

QUICK REFERENCE DATA (maximum values)

Inert gas-filled triode for power control and ignitor firing.

Peak anode voltage	1.5	kV
Cathode current		
Peak	30	A
Average	2.5	A

This data should be read in conjunction with DEFINITIONS AND GENERAL OPERATIONAL RECOMMENDATIONS—THYRATRONs, which precede this section of the handbook.

CHARACTERISTICS AND RANGE VALUES FOR EQUIPMENT DESIGN

The values given state the range over which the valve will operate. No allowance has been made in the data for supply voltage and component variations.

Anode

Peak anode operating voltage (forward and inverse)

$$I_{k(av)} \leq 1.6A, I_{k(pk)} \leq 20A$$

1.5 kV

$$I_{k(av)} > 1.6A$$

1.25 kV

Anode voltage drop (approx.)

10 V

Anode-to-grid capacitance

350 pF

Commutation factor

10 VA/ μs^2

Ignition delay time

see page C2

Grid

Maximum negative grid voltage

Before conduction

-300 V

During conduction

-10 V

Maximum positive grid current during the time that the anode voltage is more positive than -10V

Peak

1.25 A

Average (maximum averaging time = 20ms)

100 mA

Maximum peak positive grid current during the time that the anode voltage is more negative than -10V

5.0 mA

Grid-to-cathode capacitance

10 pF

Grid resistance

Maximum

100 k Ω

Minimum

See page C3

Recovery (deionisation) time (approx.)

$$V_g = -250V$$

200 μs

$$V_g = -100V$$

300 μs

Critical grid current at $V_a = 1.5kV$

< 20 μA

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(Formerly XR1-1600A)

Cathode

Maximum cathode current (see note 1)

Peak (25c/s and above) see note 5

$V_a \leq 1.25\text{kV}$

30 A

$V_a = 1.5\text{kV}$

20 A

Average (see page C4)

Maximum averaging time = 15s, $V_a = 1.5\text{kV}$

1.6 A

Maximum averaging time = 10s, $V_a \leq 1.25\text{kV}$

2.5 A

Surge (fault protection, maximum duration, = 0.1s)
see note 3

300 A

Minimum cathode heating time (see note 2)

$i_{k(pk)} \leq 20\text{A}$

10 s

$i_{k(pk)} > 20\text{A}$

30 s

Filament voltage (see note 5)

2.5 V

Filament current range at 2.5V and $I_k = 0\text{A}$

7.5 to 9.5 A

Mechanical

Type of cooling

Convection

Mounting position

Any between horizontal
and vertical with base down

Net weight (approx.)

$\left\{ \begin{array}{l} 115 \\ 4.1 \end{array} \right.$ g
oz

Weight of valve in carton (approx.)

$\left\{ \begin{array}{l} 275 \\ 9.7 \end{array} \right.$ g
oz

Nominal dimensions of carton

$\left\{ \begin{array}{l} 3.5 \times 3.5 \times 8.5 \\ 90 \times 90 \times 125 \end{array} \right.$ in
mm

ABSOLUTE MAXIMUM RATINGS

It is important that these ratings are never exceeded and such variations as mains fluctuations, component tolerances and switching surges must be taken into consideration in arriving at the actual valve operating conditions.

Anode

Maximum peak anode voltage (forward and inverse)

$I_{k(av)} \leq 1.6\text{A}$, $i_{k(pk)} \leq 20\text{A}$

1.5 kV

$I_{k(av)} > 1.6\text{A}$

1.25 kV

Grid

Maximum negative grid voltage

Before conduction

-300 V

During conduction

-10 V

Maximum positive grid current during the time that
the anode voltage is more positive than -10V

Peak

1.25 A

Average (maximum averaging time = 20ms)

100 mA

Maximum peak positive grid current during the time that
the anode voltage is more negative than -10V

5.0 mA



Cathode

Maximum cathode current (see note 1)

Peak (25c/s and above) see note 5

$$V_a \leq 1.25kV$$

30 A

$$V_a = 1.5kV$$

20 A

Average (see page C4)

$$\text{Maximum averaging time} = 15s, V_a = 1.5kV$$

1.6 A

$$\text{Maximum averaging time} = 10s, V_a \leq 1.25kV$$

2.5 A

Surge (fault protection, maximum duration = 0.1s)
see note 3

300 A

Minimum cathode heating time (see note 2)

$$i_{k(pk)} \leq 20A$$

10 s

$$i_{k(pk)} > 20A$$

30 s

Heater voltage

Minimum

2.25 V

Maximum

$$(I_k > 0.5A)$$

2.75 V

$$(I_k \leq 0.5A)$$

3.0 V

Ambient temperature (see note 4)

Minimum

-55 °C

Maximum

+70 °C

OPERATING NOTES

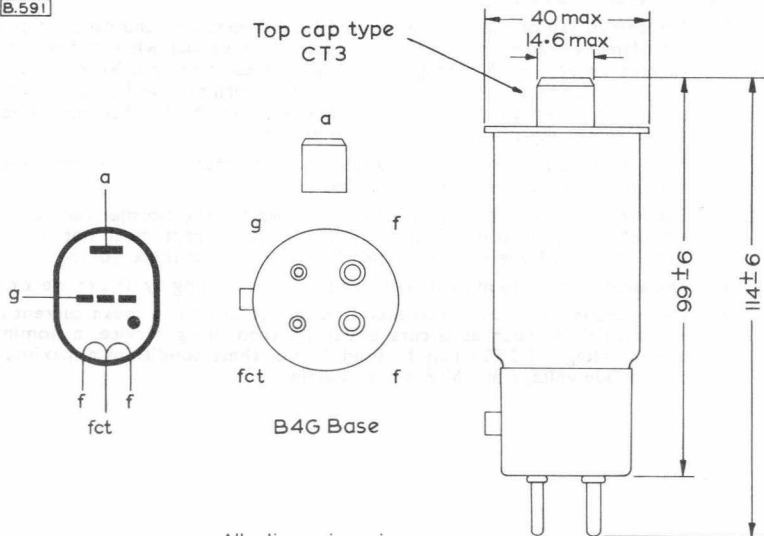
1. The centre tap of the filament should be connected to the centre tap of the filament transformer. This connection is essential when the average current exceeds 6.4A averaged over any 1 second period. When two or more valves are used with one filament transformer, the filament centre taps must never be connected together without the further connection to the centre tap of the filament transformer.
2. Peak currents greater than 20A should not be drawn until 1 minute after the application of the filament voltage.
3. The rating applies when the filament and filament transformer centre taps are connected together. The maximum surge current must not exceed 140A, if the cathode current return is to only one of these points.
4. The anode structure must be left free to ensure cooling by free convection.
5. For operation with peak currents in excess of 20A and a mean current of less than 0.5A, such as occurs under ignitron firing service, a nominal heater voltage of 2.75V may be used. Under these conditions a maximum peak anode voltage of 1.5kV is permissible.

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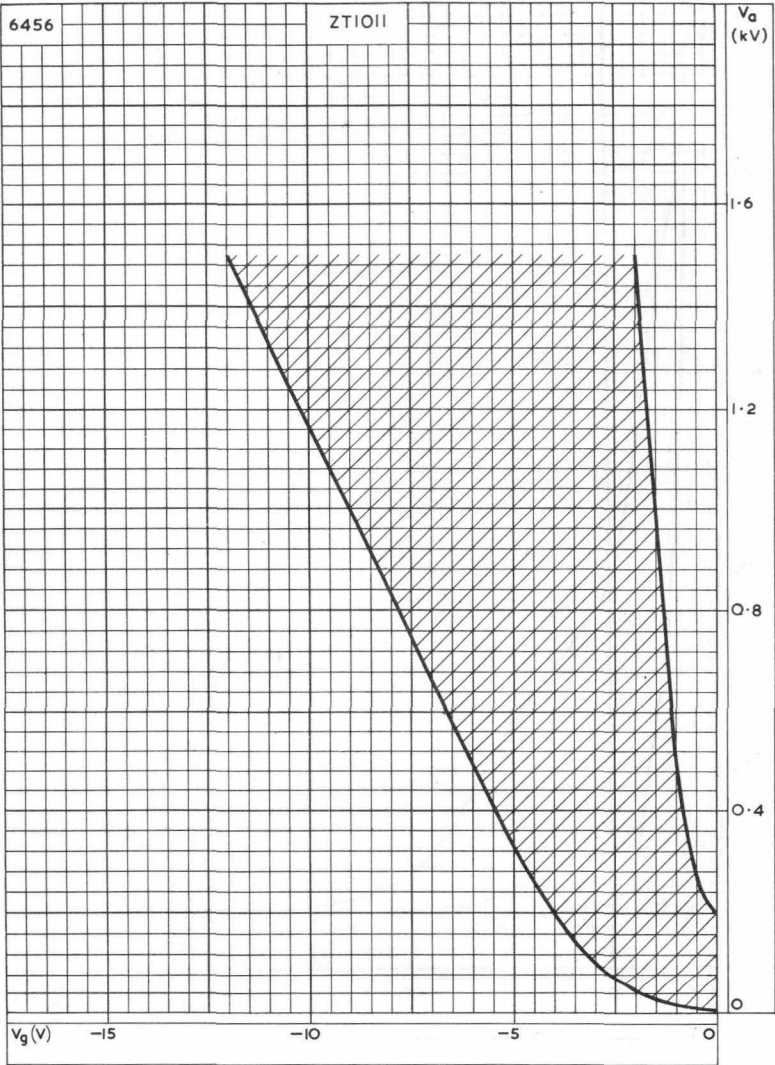
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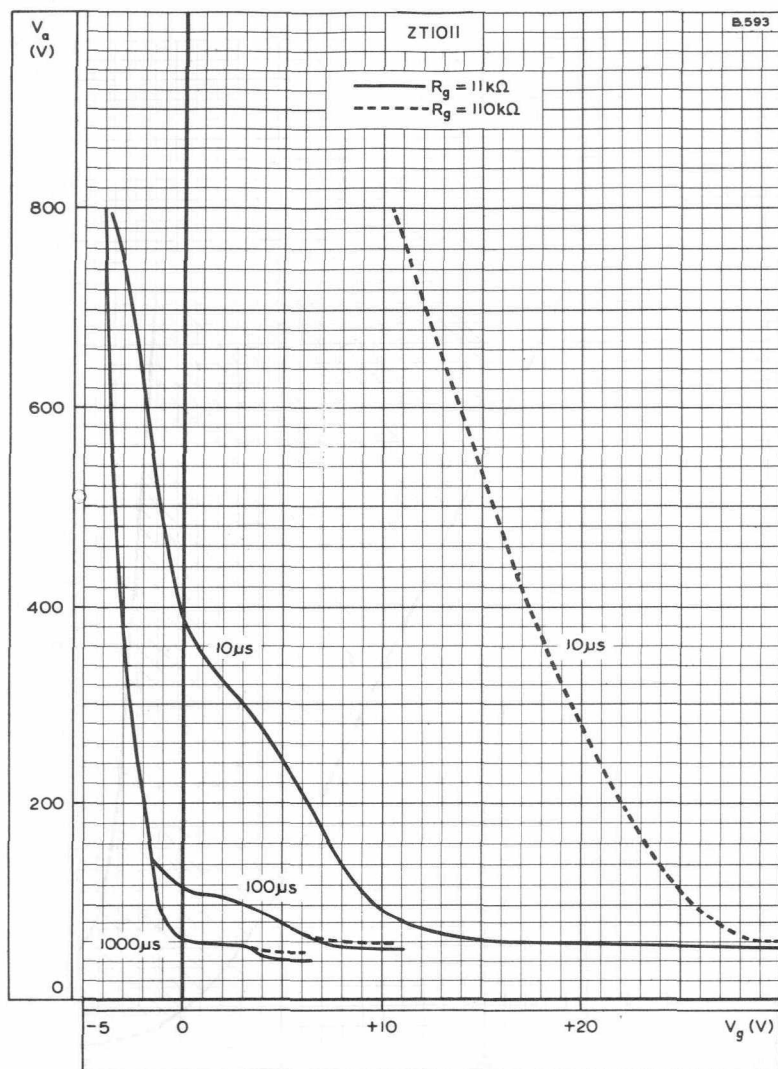
CONTROL CHARACTERISTIC



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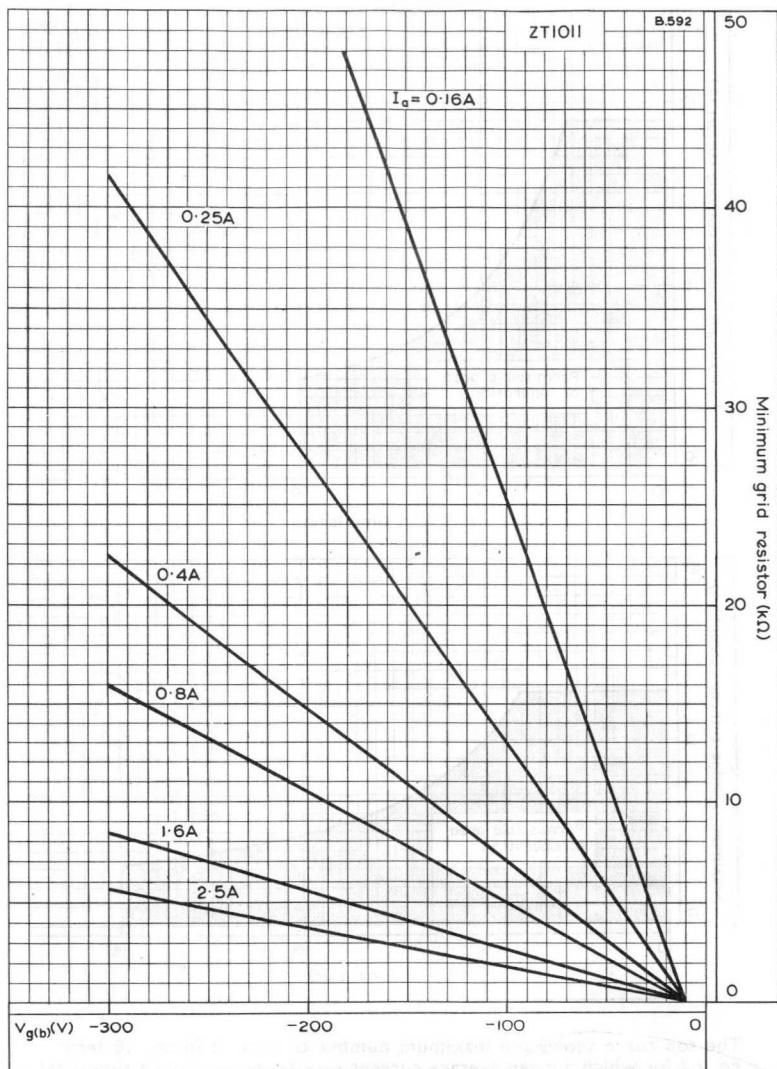
NOMINAL VARIATION BETWEEN ANODE AND GRID VOLTAGES FOR
DIFFERENT IGNITION DELAY TIMES



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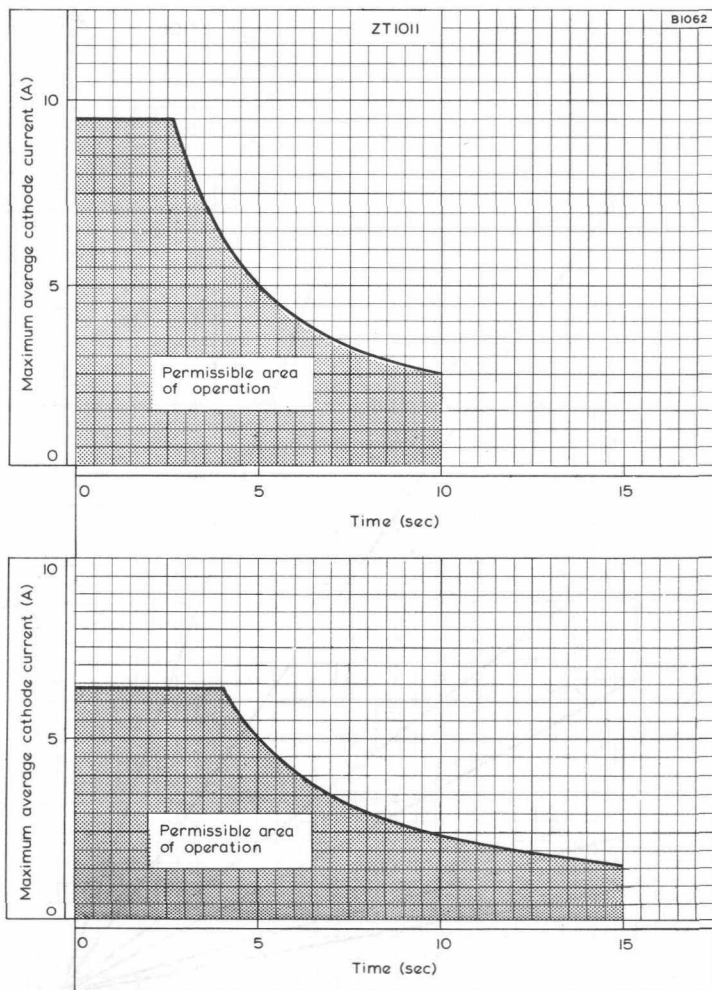
MINIMUM GRID RESISTANCE PLOTTED AGAINST NEGATIVE SUPPLY VOLTAGE WITH ANODE CURRENT AS PARAMETER



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The top curve shows the maximum number of seconds in any 10 second period for which a given average current may be drawn from a sinusoidal supply if the peak voltage applied to the valve is less than 1.25kV. The bottom curve shows the maximum number of seconds in any 15 second period for which a given average current may be drawn from a sinusoidal supply if the applied peak voltage lies between 1.25 and 1.5kV.

