# Forced-Air-Cooled Industrial Triode

## 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 ± 2% | 8 ± 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 |



**ITT Components Group Europe**
**Standard Telephones and Cables Limited**
Valve Product Division, Brixham Road, Paignton, Devon
Telephone: Paignton 50762 (STD Code 0803). Telex: 42830

## 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

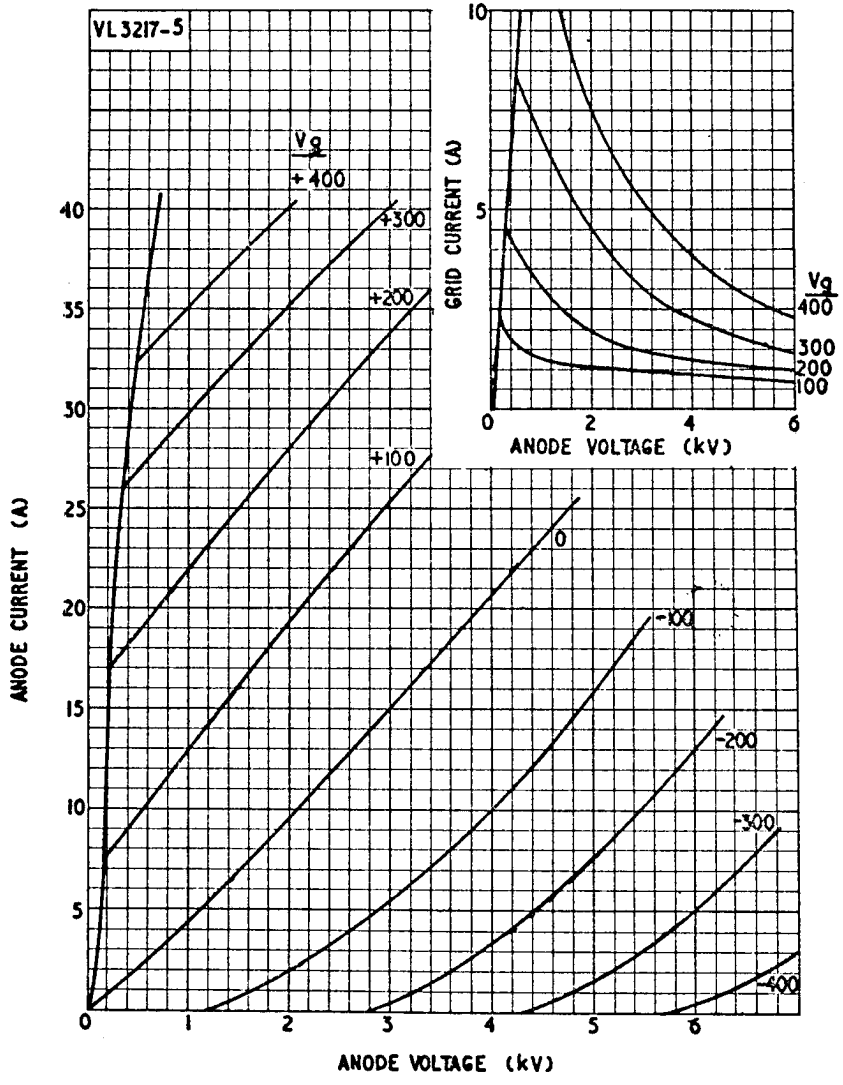


Fig. 2.—Grid Voltage versus Anode Voltage

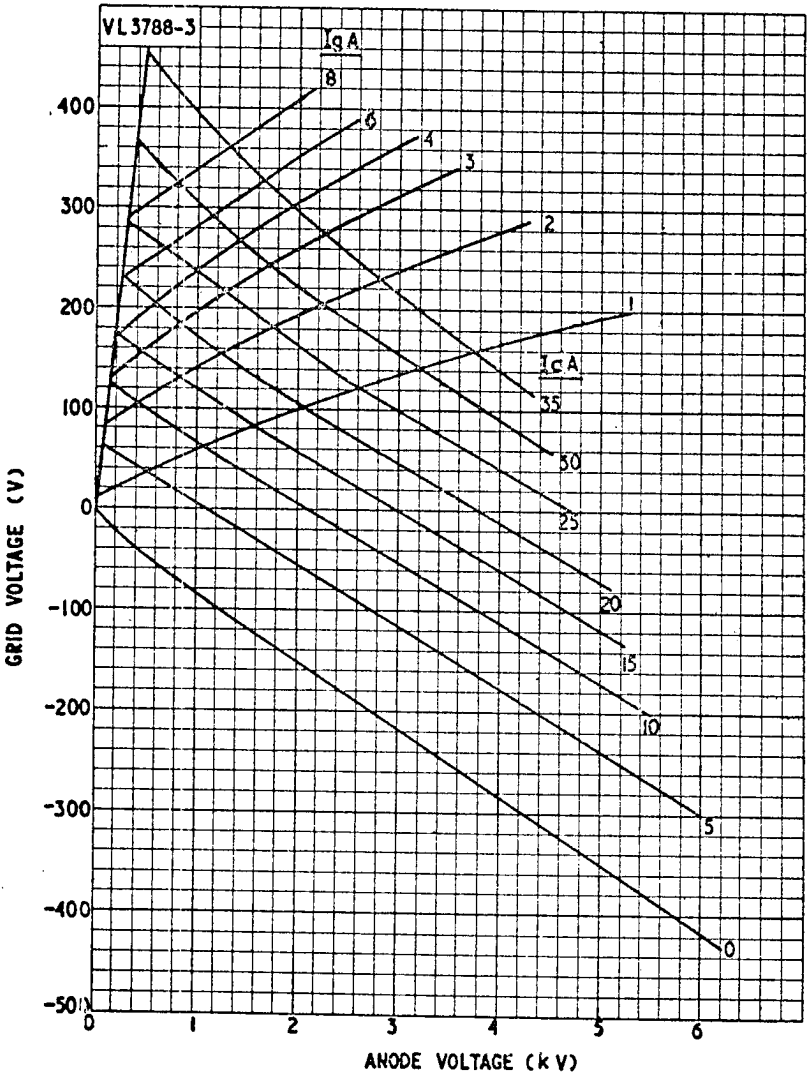
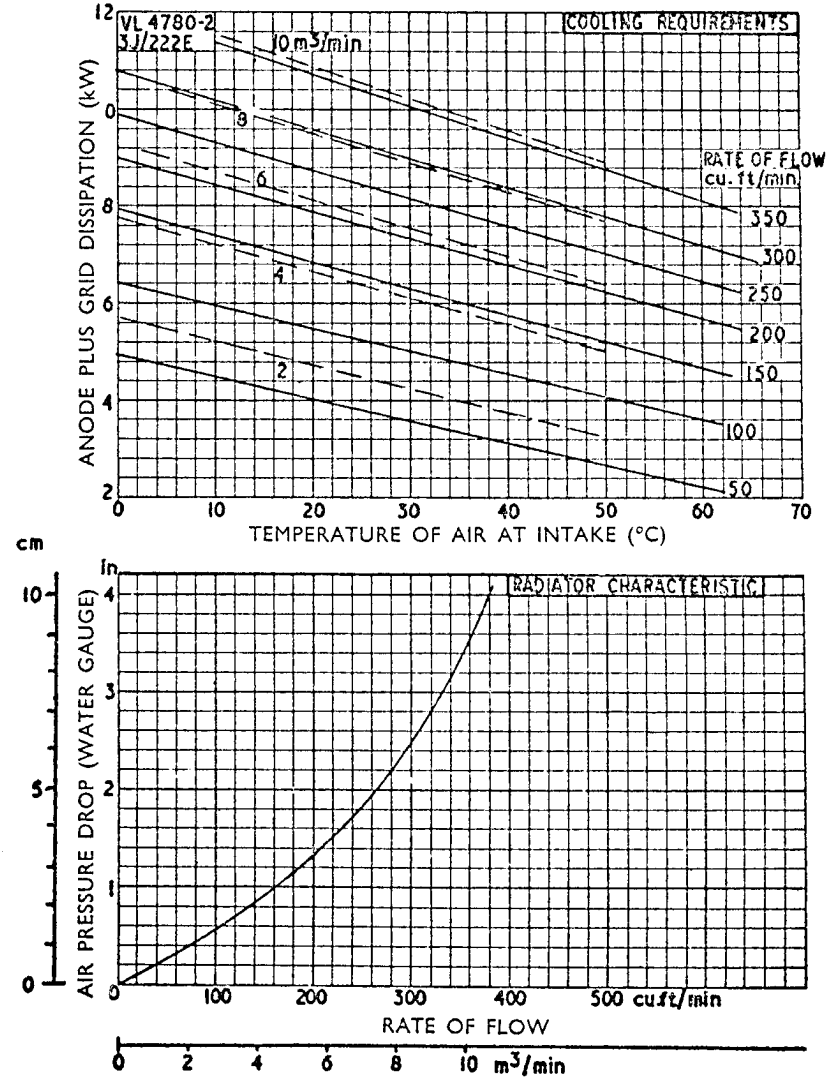
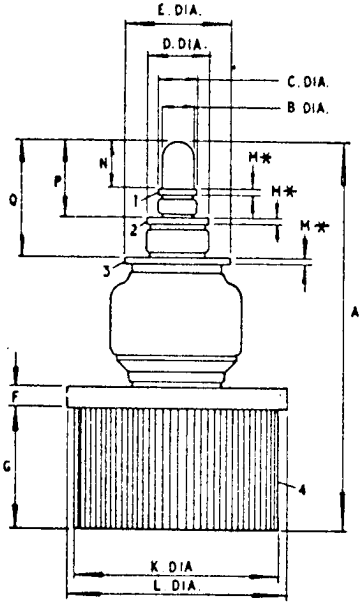


Fig. 3.—Cooling Requirements and Radiator Characteristics






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

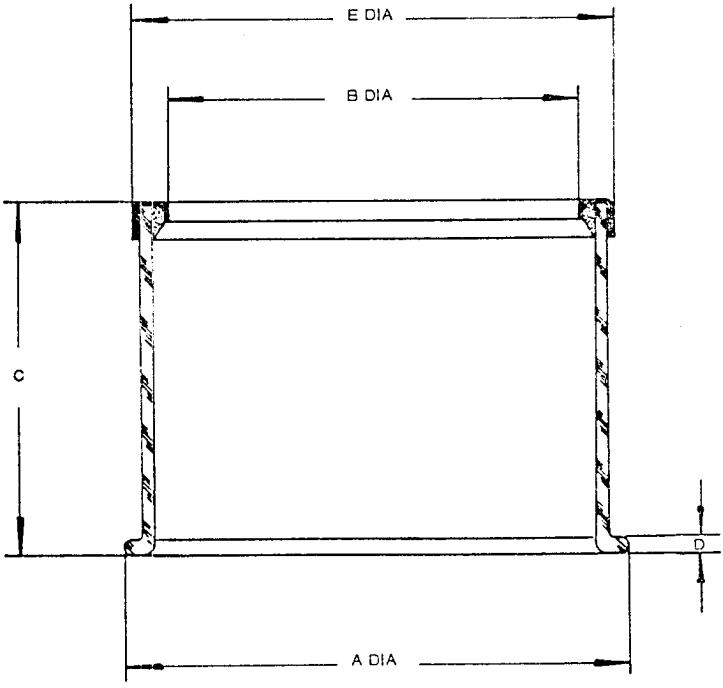
| DIM. | MILLIMETRES | INCHES | DIM. | MILLIMETRES | INCHES |
|---|---|---|---|---|---|
| A | 311,2 MAX. | 12¼ MAX. | J | | |
| B | 25,4 MAX. | 1 MAX. | K | 169,9 ± 1,6 | 6 11/16 ± 1/16 |
| C | 31,8 ± 0,4 | 1¼ ± 1/64 | L | 182,6 ± 0,8 | 7 3/16 ± 1/32 |
| D | 50,8 ± 0,4 | 2 ± 1/64 | M* | 4,76 MIN. 6,35 MAX. | 3/16 MIN. ¼ MAX. |
| E | 88,9 ± 0,4 | 3½ ± 1/64 | N | 38,1 ± 1,6 | 1½ ± 1/16 |
| F | 19,0 ± 1,6 | ¾ ± 1/16 | P | 60,3 ± 4,8 | 2 3/8 ± 3/16 |
| G | 95,3 ± 1,6 | 3¾ ± 1/16 | Q | 95,3 ± 4,8 | 3¾ ± 3/16 |
| 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