TRIODE THYRATRON

Triode mercury vapour thyratron with negative control characteristic. Primarily designed for motor control and other industrial applications.

XG1-2500

This data should be read in conjunction with DEFINITIONS AND OPERATIONAL RECOMMENDATIONS—THYRATRONS, preceding this section of the handbook.

LIMITING VALUES (absolute ratings, not design centre)

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

Max. peak anode voltage			
*Inverse	1.5	1.0	kV
Forward	1.0	1.0	kV
*Condensed mercury temperature limits	40 to 75	40 to 80°	C
Max. cathode current			
Peak (25 c/s and above)		15	A
Peak (below 25c/s)		5.0	A
Peak (ignitor firing service)		40	A
Average (max. averaging time 15s)		2.5	A
Average (ignitor firing service)		1.0	A
Surge (fault protection max. duration 0.1s)		200	A
Max. negative control-grid voltage			
Before conduction		500	V
During conduction		10	V
Max. average positive control-grid current for anode voltage more positive than −10V (averaging time, 15s)		250	mA
Max. peak positive control-grid current during the time that the anode voltage is more positive than −10V		1.0	A
Max. peak positive control-grid current during the time that the anode voltage is more negative than −10V		100	mA
Max. control-grid resistor (Recommended min. control-grid resistor 10kΩ)		100	kΩ
Heater voltage limits		4.5 to 5.5	V
Min. valve heating time (See heating and cooling characteristics on pages 2 and 6)			
Max. power supply frequency		150	c/s

*Max. condensed mercury temperature rating for intermediate anode voltages may be determined by linear interpolation.

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CHARACTERISTICS

Electrical

Heater voltage	5.0	V
Heater current at 5.0V		
Average	4.5	A
Maximum	4.8	A
Anode to control-grid capacitance	4.0	pF
Control-grid to cathode capacitance	8.0	pF
Recovery (deionisation) time approx.	1,000	μs
Ionisation time (approx.)	10	μs
Anode voltage drop	16	V
Critical grid current at $V_a = 1.0$ kV	<20	μA

Mechanical

Type of cooling	Convection	
Equilibrium condensed mercury temperature rise above ambient		
At full load (approx.)	42	°C
At no load (approx.)	33	°C
Mounting position	Vertical, base down	
Max. net weight	6.0	oz.
	170	g

HEATING-UP TIME

The preferred minimum value of the valve heating-up time can be obtained from the heating and cooling curve on page 6. This shows how the condensed mercury temperature rises above the ambient temperature from the instant of switching on the heater supply.

Under normal conditions, however, cathode current may be drawn when the condensed mercury temperature is within approximately 7°C of the minimum quoted value. (See appropriate section of 'General Operational Recommendations—Thyratrons'.) The total heating-up time under this duty can be obtained from the curve on page 7.

Minimum cathode heating time	5.0	min

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Control characteristic (see page 4)

The shaded area between the curves indicates the spread in characteristics due to:

(*a*) Initial differences between individual valves.

(*b*) Variations in characteristics during life.

(*c*) Variations in characteristics due to changes in heater voltage.

(*d*) The effects of circuit loading.

The effects of different values of series grid resistor have been ignored.

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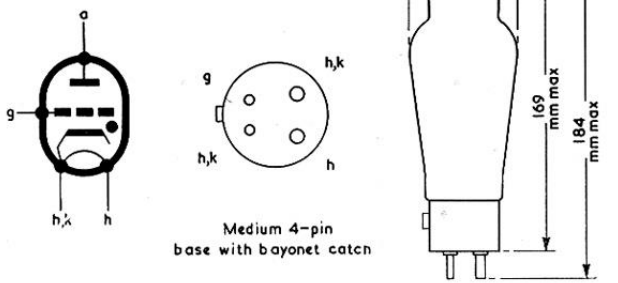

Medium 4-pin
base with bayonet catch

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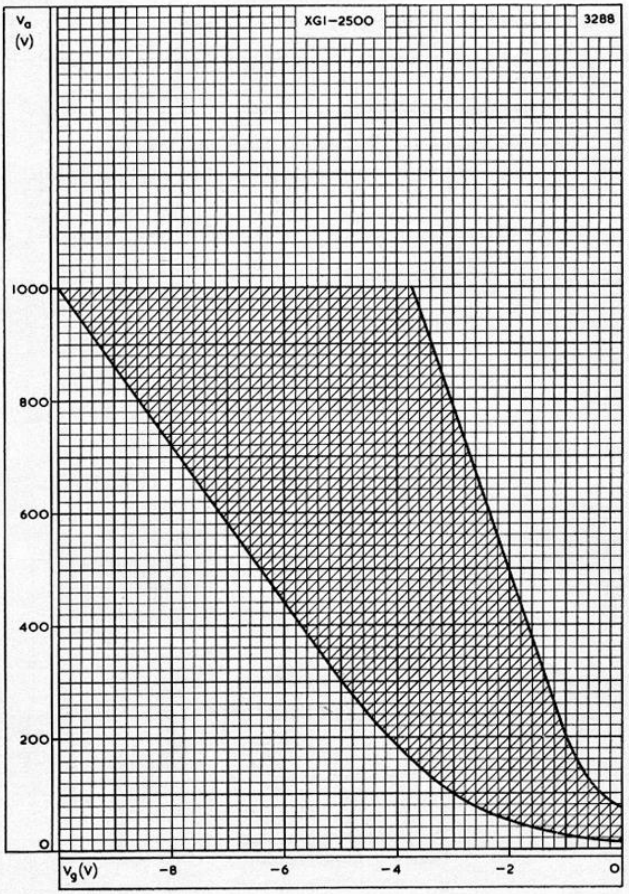

CONTROL CHARACTERISTIC
(See note on page 3)

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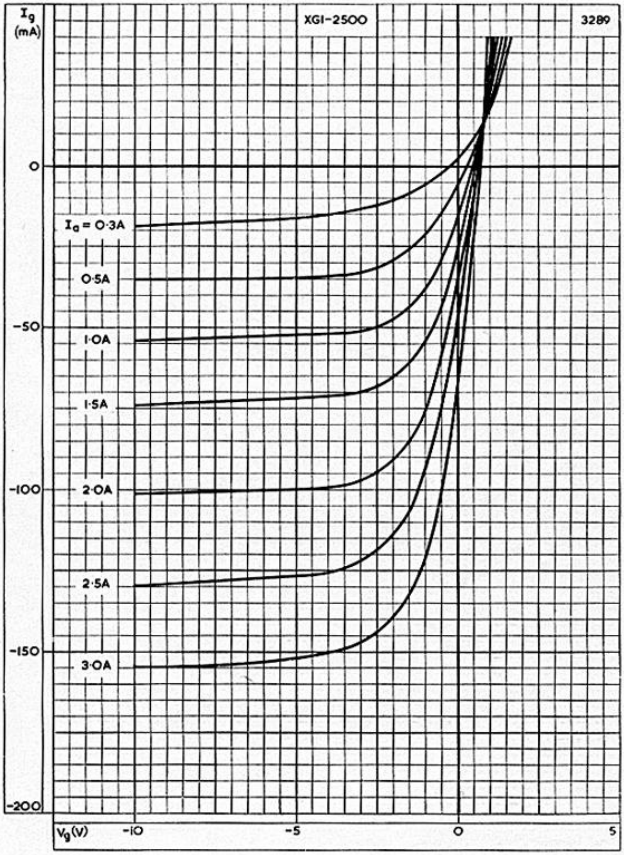

GRID ION CURRENT CHARACTERISTIC

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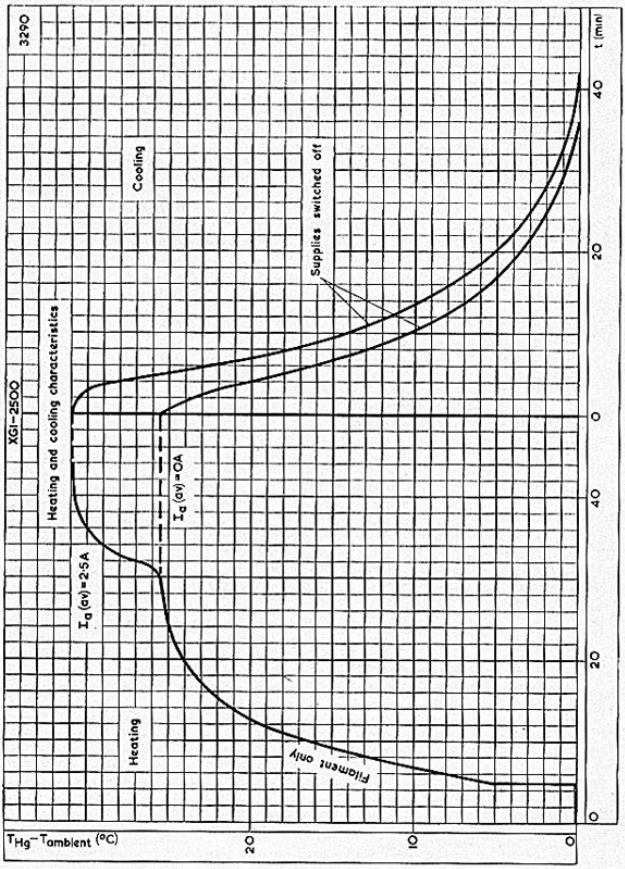

HEATING AND COOLING CHARACTERISTIC. EXCESS TEMPERATURE OVER AMBIENT PLOTTED AGAINST TIME

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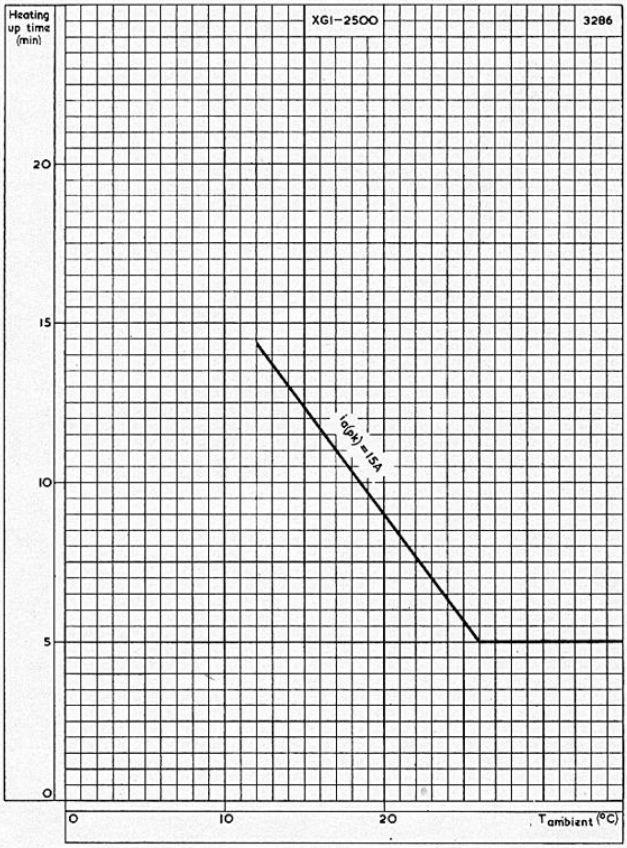

TOTAL HEATING-UP TIME PLOTTED AGAINST AMBIENT TEMPERATURE