TRIODE THYRATRON

Triode mercury vapour thyratron with negative/positive control characteristics.

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This data should be read in conjunction with DEFINITIONS AND GENERAL 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 account in arriving at the actual valve operating conditions.

Continuous duty

Max. peak anode voltage				
Inverse			2.5	kV
Forward			1.5	kV
Max. cathode current				
Peak	80	100	*160	A
Average	12.5	10	*20	A
†R.M.S.	30	30	*50	A
(At max. averaging time)	15	15	(1 cycle)	s
Surge (fault protection max. duration 0.1s)	1500	1500	1500	A
Condensed mercury temperature limits	35 to 75	35 to 75	40 to 75	°C

Recommended condensed mercury temperature 60°C during operation.

Max. negative grid voltage		
Before conduction	–300	V
During conduction	–10	V
Max. average positive grid current (Anode voltage more positive than –10V)	250	mA
Max. peak positive grid current (Anode voltage more positive than –10V)	1.0	A
Max. peak positive grid current (Anode voltage more negative than –10V)	100	mA
Max. grid resistor	50	kΩ
(Recommended value)	10	kΩ

*Permissible overload for max. duration of 5s once in any 5min operating period.

†Under delayed firing conditions.

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Additional data for a.c. and welder operation (two valves in inverse parallel, firing over complete cycle)

Max. peak anode voltage				
Forward			750	V
Inverse			750	V
Duty cycle	10	50	100	%
Max. cathode current				
Peak (per valve)	156	78	39	A
Average (per valve)	5.0	12.5	12.5	A
R.M.S. (total)	110	55	27.5	A
Max. averaging time	5.0	5.0	15	s
Condensed mercury temperature range			40 to 80	°C

HEATING UP TIME

The preferred minimum value of the total valve heating up time can be obtained from the heating and cooling curve on page 5. 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 approximately within 7°C of the minimum quoted value. (See page 6 and also appropriate section of 'General operational recommendations—thyratrons'.)

During long shut down periods, i.e. overnight, the heater supply may be lowered to 60 to 80% of normal instead of being switched off. This greatly reduces the minimum delay required after restoring the heater supply to normal. The total heating up time under this duty can be obtained from the curve on page 6.

Minimum cathode heating time	5.0	min

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CHARACTERISTICS

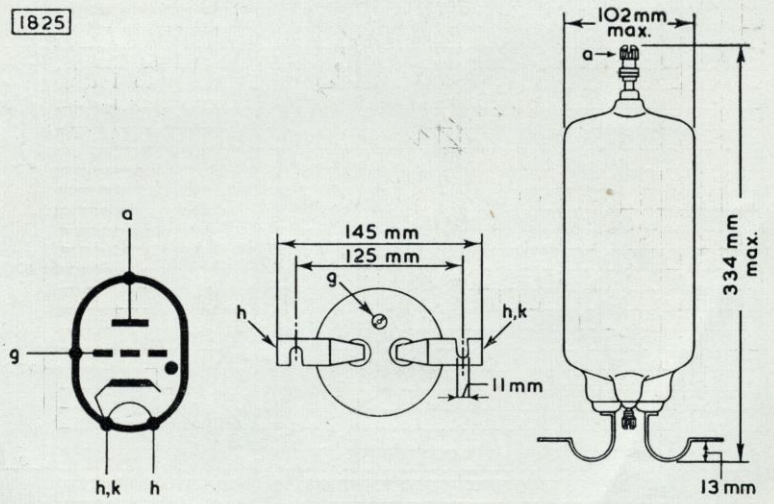
Electrical

Heater voltage	5.0	V
Heater current at 5.0V		
Average	14	A
Deionisation time (approx.)	1000	µs
Ionisation time (approx.)	10	µs
Anode voltage drop	10	V
Max. operating frequency	150	c/s
Anode-to-grid capacitance	15	pF
Grid-to-cathode capacitance	60	pF

Mechanical

Type of cooling	Convection
Max. net weight	1.6 kg / 3.5 lb
Mounting position	Vertical, base down.

The valve should only be secured by the heater lugs and the anode connector should be flexible.



The h,k terminal is marked with a red dot.

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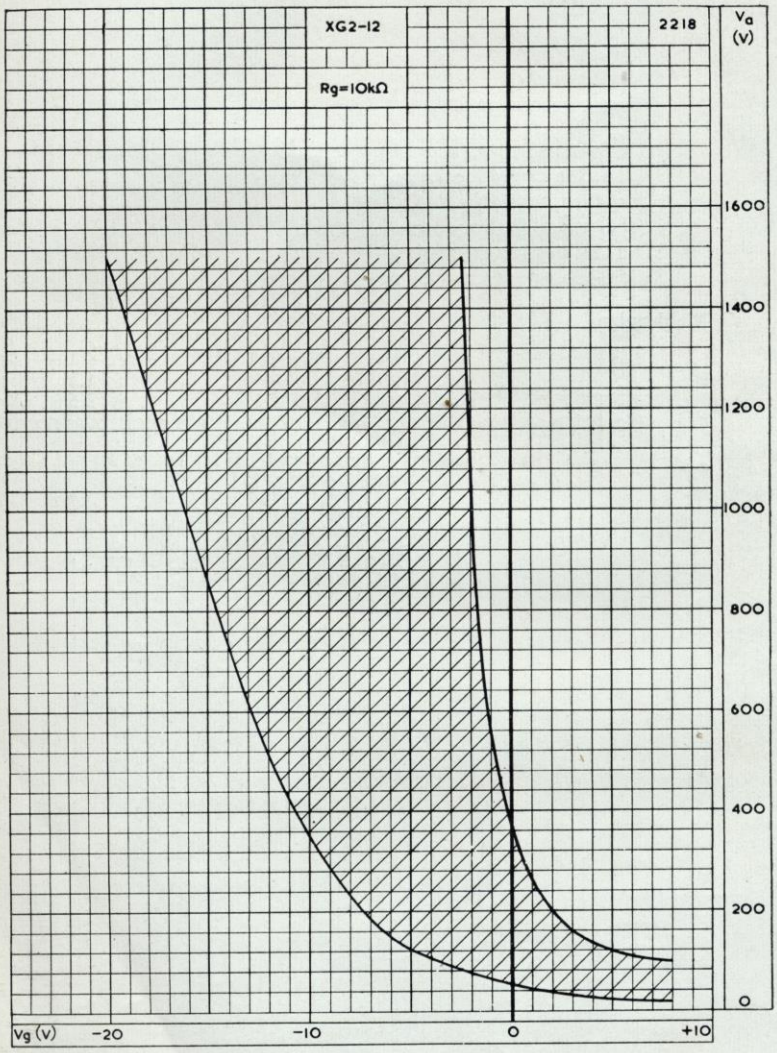

CONTROL CHARACTERISTIC

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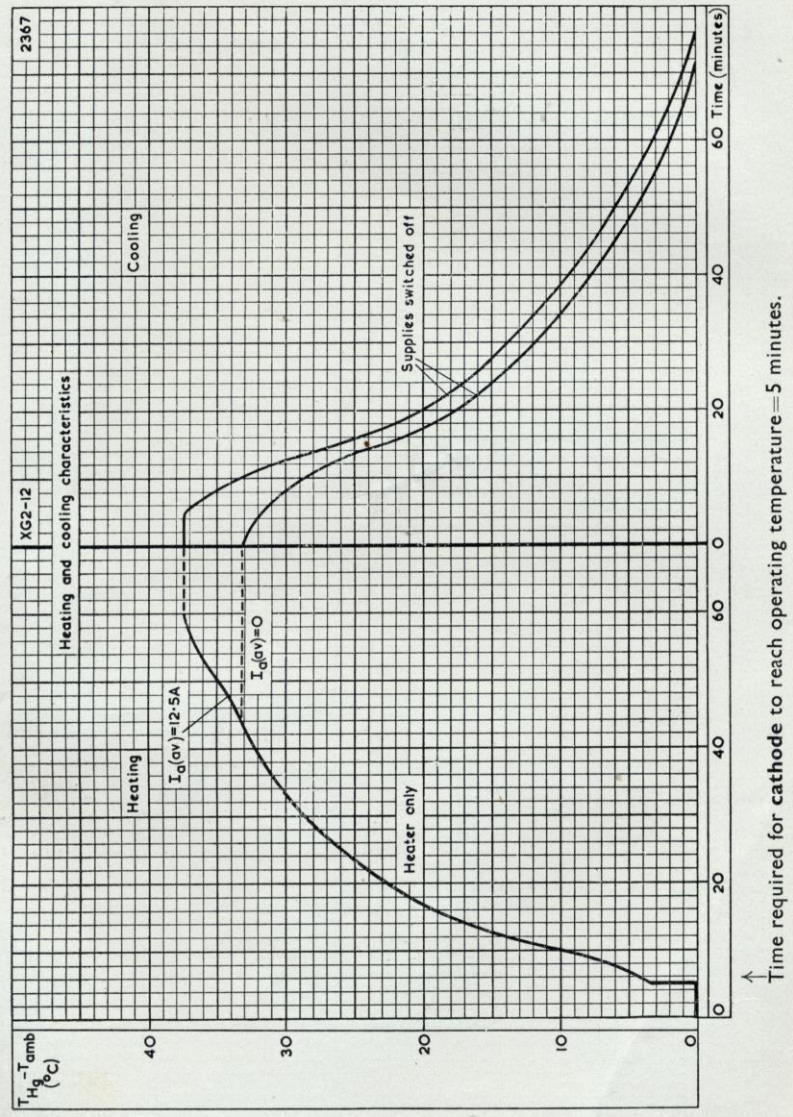

HEATING AND COOLING CHARACTERISTIC. EXCESS TEMPERATURE OVER AMBIENT PLOTTED AGAINST TIME

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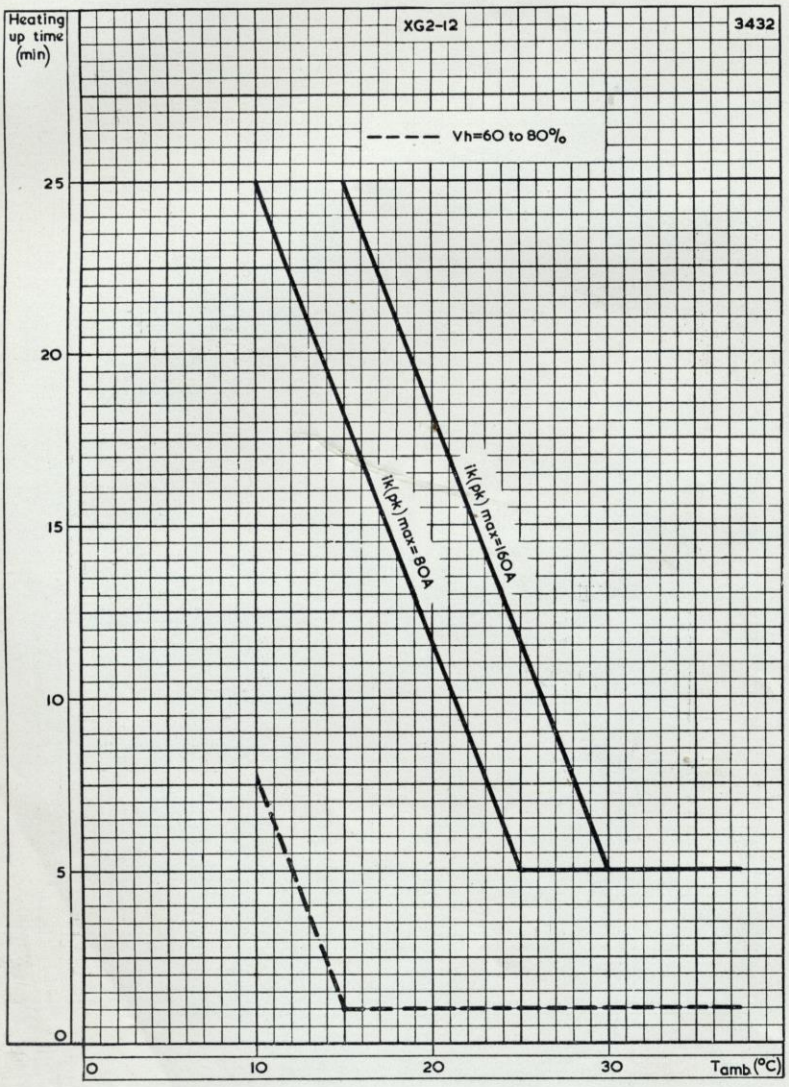

TOTAL HEATING UP TIME PLOTTED AGAINST AMBIENT TEMPERATURE