

SPECIAL VALVES

Forced-Air-Cooled

Industrial Triode

Code: 3J/187E (Glass/metal envelope)
3JC/187E (Ceramic/metal envelope)

The 3J/187E and 3JC/187E, designed specifically for industrial heating applications, are capable of operation at frequencies up to 120 and 300 MHz respectively. Design features give a high mutual conductance, resulting in high efficiency with the low grid dissipation and large safety factor which are desirable when the valves are operated under variable-load conditions.

CATHODE

Thoriated-tungsten filament

Filament voltage	5	V
Nominal current	78	A
Maximum usable emission (Note 1)	10	A
Cold filament resistance	0.0075	Ω

Note 1.—For a filament supply regulated to ± 5 per cent.

It is recommended that some resistance or reactance be introduced into the filament supply to limit the surge peak current to about two and a half times the normal r.m.s. working value. This impedance may be short circuited as soon as the surge has decayed.

For operation at high frequencies (above 30 MHz) it is recommended that the r.f. return path to the cathode makes connection to the larger filament terminal.

CHARACTERISTICS

Amplification factor	$\left\{ V_a = 2kV : I_a = 0.25A \right\}$	12	
Mutual conductance	$\left\{ V_a = 2kV : V_g = -75V \right\}$	22	mA/V

DIRECT INTERELECTRODE CAPACITANCES

Grid to anode	29	pF
Grid to filament	54	pF
Anode to filament	1.5	pF

July 1967

3J/187E } —1
3JC/187E }

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C O M P O N E N T S G R O U P

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COOLING REQUIREMENTS

For air-cooling requirements see graphs on page 6.

	3J/187E	3JC/187E	
Maximum radiator core temperature	220	220	°C
Maximum seal temperature (Note 2)	180	220	°C

Note 2.—To ensure that the stem seals are kept below the stated temperatures it is necessary to direct into the grid flange a flow of cooling air of the order of 10 to 50 ft³/min (0.28 to 1.42 m³/min) dependent upon the circuit and frequency conditions.

MECHANICAL DATA

Dimensions As shown in outline drawings.
Mounting position Vertical: Anode upward or downward.

Accessories

The following approved items are supplied separately under the codes indicated:

214-LVA-001A Filament connector, smaller
214-LVA-001B Filament connector, larger
214-LVA-001C Grid connector
GC10 Glass support tube (see page 9)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Class C. Industrial Heating R.F. Oscillator

MAXIMUM RATINGS

Maximum direct anode voltage (peak value of direct voltage plus ripple)	5.5	6.5	kV
Maximum direct anode current	2	2	A
Maximum direct anode dissipation (continuous)	3	3	kW
Maximum direct grid dissipation (continuous)	200	200	W
Maximum direct grid current (Note 3)	500	500	mA
Maximum negative grid bias	-1 500	-1 500	V
Maximum frequency for the above ratings			
3J/187E	120	100	MHz
3JC/187E	300	220	MHz

Note 3.—This figure is given for guidance. Grid dissipation is absolute rating.

TYPICAL OPERATING CONDITIONS

Direct anode voltage	5	6	6.5	kV
Direct grid voltage	-560	-650	-720	V
Direct anode current	1.6	1.5	1.8	A
Peak r.f. grid voltage	760	890	970	V
Direct grid current (Note 4)	100 (140)	130 (190)	150 (200)	mA
Grid dissipation (Note 4)	25	55	55	W
Grid resistor	5.6	5	4.8	kΩ
Power input	8	9	11.7	kW
Output power (oscillator)	5.4	6.9	8.9	kW
Power into load at 85 per cent transfer efficiency	4.6	5.8	7.5	kW

Note 4.—Subject to wide variation dependent upon the impedance of the load circuit. The values of current shown in brackets are typical of off-load conditions but are given for guidance only: practical figures are dependent upon compensatory devices in the grid circuit.

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Class B. A.F. Power Amplifier or Modulator
(for balanced two-valve operation)

MAXIMUM RATINGS

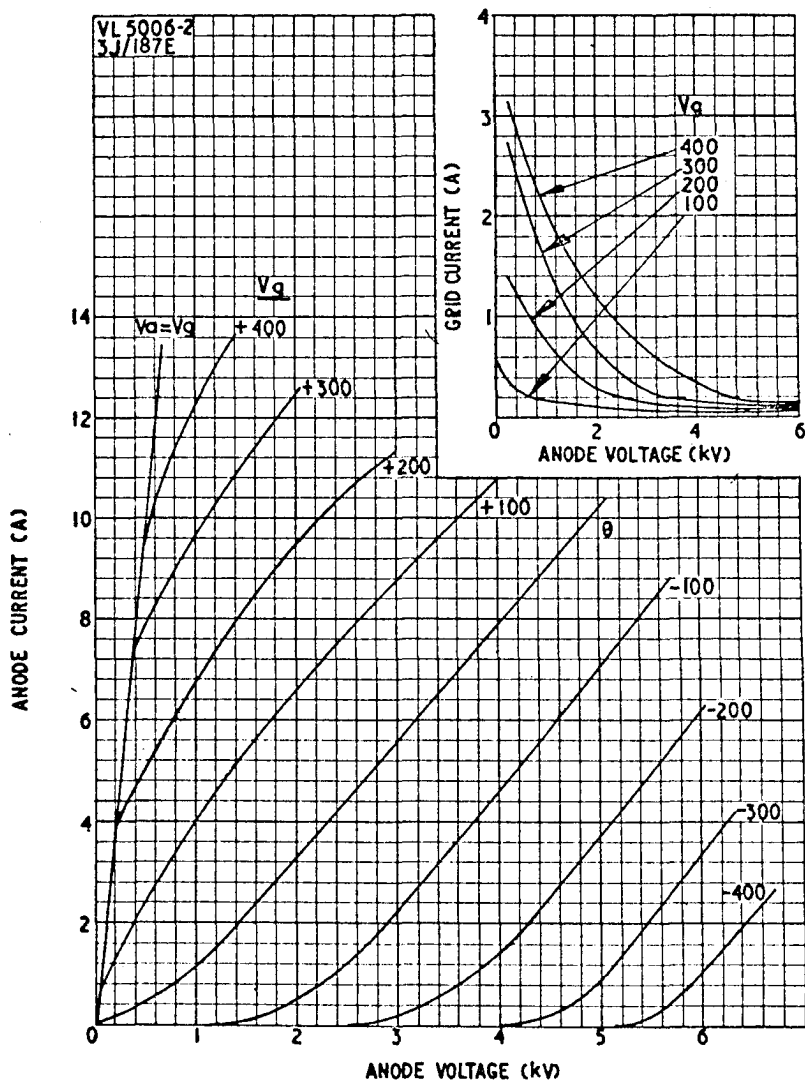
Maximum direct anode voltage	6	kV
Maximum direct anode current	2	A
Maximum direct anode dissipation (intermittent)	5	kW
Maximum direct anode dissipation (continuous)	4	kW
Maximum direct grid dissipation (continuous)	200	W
Maximum direct grid voltage	-1 500	V

TYPICAL OPERATING CONDITIONS

Direct anode voltage	5	kV
Direct grid voltage	-350	V
Direct anode current (zero signal) per valve	0.2	A
Direct anode current (maximum signal) per valve	1.9	A
Load resistor, anode to anode	2.7	k Ω
Peak a.f. grid to grid voltage	1 040	V
Grid drive power, approximately (2 valves)	85	W
Direct grid current, per valve	80	mA
Direct grid dissipation, per valve	14	W
Output power (2 valves)	12	kW

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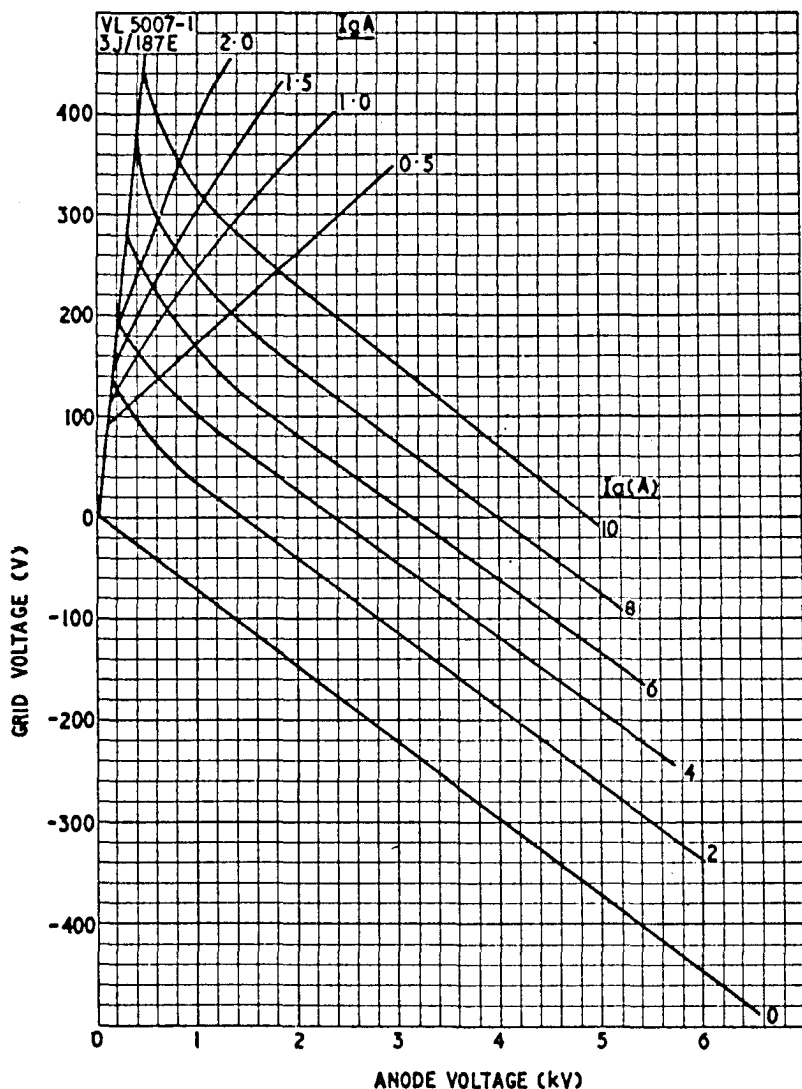


STC

3J/187E
3JC/187E

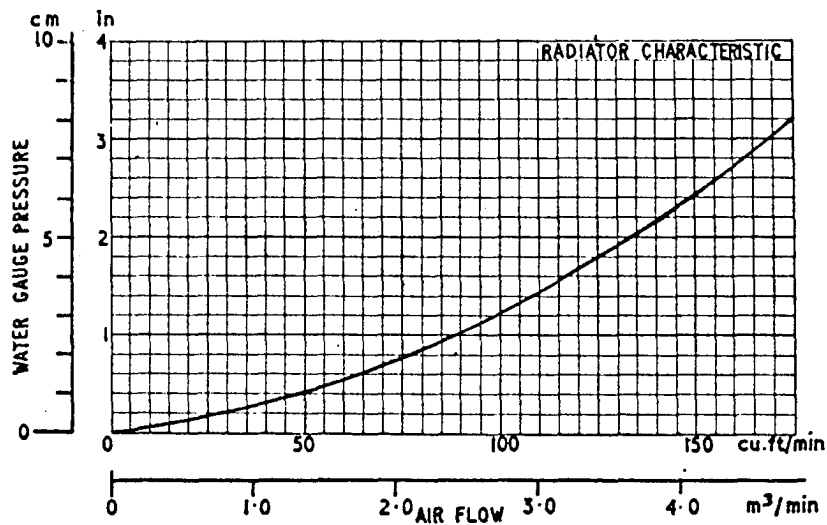
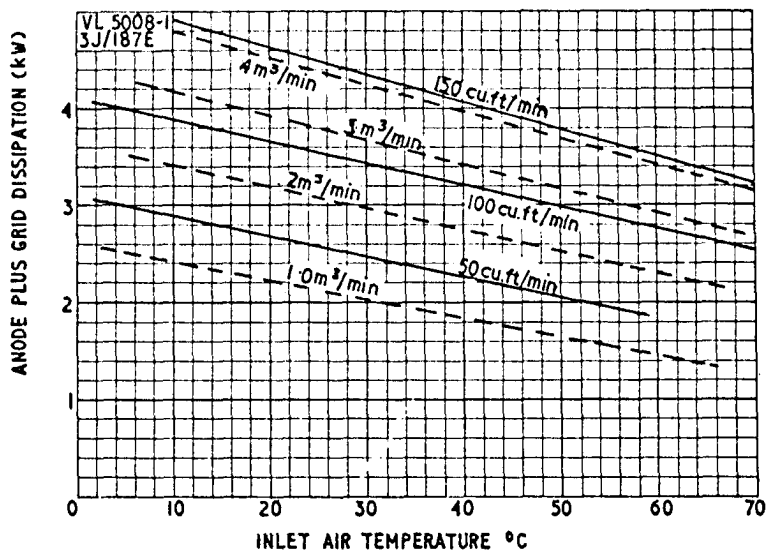
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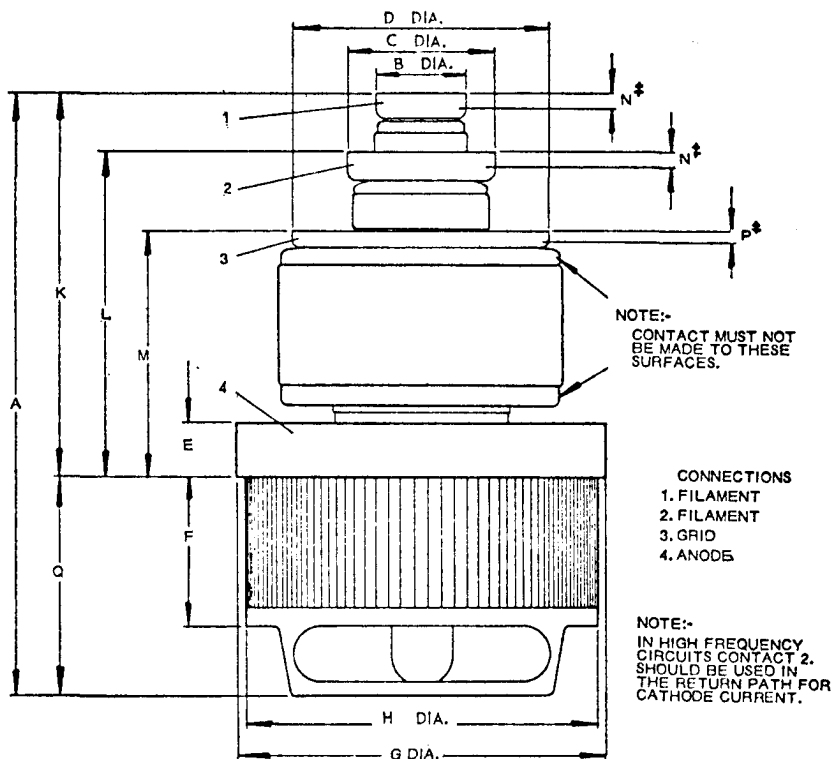
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Code: 3J/187E (Glass/metal envelope)

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3J/187E Outline



DIM.	MILLIMETRES	INCHES	DIM.	MILLIMETRES	INCHES
A	227,0 MAX.	8.15/16 MAX.	H	120,7 ± 0,8	4.3/4 ± 1/32
B	31,8 ± 0,4	1.1/4 ± 1/64	K	145,3 ± 4,8	5.23/32 ± 3/16
C	50,8 ± 0,4	2 ± 1/64	L	122,2 ± 4,8	4.13/16 ± 3/16
D	88,9 ± 0,4	3.1/2 ± 1/64	M	88,9 ± 3,2	3.1/2 ± 1/8
E	19,1 ± 1,6	3/4 ± 1/16	N	4,7 MIN. 6,4 MAX.	3/16 MIN. 1/4 MAX.
F	50,8 ± 1,6	2 ± 1/16	P	3,1 MIN. 4,8 MAX.	1/8 MIN. 3/16 MAX.
G	127,0 ± 0,8	5 ± 1/32	Q	74,6 ± 1,6	2.15/16 ± 1/16

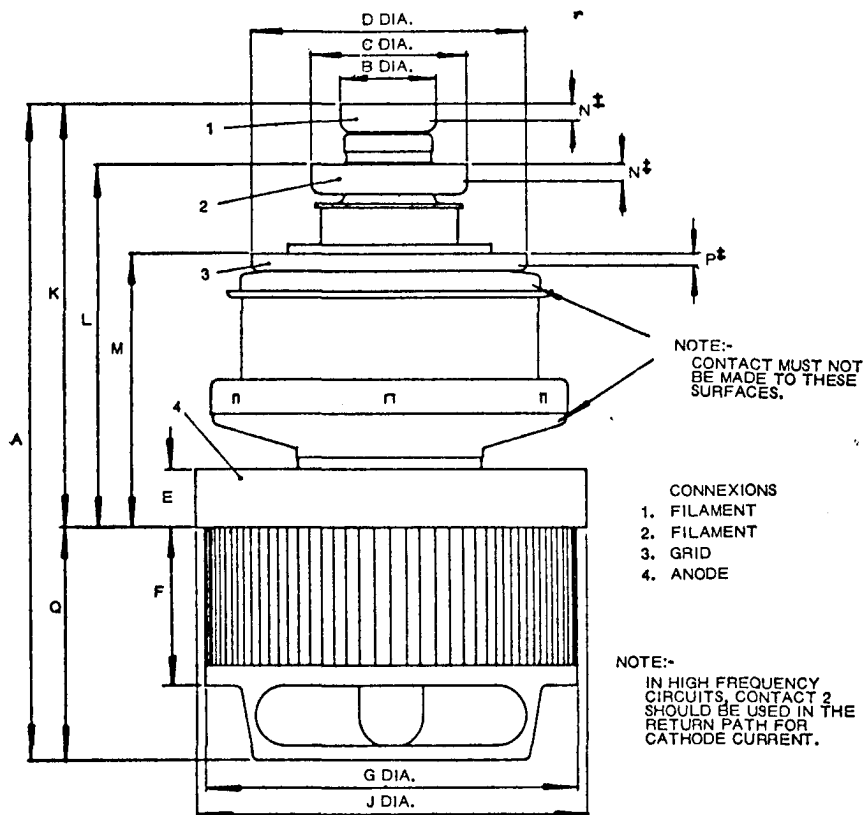
NOTE:—BASIC FIGURES ARE IN INCHES

‡ DENOTES:—CONTACT LENGTH

Code: 3JC/187E (Ceramic/metal envelope)

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3JC/187E Outline



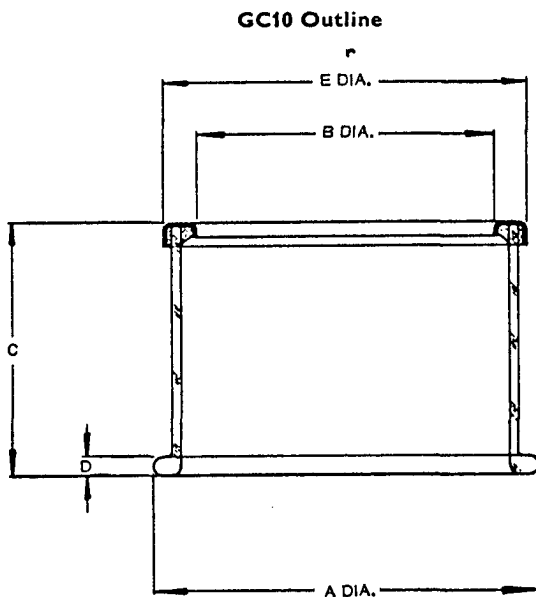
DIM.	MILLIMETRES	INCHES	DIM.	MILLIMETRES	INCHES
A	217,5 MAX.	8.9/16 MAX.	J	127,0 ± 0,8	5 ± 1/32
B	31,8 ± 0,4	1.1/4 ± 1/64	K	134,9 ± 6,4	5.5/16 ± 1/4
C	50,8 ± 0,4	2 ± 1/64	L	115,1 ± 4,8	4.17/32 ± 3/16
D	88,9 ± 0,4	3.1/2 ± 1/64	M	88,1 ± 3,2	3.15/32 ± 1/8
E	19,1 ± 1,6	3/4 ± 1/16	N	4,7 MIN. 6,4 MAX.	3/16 MIN. 1/4 MAX.
F	50,8 ± 1,6	2 ± 1/16	P	3,1 MIN. 4,8 MAX.	1/8 MIN. 3/16 MAX.
G	120,7 ± 0,8	4.3/4 ± 1/32	Q	74,6 ± 1,8	2.15/16 ± 1/16

NOTE:—BASIC FIGURES ARE IN INCHES

‡ DENOTES:—CONTACT LENGTH

GLASS SUPPORT TUBE

Code: GC10



DIM	INCHES	MILLIMETRES
A	8 MIN. 6.3/8 MAX.	152,4 MIN. 161,9 MAX.
B	4.782 $\pm$ 0.015 — 0.000	121,46 $\pm$ 0,38 — 0,00
C	4.1/16 $\pm$ 3/16	103,2 $\pm$ 4,8
D	1/4 MIN. 3/8 MAX.	6,3 MIN. 9,5 MAX.
E	5.7/8 MAX.	149,2 MAX.

BASIC DIMS. ARE INCHES