

The data to be read in conjunction with the Hydrogen Thyatron Preamble.

## ABRIDGED DATA

Hydrogen-filled triode thyatron, positive grid, for pulse operation. A hydrogen reservoir is incorporated.

Peak forward anode voltage	-	18 kV max
Peak anode current	-	325 A max
Average anode current	-	500 mA max
Anode heating factor	-	$3.9 \times 10^9$ VApps max
Peak output power	-	2.6 MW max

## GENERAL DATA

### Electrical

Cathode (connected internally to one end of the heater)	-	Oxide coated
Heater voltage:	-	
Recommended limits		$6.3 \pm 5\%$ V
Maximum limits		$6.3 \pm 7.5\%$ V
Heater current	-	10.6 A
Tube heating time (minimum)	-	3.0 min

### Mechanical

Overall length	-	211.0 mm (8.307 inches) max
Overall diameter	-	65.1 mm (2.563 inches) max
Net weight	-	300 g (10.6 ounces) approx.
Mounting position	-	any
Tube connections	-	B4D
Top cap	-	BS448-CT3
Top cap connector	-	MA359
<b>Cooling</b>	-	natural



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e2v technologies (uk) limited, Waterhouse Lane, Chelmsford, Essex CM1 2QU United Kingdom Holding Company: e2v technologies plc

Telephone: +44 (0)1245 493493 Facsimile: +44 (0)1245 492492

Contact e2v by e-mail: [enquiries@e2v.com](mailto:enquiries@e2v.com) or visit [www.e2v.com](http://www.e2v.com) for global sales and operations centres.

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## PULSE MODULATOR SERVICE

### MAXIMUM AND MINIMUM RATINGS (Absolute values)

Anode	Min	Max	
Peak forward anode voltage (see note 1)	.	-	18 kV
Peak inverse anode voltage (see note 2)	.	-	18 kV
Peak anode current	.	-	325 A
Average anode current	.	-	500 mA
Rate of rise of anode current (see note 3)	.	-	1500 A/ $\mu$ s
Anode heating factor	.	-	$3.9 \times 10^9$ VApps

Grid	Min	Max	
Unloaded grid drive pulse voltage (see note 4)	.	200	- V
Grid pulse duration	.	2.0	- $\mu$ s
Rate of rise of grid pulse (see note 3)	.	180	- V/ $\mu$ s
Peak inverse grid voltage	.	-	200 V
Loaded grid bias voltage	.	0	-120 V
Forward impedance of grid drive circuit	.	-	500 $\Omega$

Cathode	Min	Max	
Heater voltage:			
Recommended limits	.	$6.3 \pm 5\%$	V
Maximum limits	.	$6.3 \pm 7.5\%$	V
Tube heating time	.	3.0	- min

Environmental	Min	Max	
Environmental performance	.		See note 5
Ambient temperature	.	-50	+90 $^{\circ}$ C
Altitude	.	-	3 km
	.	-	10,000 ft

## CHARACTERISTICS

Anode	Min	Typ	Max	
Critical DC anode voltage for conduction (see note 6)	.	-	0.3	1.0 kV
Anode delay time (see notes 6 and 7)	.	-	0.3	0.65 $\mu$ s
Anode delay time drift (see notes 6 and 8)	.	-	0.05	0.1 $\mu$ s
Jitter time (see notes 6 and 9)	.	-	-	15.0 ns
Recovery time	.			see graph
Heater current (at 6.3V)	.	9.6	10.6	11.6 A

## NOTES

1. This is the maximum forward hold-off voltage imposed on the thyratron in a pulse modulator circuit. Tubes are tested at 18 kV peak forward anode voltage, with the charging reactor inductance and pulse forming network capacitance resonant at 1000 pps. For instantaneous starting applications the maximum permissible peak forward voltage is 16 kV; this must not be reached in less than 0.04 s and there must be no overshoot.
2. In pulsed operation the peak inverse anode voltage, exclusive of a spike of 0.05 ms duration, must not exceed 5.0 kV during the first 25  $\mu$ s after the pulse.
3. This rate of rise refers to that part of the leading edge of the pulse between 25% and 75% of the pulse amplitude.
4. Measured with respect to cathode potential.
5. Original samples of this tube type have been successfully tested to transportation tests specified in BS EN 60068-2-64 test Fh and BS EN 60721-3-2 part 3, section 2.
6. The typical figures are obtained on test using conditions of minimum grid drive. Improved performance can be expected by increasing the grid drive.
7. The time interval between a point on the leading edge of the unloaded grid pulse at 25% of the pulse amplitude and the point where anode conduction takes place.
8. Normally taken as the drift in delay time over a 5-minute run at full ratings between the second and seventh minutes of operation.

9. The variation of firing time measured at 50% of current pulse amplitude.

## HEALTH AND SAFETY HAZARDS

e2v technologies thyratrons are safe to handle and operate, provided that the relevant precautions stated herein are observed. e2v technologies does not accept responsibility for damage or injury resulting from the use of electronic devices it produces. Equipment manufacturers and users must ensure that adequate precautions are taken. Appropriate warning labels and notices must be provided on equipment incorporating e2v technologies devices and in operating manuals.

### High Voltage

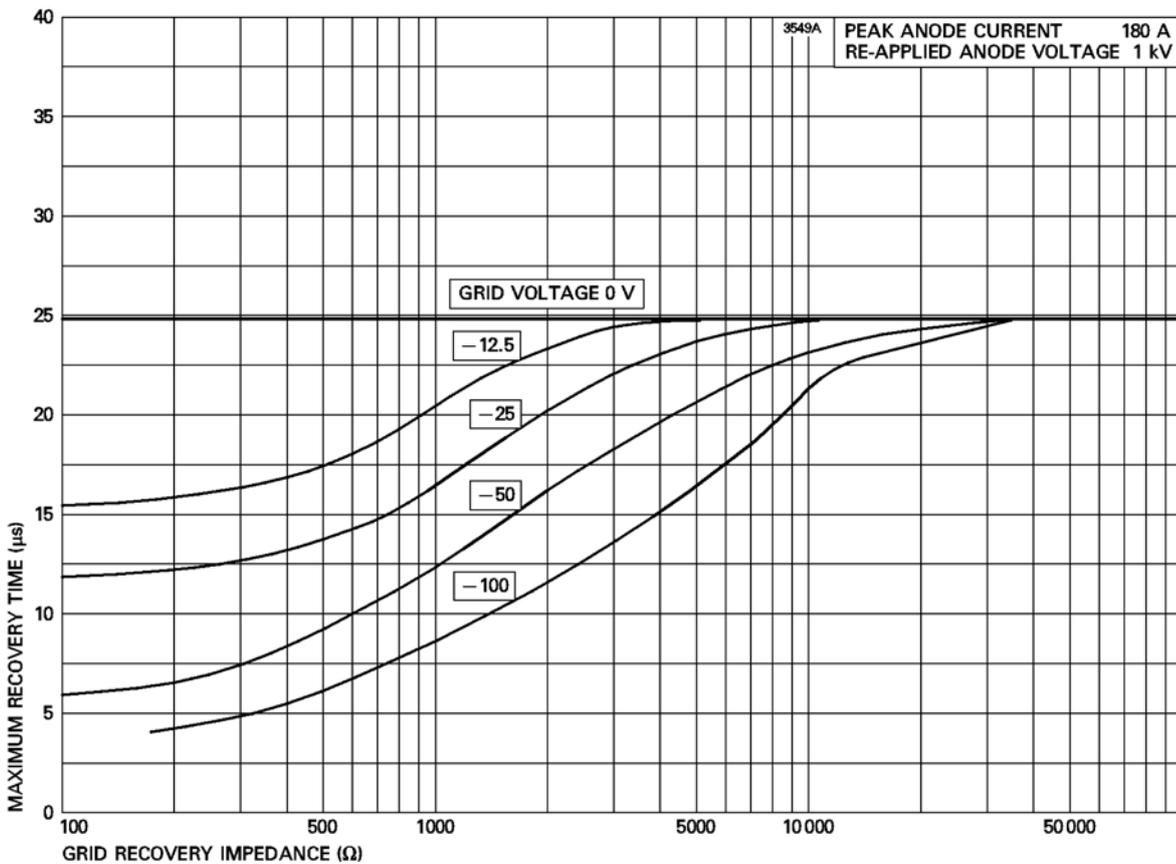
Equipment must be designed so that personnel cannot come into contact with high voltage circuits. All high voltage circuits and terminals must be enclosed and fail-safe interlock switches must be fitted to disconnect the

primary power supply and discharge all high voltage capacitors and other stored charges before allowing access. Interlock switches must not be bypassed to allow operation with access door open.

### X-Ray Radiation

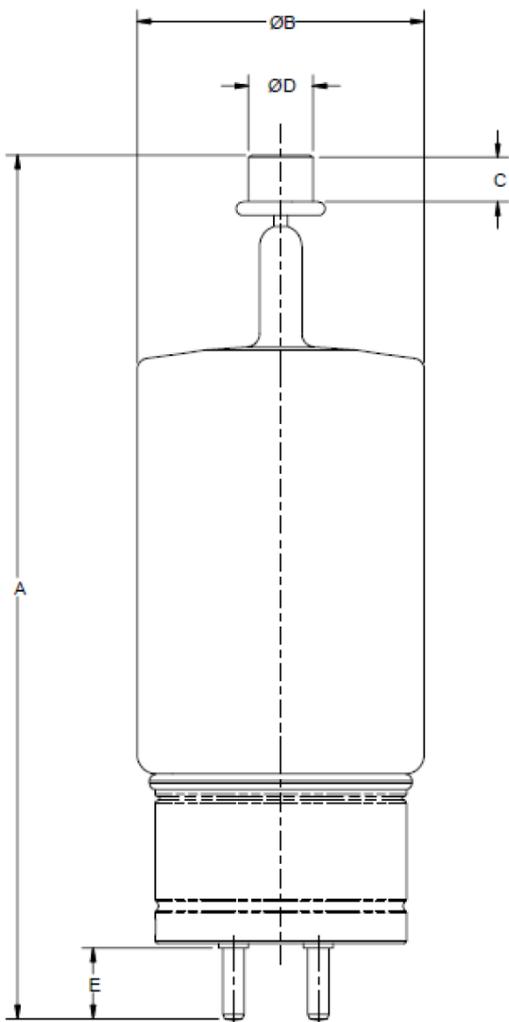
All high voltage devices produce X-rays during operation and may require shielding. The X-ray radiation from hydrogen thyratrons is usually reduced to a safe level by enclosing the equipment or shielding the thyatron with at least 1.6 mm (1/16 inch) thick steel panels. Users and equipment manufacturers must check the radiation level under their maximum operating conditions.

## MAXIMUM RECOVERY CHARACTERISTICS



# OUTLINE

(All dimensions without limits are nominal)



Ref	Millimetres	Inches
A	201.0 ± 10.0	7.913 ± 0.394
B	65.10 max	2.563 max
C	9.53 min	0.375 min
D	14.38 ± 0.18	0.566 ± 0.007
E	15.88	0.625
F	4.75 ± 0.08	0.187 ± 0.003
G	25.40	1.000
H	14.27	0.562
J	19.05	0.750

Inch dimensions have been derived from millimetres.

Pin	Element
1	Grid
2	Heater-cathode
3	Heater
4	Cathode
Top Cap	Anode

