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**Data Sheet**  
**PLUMBICON IMAGING TUBE: XQ1285**  
May 2004

**Camera Tube: XQ1285**

Vidicon TV camera tube with 25.4 mm (1 inch) diameter, low heater power consumption, magnetic focusing and deflection, provided with a precision electronic gun as in the 1 in diameter Plumbicon tubes of the XQ1070 series. The XQ1285 has a fiber optic faceplate for use in medical or industrial X-ray equipment where it is directly coupled to an X-ray image intensifier with a P11 or P20 phosphor on a fiber optic output window. For this purpose it is provided with a special photoconductive layer with a high sensitivity in the 450 to 500nm spectral range and medium lag for proper X-ray noise integration.

**QUICK REFERENCE DATA**

Faceplate (separate mesh)	Fiber-Optic	
Focusing	Magnetic	
Deflection	Magnetic	
Diameter	25.4 mm 1.0 inch	
Length (approx.)	159 mm	
Heater requirements	6.3 V 95 mA	
Spectral response (approx. max/cut-off)	475/800 nm	
Resolution	>50 lp/mm	

**Camera Tube: XQ1285**
**OPTICAL DATA**


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Dimensions of quality area on photoconductive target circle (diameter)	15.8 mm	[1]
Photoconductive Layer	Type B	
Spectral Response (approx. max/cut-off)	475/800 nm	
Center to center spacing of fibers at faceplate	7.5 $\mu$ m	
Faceplate flatness	1.0 $\mu$ m	
Faceplate Numerical Aperture	1.0	

For correct orientation of the image on the target the direction of the horizontal scan should be parallel to the plane defined by pin 1 and the longitudinal axis of the tube.

**ACCESSORIES**


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Socket	Type 56602 (or equivalent)	
Deflection and focusing coil unit	Type AT11202/01 or AT1116S (or equivalent)	

**ELECTRICAL DATA**


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**Camera Tube: XQ1285**

Deflection		Magnetic	
Focusing		Magnetic	
Heating		Indirect by a.c. or d.c.	
Heater Voltage	$V_f$	6.3 ( $\pm 5\%$ ) V	
Heater Current (nominal at $V_f = 6.3V$ )	$I_f$	95 mA	[2]
Capacitance: signal electrode to all	$C_{as}$	3 – 5 pF	[3]

**LIMITING VALUES (Absolute maximum rating system)**


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All voltages are referred to the cathode, unless otherwise stated.

Signal electrode voltage (max)	$V_{as}$	100 V	
Grid 4 voltage (max)	$V_{g4}$	1100 V	
Grid 3 voltage (max)	$V_{g3}$	800 V	
Voltage between grid 4 and grid 3 (max)	$V_{g4/g3}$	450 V	
Grid 2 voltage (max)	$V_{g2}$	350 V	
Grid 1 voltage, positive (max)	$V_{g1}$	0 V	
Grid 1 voltage, negative (max)	$-V_{g1}$	125 V	
Cathode to heater voltage, positive peak (max)	$V_{kfp}$	125 V	

**Camera Tube: XQ1285**

Cathode to heater voltage, negative peak (max)	$-V_{kfp}$	50 V	
External resistance between cathode and heater, at $V_{kfp} > 10$ V (min)	$R_{kf}$	2 k $\Omega$	
Dark Current (peak, max)	$I_{darkp}$	0.1 $\mu$ A	
Output Current (peak, max)	$I_{asp}$	0.6 $\mu$ A	
Faceplate temperature, storage and operation (max/min)	T	80/-30 $^{\circ}$ C	
Faceplate illumination (max)	E	5000 lx	

**OPERATING CONDITIONS**

For a target area of 15mm diameter; faceplate temperature  $30 \pm 2^{\circ}$ C. All voltages are referred to the cathode unless otherwise stated.

Grid 1 (control grid) voltage	$V_{g1}$	Adjusted for sufficient beam current to stabilize a peak output current, $I_{asp}$ , of 600nA	[ ]
Grid 2 (accelerator) voltage	$V_{g2}$	300 V	
Grid 3 (collector) voltage (normal/high res. operation)	$V_{g3}$	375/600	
Grid 4 (mesh) voltage (normal/high res. operation)	$V_{g4}$	600/960 V	[4]

**Camera Tube: XQ1285**

Peak Signal current	$I_{sp}$	150 nA	[5]
Peak Dark Current	$I_{darkp}$	20 nA	
Blanking voltage (peak to peak): when applied to grid 1	$V_{g1\ p-p}$	50 V	
Blanking voltage (peak to peak): when applied to cathode	$V_{kp-p}$	50 V	
Field strength at center of focusing coil (nominal), (normal/high res. operation)	H	3200/4800 A/m	[6]
Field strength of adjustable alignment coils	H	0 – 320 A/m	

**Electron Gun Characteristics**

Grid 1 voltage for cut-off at $V_{g2} = 300V$ without blanking	$V_{g1}$	-30 – -100 V	
Blanking voltage on grid 1 (peak to peak)	$V_{g1\ p-p}$	$50 \pm 10$ V	
Blanking voltage on cathode (peak to peak)	$V_{k\ p-p}$	20 V	
Grid 2 current at normally required beam currents (max)	$I_{g2}$	0.5 mA	

**Performance**

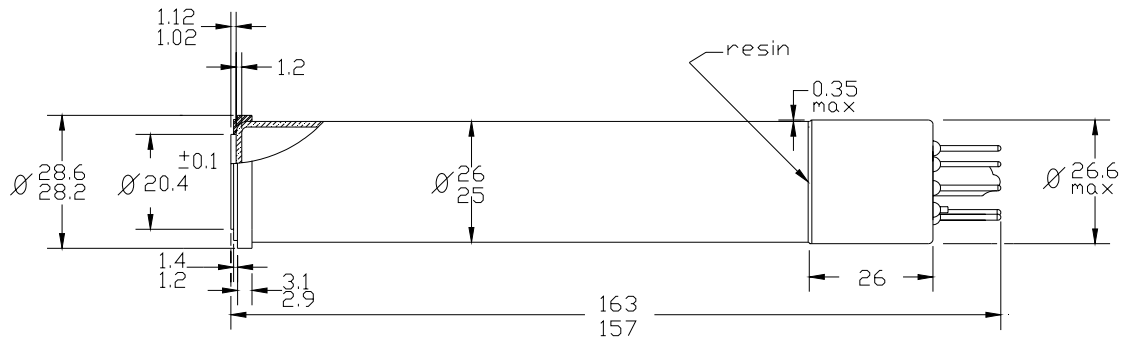
Signal electrode voltage for a peak dark current of 20nA (min/typ/max)	$V_{as}$	30/40/75 V	[7]
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**Camera Tube: XQ1285**

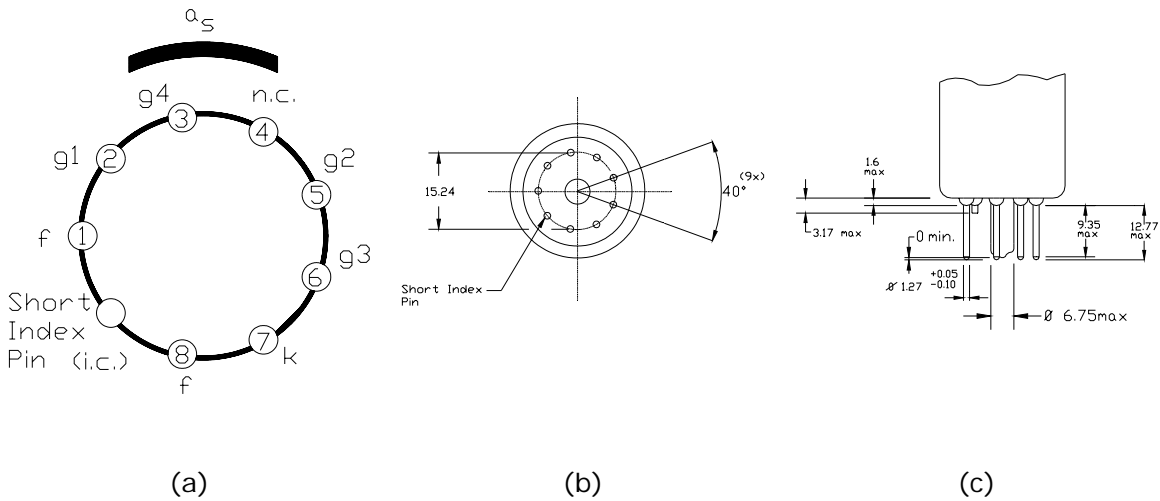
Grid 1 voltage for picture cutoff with no blanking applied (min/typ/max)	$V_{g1}$	-30/-55/-100 V	
Sensitivity: Illumination required for a peak signal current of 150nA with P20 (typ/max)	E	1.5/3.0 lx $3/6 \times 10^{-7} \text{ W/cm}^2$	
Sensitivity: Illumination required for a peak signal current of 150nA with P11	E	0.3/0.6 $2.3/4.5 \times 10^{-7} \text{ W/cm}^2$	
Decay Lag: Residual signal after dark pulse of 200 ms (max/typ)		15/20 %	[8]
Limiting resolution at picture center (normal/high res. operation), (min)		50/60 lp/mm	[9]
Average gamma of transfer characteristic for signal currents 10 – 300nA	$\gamma$	0.7	[10]
Blemishes			[11]

**MECHANICAL DATA**

Mounting Position	Any	
Mass (approx)	60 g	
Base	IEC 67-1-33a (JEDEC E8-11)	
Dimensions	See figures 1 and 2	

**Camera Tube: XQ1285**
**FIGURES**


**Figure 1.** Mechanical data for XQ1285 camera tube



**Figure 2.** Mechanical data for XQ1285 camera tube

**NOTES**

- [1] (a) The circular quality area of 15.8 mm diameter is concentric with the faceplate.

**Camera Tube: XQ1285**

- (b) The scanning amplitudes are so adjusted that a target area of about 15 mm diameter is displayed on a standard monitor as a circular area with a diameter equal to the raster height. (15mm x 20mm scan).
  - (c) The displayed circular area of approximately 15 mm diameter should fall within the quality area of 15.8 diameter but is generally not concentric with the latter due to eccentricities of the output window of the image intensifier and of the optical system.
  - (d) Under scanning of the chosen target area, or failure of scanning, should be avoided, so as not to cause damage to the photoconductive layer.
- [2] The heater voltage must not exceed 9.5V r.m.s. For optimum performance stabilization of the heater voltage is recommended.
- [3] This capacitance, which is effectively the output impedance, increases when the tube is inserted in the coil unit.
- [4] The optimal grid 4 voltage, for best uniformity of black and white level, depend on the type of coil unit used and will be 1.5 to 1.6 times  $V_{g3}$  for the coil units mentioned under ACCESSORIES. Under no circumstances should grid 4 (mesh) be allowed to operate at a voltage level below that of grid 3, as this may damage the target.
- [5] Signal current is output current minus dark current.
- [6] Focus current adjusted for optimal electrical focus. The polarity of the focusing coil should be such that its image end attracts an external north-seeking pole.

Camera Tube: XQ1285

- [7] The dark current is measured on a waveform oscilloscope and is dependent on the signal electrode voltage and the temperature.
- [8] Measured with a 100% peak signal current of 150nA
- [9] Obtained with a vide amplifier system with adequate bandwidth. Measured with a transparent square-wave test pattern applied directly to the faceplate and illuminated with P20 light with lambertain distribution. The average transmission of the test transparency is about 50% of the transmission of the transparency's whites. No aperture correction or gamma correction is applied.
- [10] For typical transfer characteristics with P20 and P11 light input.
- [11] For details of test procedures for determining blemishes, see Narragansett Imaging document PLUMBICON IMAGING TUBES: TEST SPECIFICATION.