

Forced-Air-Cooled Industrial Triode

Ref.: 3J/222E

Code: 3J/222E

The 3J/222E triode has been designed specifically for industrial heating applications and is capable of operation at frequencies up to 100 Mc/s. 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 valve is operated under variable-load conditions.

CATHODE

Thoriated-tungsten filament			
Filament voltage	$8 \pm 2\%$	$8 \pm 5\%$	V
Filament current (nominal)		125	A
Maximum usable emission	36	24	A
Filament cold resistance (nominal)		0.0085	Ω

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

PIRANI TEST*

I_f	12	A
V_f range	0.12 to 0.15	V
Approx. measuring time	60	min

* See card supplied with individual valve for actual test figures.

CHARACTERISTICS

Amplification factor	{ at V_a 2kV, I_a 0.5A }	16	
Mutual conductance	{ at V_a 2kV, $V_g - 87V$ }	60	mA/V

DIRECT INTERELECTRODE CAPACITANCES

Grid to anode	50	pF
Grid to filament	80	pF
Anode to filament	3	pF

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3J/222E—1

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ITT

COMPONENTS

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COOLING REQUIREMENTS

For air-cooling requirements see Figure 3.

Maximum radiator core temperature	220	°C
Maximum seal temperature	180	°C

Forced-air-cooling of grid and filament, seals is required to limit their temperature to below the maximum permissible value of 180°C

If the rate of air flow through the radiator is less than 350 ft³/min care should be taken to ensure that the maximum grid seal temperature is not exceeded especially at high operating frequencies.

MECHANICAL DATA

Dimensions	As shown in Figure 4		
Net weight, approximately	18 lb	8,2	kg
Mounting position.	Vertical, anode downwards		

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
GC11	Glass support tube

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Class C. Industrial Heating R.F. Oscillator

Maximum Ratings

Maximum anode voltage (peak value of direct voltage plus ripple)	7	kV
Maximum direct anode current	6	A
Maximum direct anode dissipation (continuous)	10	kW
Maximum direct grid dissipation (continuous)	500	W
Maximum direct grid current (Note 2)	1.4	A
Maximum negative grid bias	-1 500	V
Maximum frequency for above ratings	30	MHz

Note 2.—This figure is given for guidance. Grid dissipation is absolute rating.

Typical Operating Conditions

Direct anode voltage	6	kV
Direct grid voltage	-660	V
Direct anode current	5.6	A
Peak r.f. grid voltage	930	V
Direct grid current (Note 3)	750 (1 200)	mA
Grid dissipation (Note 3)	260	W
Grid resistor	900	Ω
Power input	33.6	kW
Output power (oscillator)	26	kW
Power into load at 85% transfer efficiency	21	kW

Note 3.—Subject to wide variation dependent upon the impedance of the load circuit.

The value of current shown in brackets is typical of off-load conditions and is given for guidance only: a practical figure is dependent upon compensatory devices in the grid circuit.

Fig. 1.—Anode Current and Grid Current versus Anode Voltage

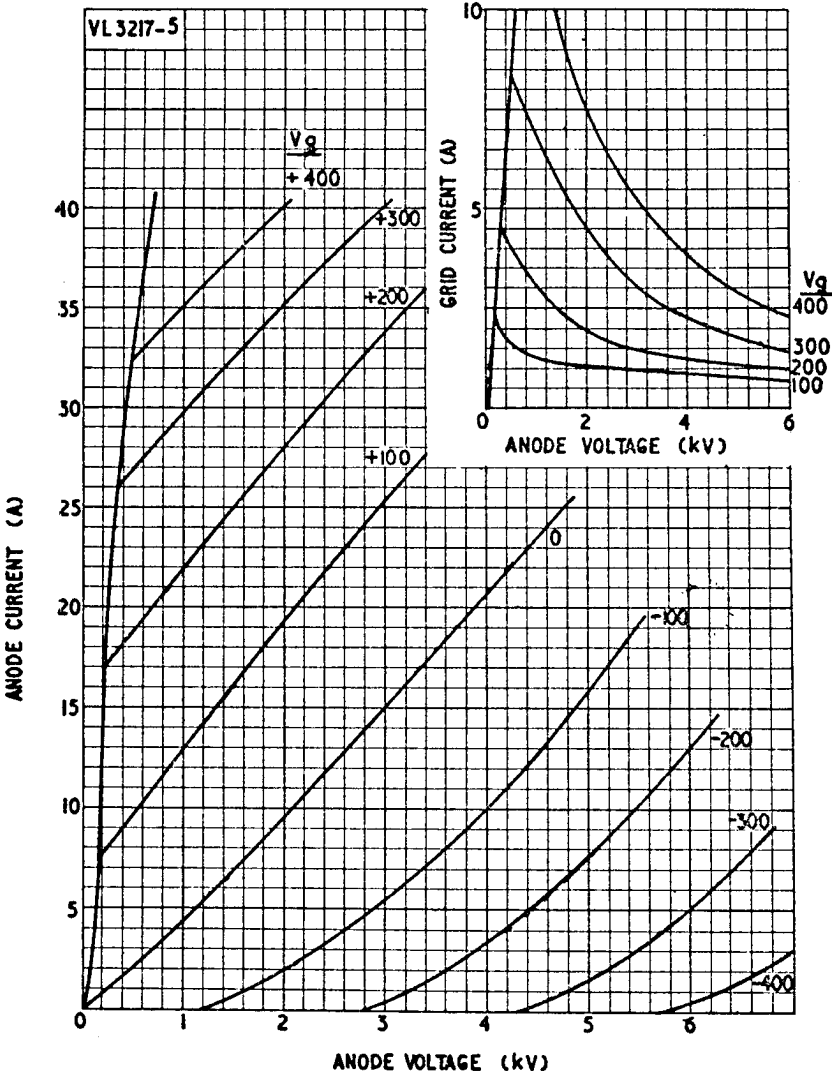


Fig. 2.—Grid Voltage versus Anode Voltage

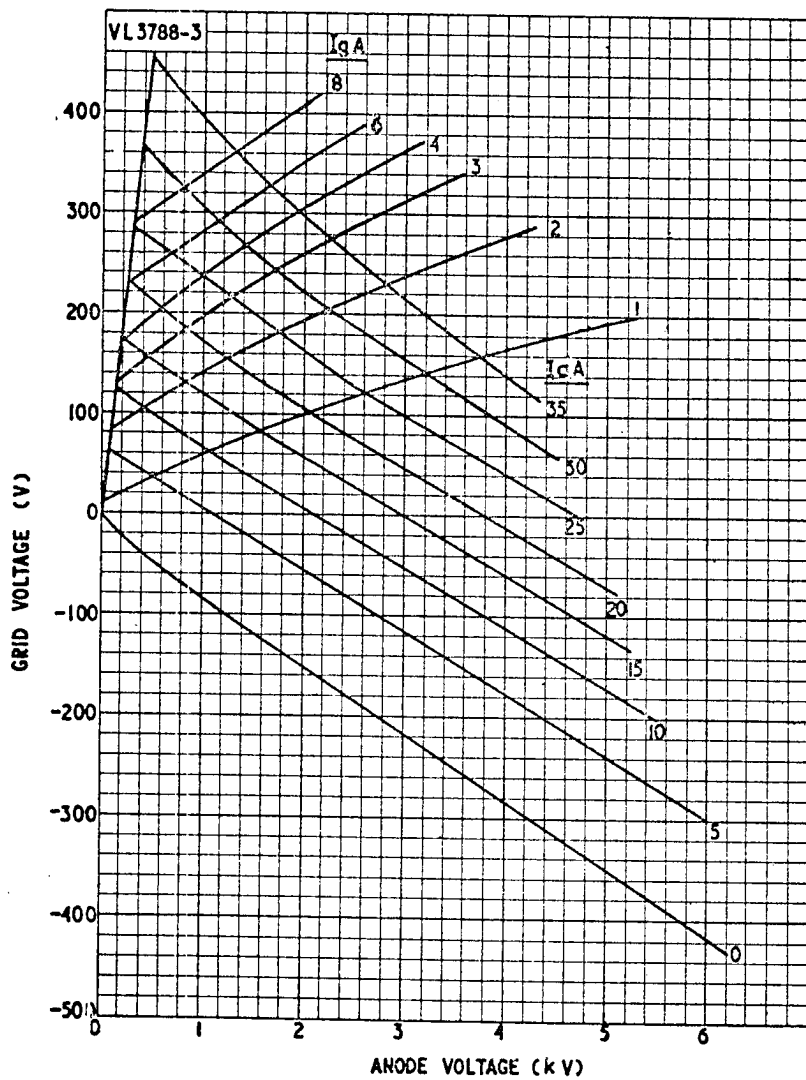
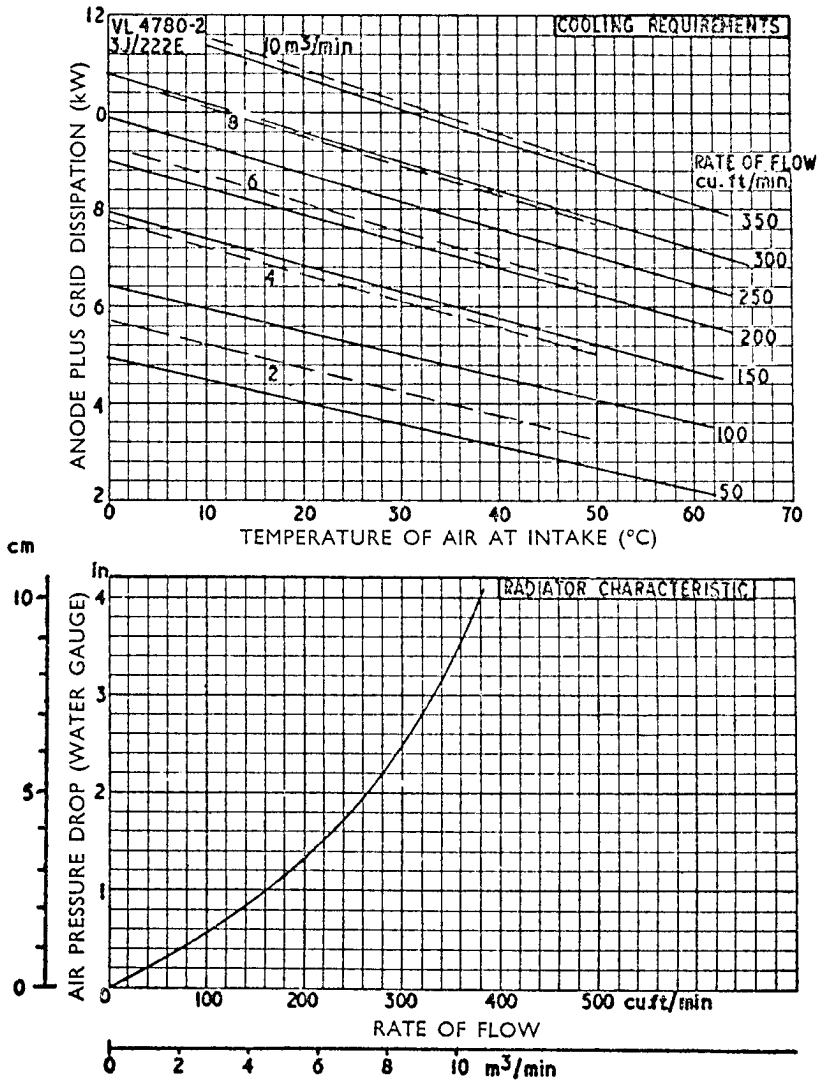
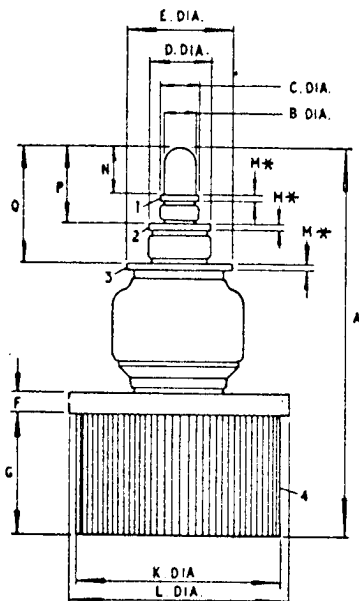


Fig. 3.—Cooling Requirements and Radiator Characteristics





CONNEXIONS

1. FILAMENT
2. FILAMENT
3. GRID
4. ANODE

DIM.	MILLIMETRES	INCHES	DIM.	MILLIMETRES	INCHES
A	311,2 MAX.	12 1/2 MAX.	J		
B	25,4 MAX.	1 MAX.	K	169,9 ± 1,6	6 11/16 ± 1/8
C	31,8 ± 0,4	1 1/2 ± 1/16	L	182,6 ± 0,8	7 1/8 ± 3/32
D	50,8 ± 0,4	2 ± 1/16	M*	4,76 MIN. 6,35 MAX.	1/8 MIN. 1/4 MAX.
E	88,9 ± 0,4	3 1/2 ± 1/16	N	38,1 ± 1,6	1 1/2 ± 1/8
F	19,0 ± 1,6	3/4 ± 1/16	P	60,3 ± 4,8	2 3/8 ± 1/4
G	95,3 ± 1,6	3 3/4 ± 1/8	Q	95,3 ± 4,8	3 3/4 ± 1/8
H					

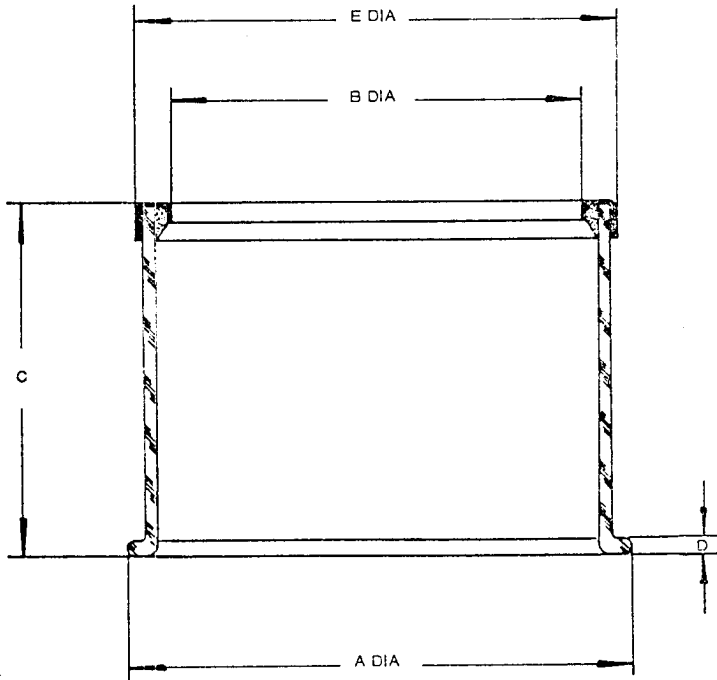
NOTE: BASIC FIGURES ARE IN INCHES

* DENOTES: CONTACT LENGTH

GLASS SUPPORT TUBE

Code: GC11

GC11 Outline



DIM	INCHES	MILLIMETRES
A	8 MIN 8.3/8 MAX	203,2 MIN 212,7 MAX
B	6.13/16 ± 1/32	173,0 ± 0,8
C	5.25/32 ± 5/32	146,8 ± 4,0
D	1/4 MIN 3/8 MAX	6,3 MIN 9,5 MAX
E	7.3/4 MAX	196,9 MAX

BASIC DIMENSIONS ARE INCHES