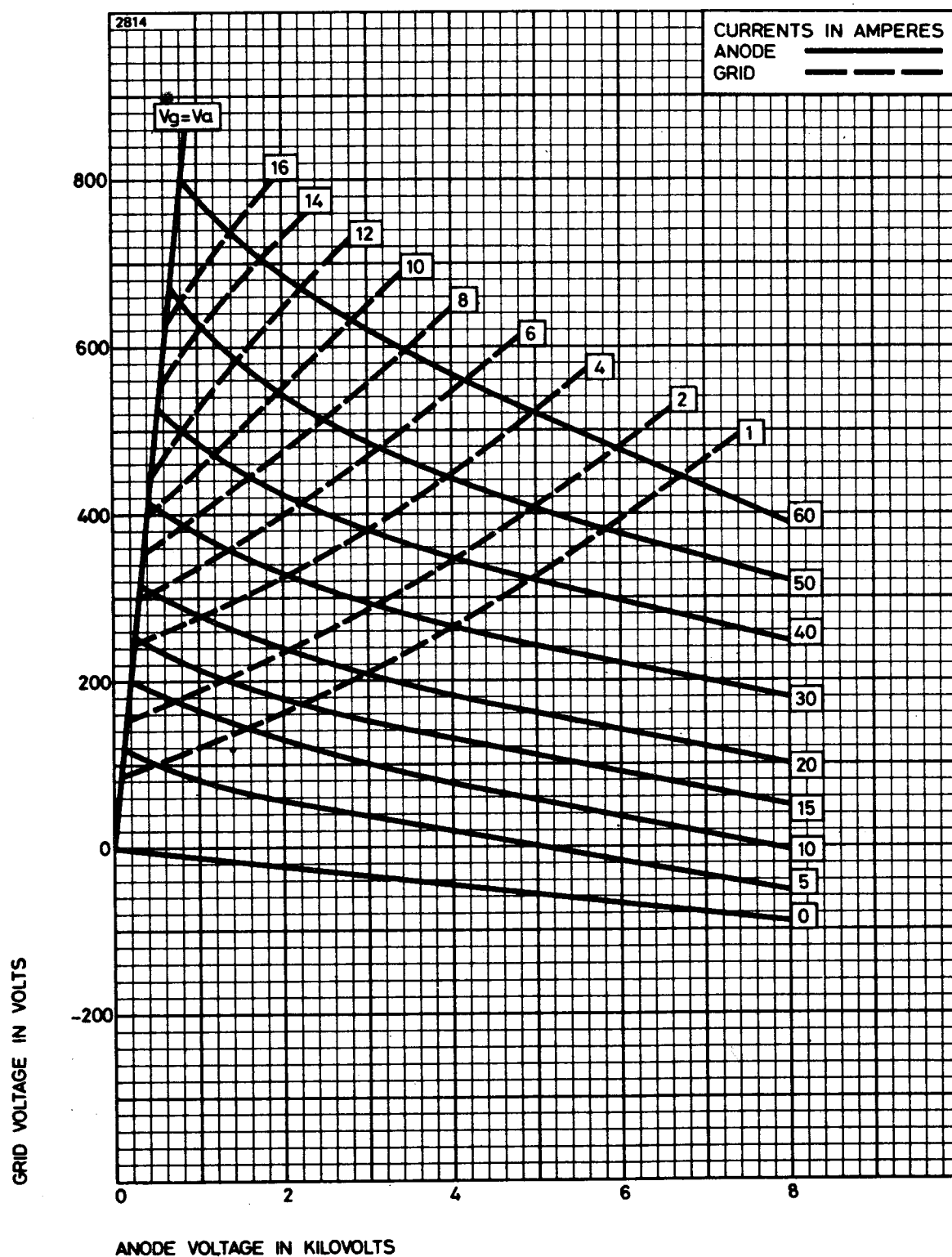
TYPICAL ANODE CHARACTERISTICS



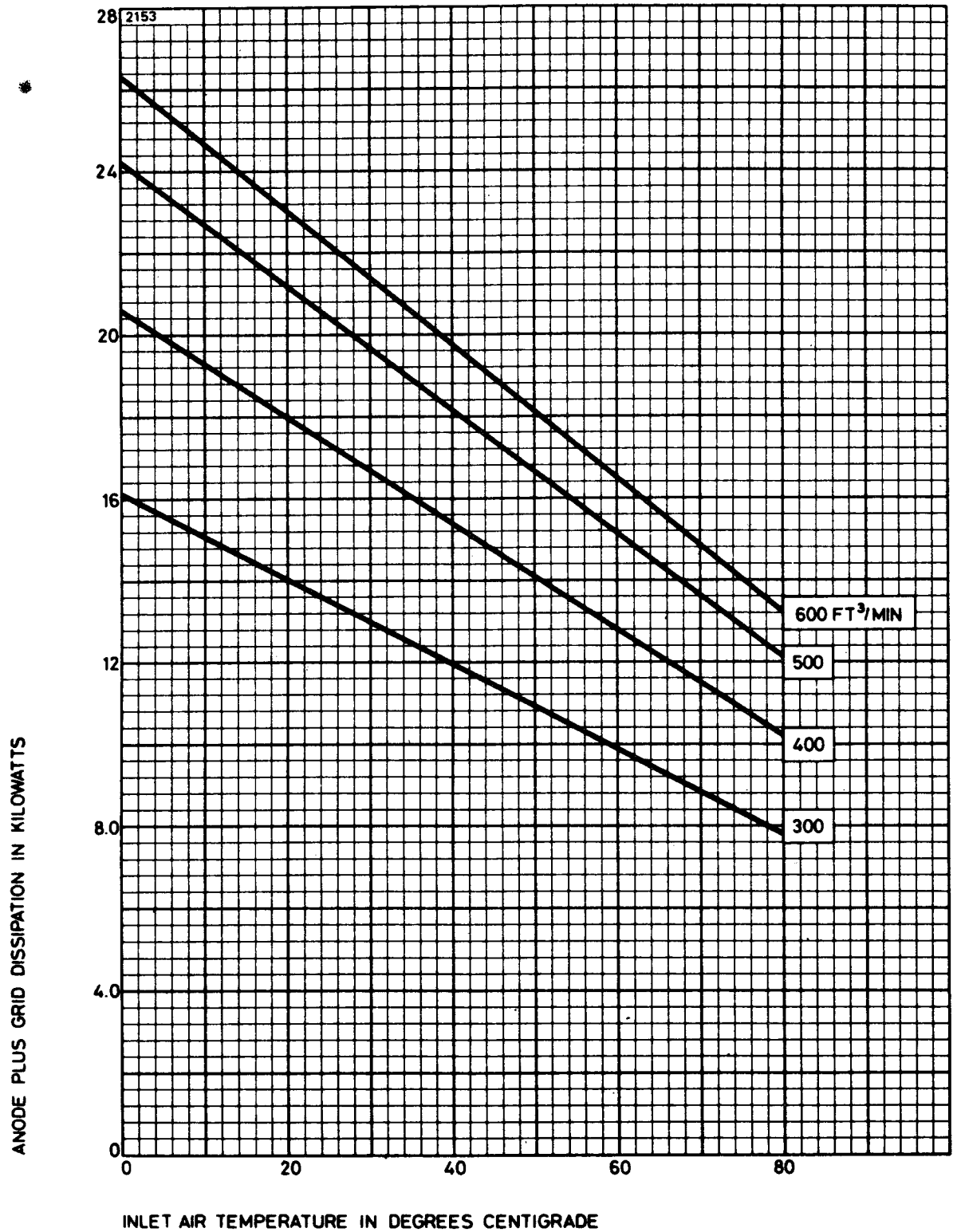
TYPICAL GRID CHARACTERISTICS



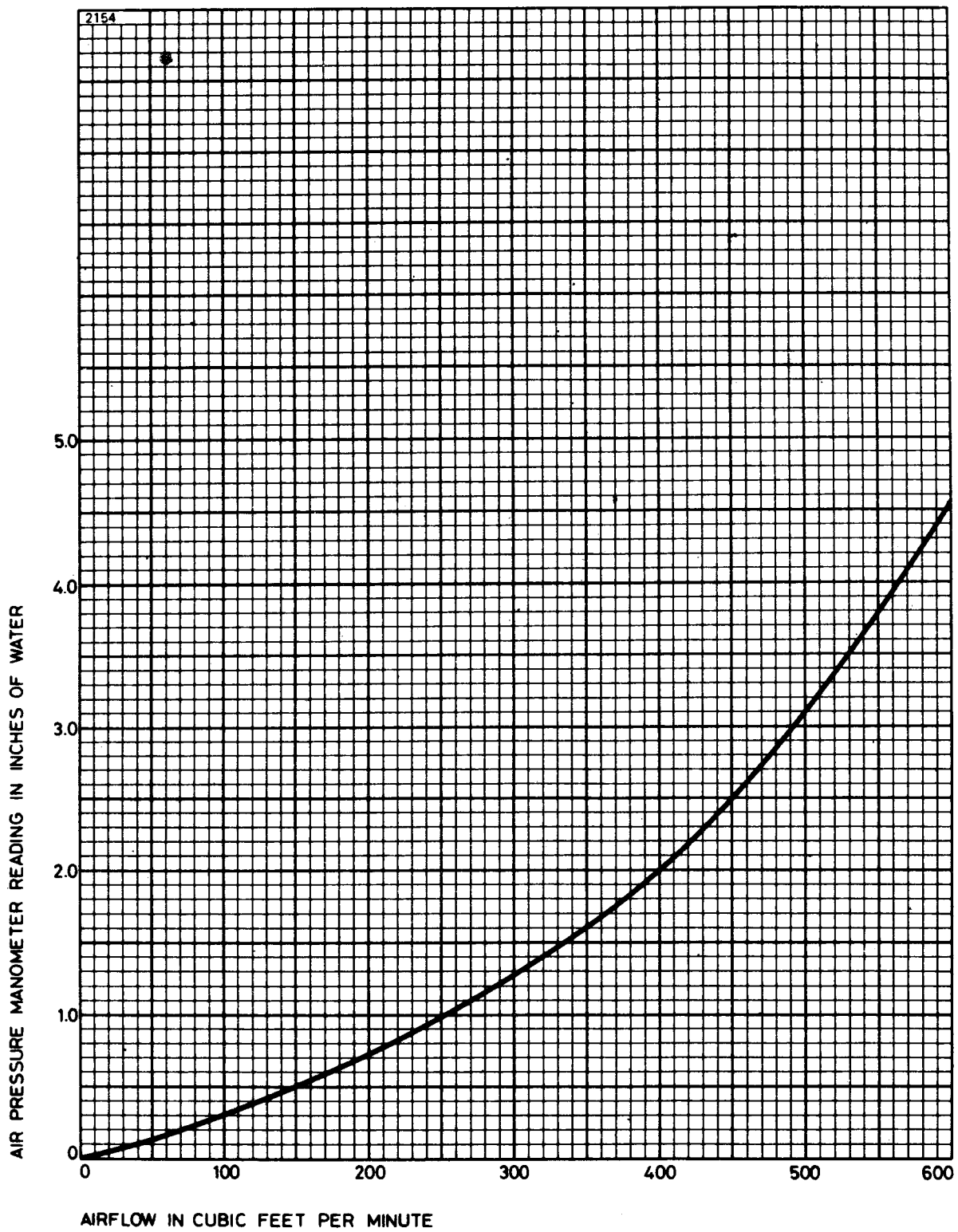
TYPICAL CONSTANT CURRENT CHARACTERISTICS



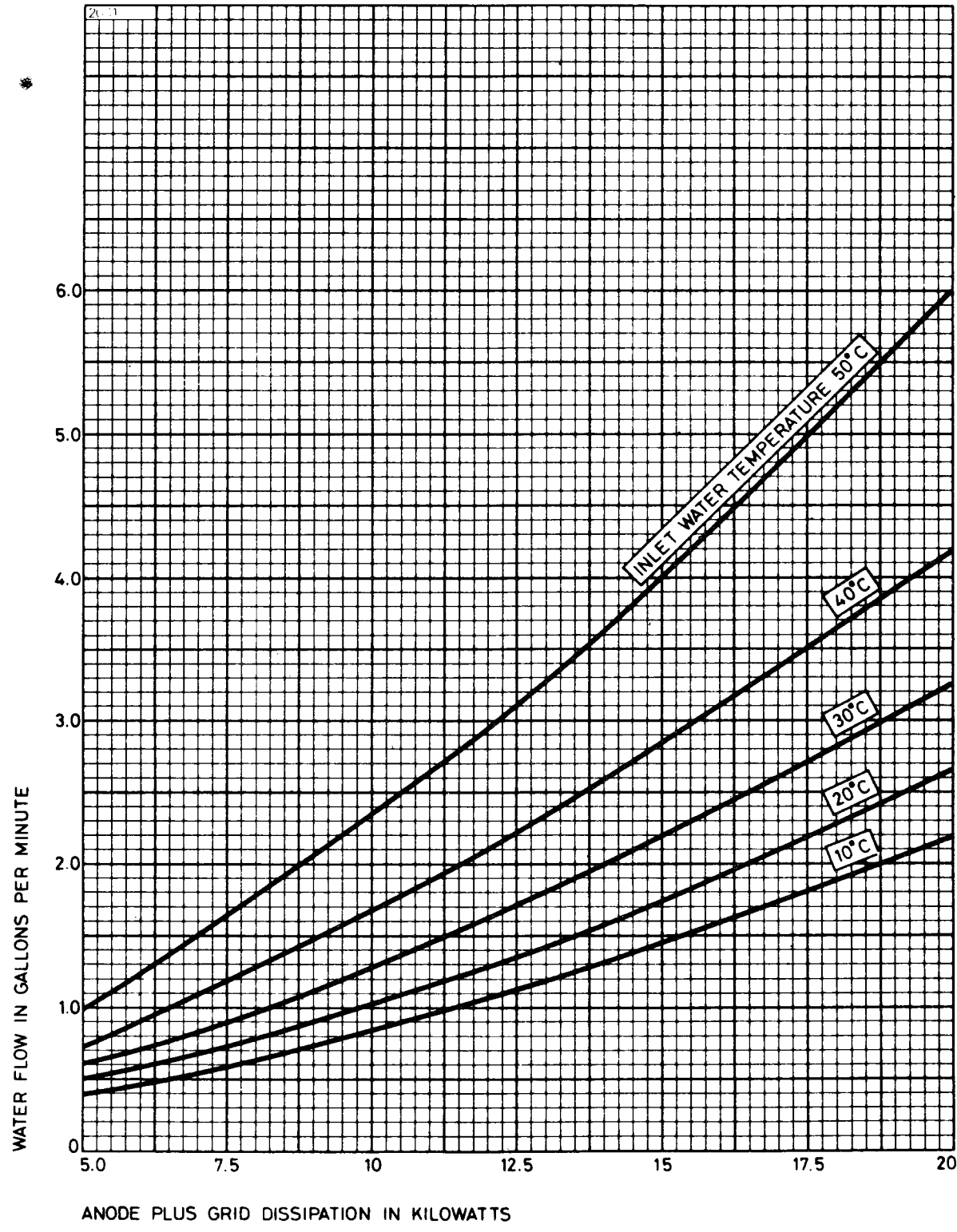
AIR COOLING REQUIREMENTS FOR BR1183



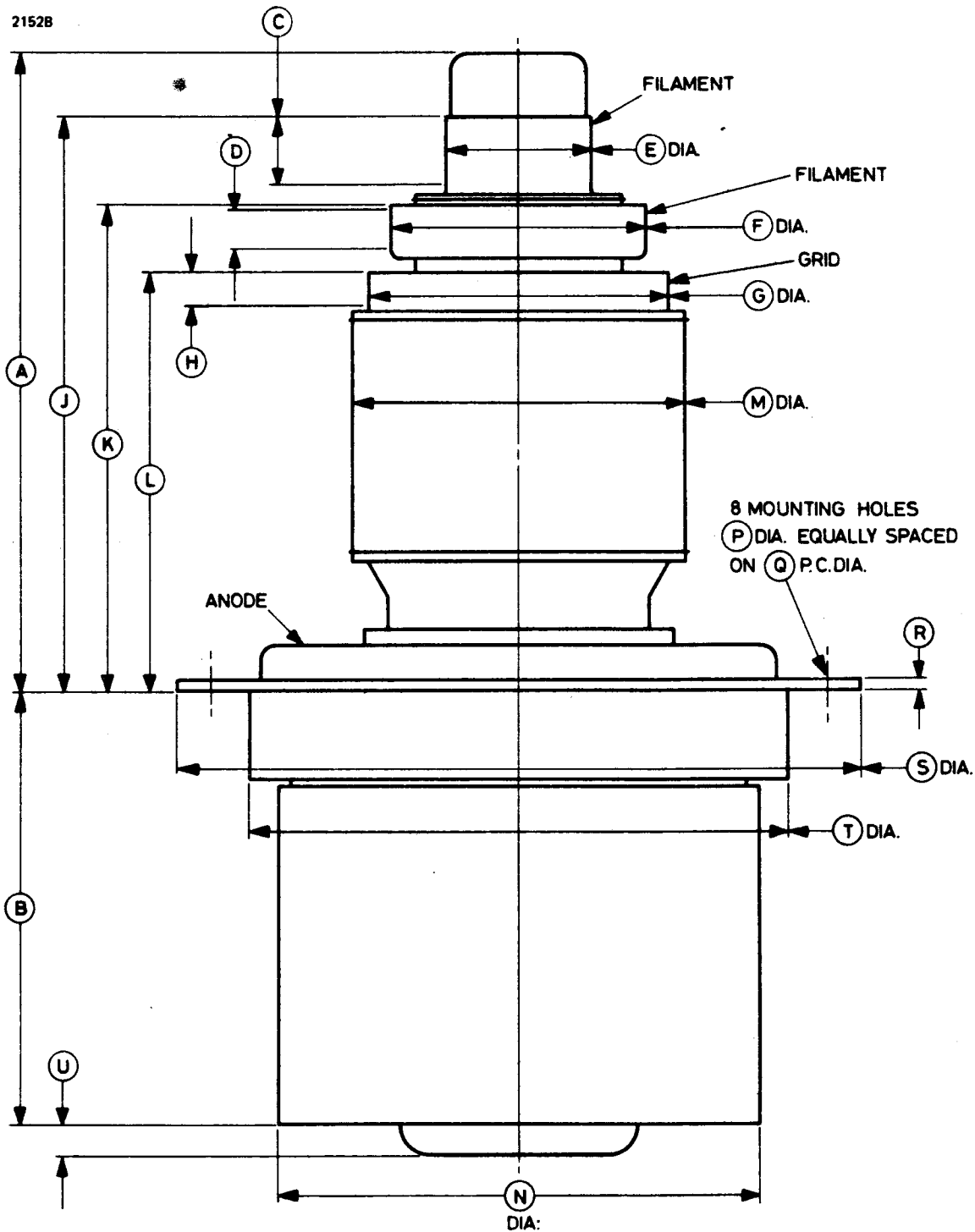
TYPICAL AIR FLOW CHARACTERISTIC FOR BR1183



MINIMUM WATER COOLING REQUIREMENTS FOR BW1183J1



OUTLINE FOR BR1183



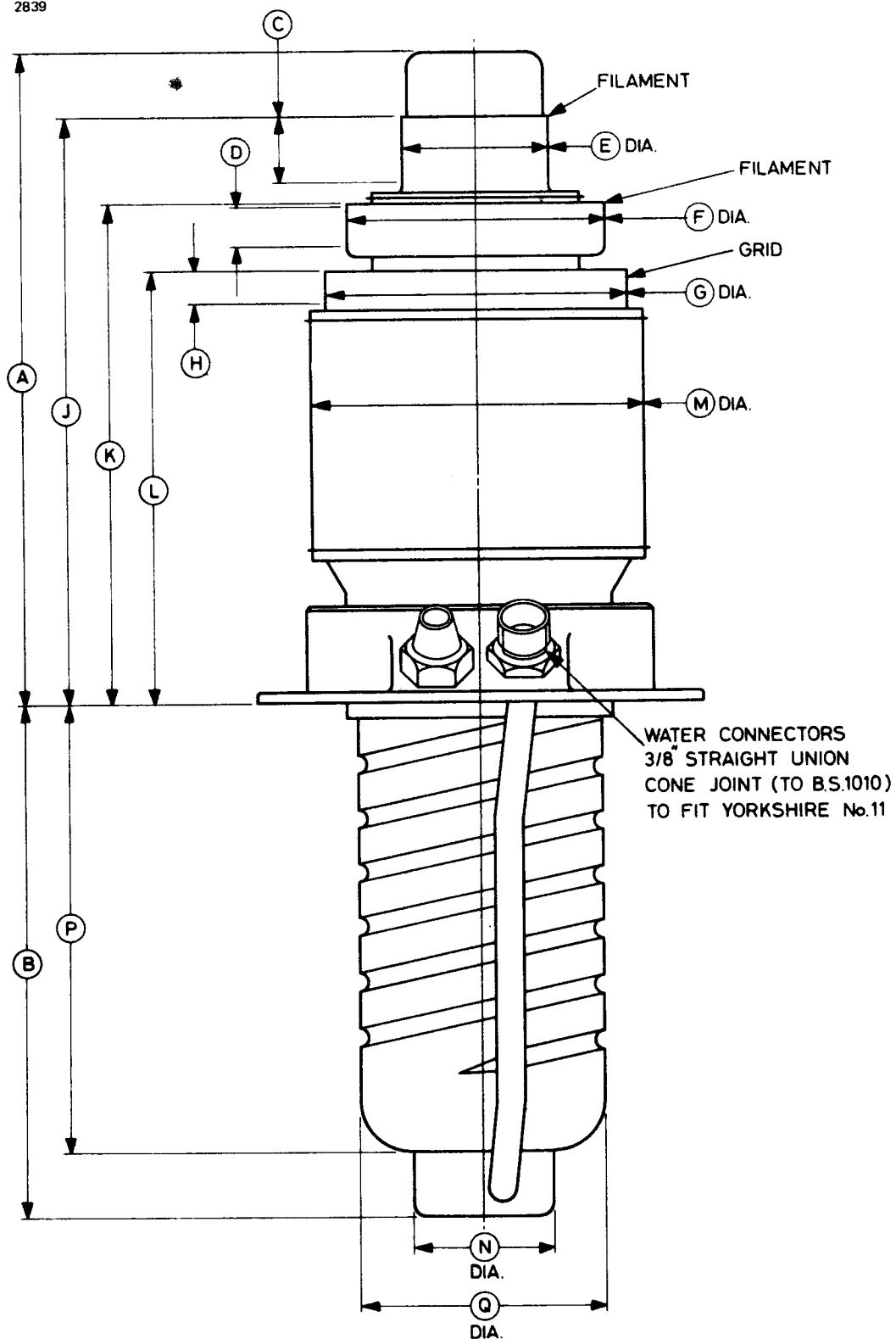
Outline Dimensions for BR1183 (All dimensions without limits are nominal)

Ref	Millimetres	Inches
A *	235.0	9.252
B	160.0	6.299
C	25.0	0.984
D	15.0	0.591
E	54.0	2.126
F	96.0	3.780
G	112.0	4.409
H	14.0	0.551
J	212.0	8.347
K	179.0	7.047
L	155.0	6.102
M	124.0	4.882
N	179.5 max	7.067 max
P*	9.53	0.375
Q*	228.6	9.000
R	4.76	0.187
S	254.0 $\pm$ 1.5	10.000 $\pm$ 0.059
T	200.0 $\pm$ 1.5	7.874 $\pm$ 0.059
U	11.2	0.441

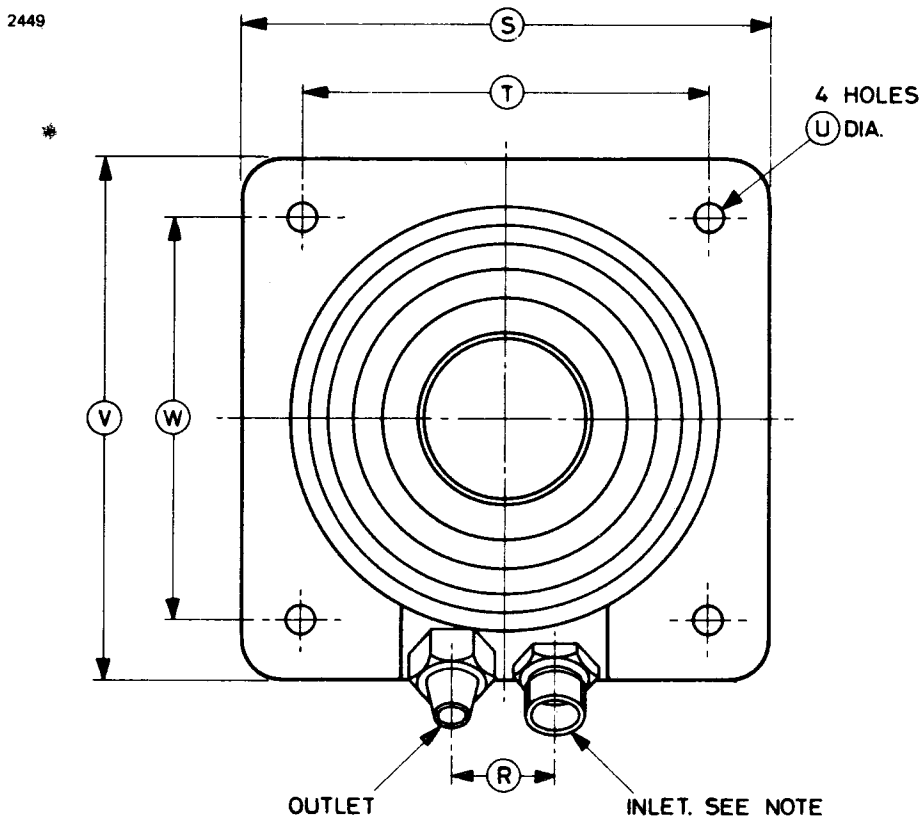
Inch dimensions have been derived from millimetres except where marked *.

OUTLINE FOR BW1183J1 (All dimensions without limits are nominal)

2839



Outline Detail for BW1183J1



Ref	Millimetres	Inches	Ref	Millimetres	Inches
A	240.0 max	9.449 max	M	124.0	4.882
B	191.5 max	7.539 max	N	51.0 $\pm$ 1.5	2.008 $\pm$ 0.059
C	25.0	0.984	P	166.5	6.555
D	15.0	0.591	Q	90.0 $\pm$ 1.5	3.543 $\pm$ 0.059
E	54.0	2.126	R	31.75	1.25
F	96.0	3.780	S	165.0 $\pm$ 3.0	6.496 $\pm$ 0.118
G	112.0	4.409	T	127.0 $\pm$ 1.5	5.000 $\pm$ 0.059
H	14.0	0.551	U	9.5	0.374
J	216.0	8.504	V	165.0 $\pm$ 3.0	6.496 $\pm$ 0.118
K	183.0	7.205	W	127.0 $\pm$ 1.5	5.000 $\pm$ 0.059
L	160.0	6.299			

Inch dimensions have been derived from millimetres.

Note If the valve is mounted filament terminals down, the water flow must be opposite to the direction shown.