

## CAMERA TUBE

Vidicon television camera tube with low heater consumption, separate mesh construction, magnetic focusing, magnetic deflection and 25.4 mm (1 in) diameter intended for use in black-and-white and colour television cameras in industrial, medical and broadcast applications.

### QUICK REFERENCE DATA

Separate mesh	
Focusing	magnetic
Deflection	magnetic
Diameter	25.4 mm (1 in)
Length	159 mm (6 $\frac{1}{4}$ in)
Heater	6.3 V, 95 mA
Resolution	≥ 1000 TV lines

The electrical and mechanical properties of the two types are essentially identical, the differences being found in the degree of freedom from blemishes of the photoconductive layers, in the sensitivity and the signal electrode voltage range.

XQ1240 - intended for use in industrial, medical and broadcast applications in which a high standard of performance is required.

XQ1241 - general purpose tube for less critical industrial applications, experiments, amateur use etc.

### OPTICAL

Diagonal of quality rectangle on photoconductive layer (aspect ratio 3 : 4) max. 16 mm

Orientation of image on photoconductive layer:

The direction of the horizontal scan should be essentially parallel to the plane defined by the short index pin and the longitudinal axis of the tube.

Photoconductive layer type A  
Spectral response, max. response at approx. 550 nm

### HEATING

Indirect by A.C. or D.C.; parallel and series supply

Heater voltage	$V_f$	6.3 V ± 10%
Heater current	$I_f$	95 mA

When the tube is used in a series heater chain, the heater voltage must not exceed 9.5 V<sub>rms</sub> when the supply is switched on.



**XQ1240**  
**XQ1241**

**CAPACITANCES**

Signal electrode to all

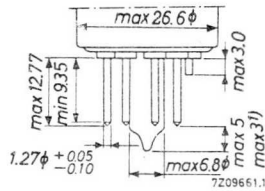
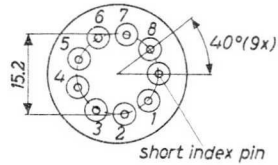
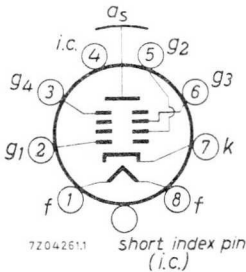
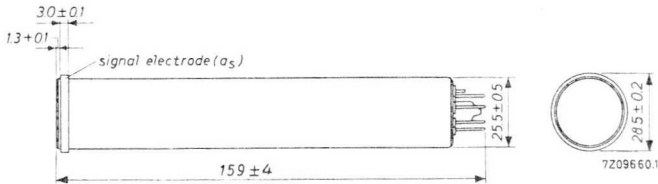
$C_{as}$  4.5 pF

This capacitance, which effectively is the output impedance of the tube, increases when the tube is inserted into the deflection and focusing coil unit.

**MECHANICAL DATA**

Dimensions in mm

Base: JEDEC no. E8-11 except for pumping stem  
IEC 67-I-33a



Mounting position: any

Net mass

approx.

55 g

**ACCESSORIES**

→ Socket

type 56098 or equivalent

Deflection and focusing coil unit

AT1102/01, AT1103 or equivalent

**DEFLECTION** magnetic

**FOCUSSING** magnetic

**LIMITING VALUES** (Absolute max. rating system)  
for scanned area of 9.6 mm x 12.8 mm (3/8 in x 1/2 in)

"Full-size scanning", i. e. scanning of a 9.6 mm x 12.8 mm area of the photoconductive layer should always be applied. Underscanning, i. e. scanning of an area less than 9.6 mm x 12.8 mm, may cause permanent damage to the specified full-size area.

Signal-electrode voltage	$V_{as}$	max.	100	V
Grid no. 4 voltage	$V_{g4}$	max.	1000	V
Grid no. 3 voltage	$V_{g3}$	max.	850	V
Grid no. 2 voltage	$V_{g2}$	max.	450	V
Grid no. 1 voltage, negative positive	$-V_{g1}$	max.	125	V
	$V_{g1}$	max.	0	V
Cathode-to-heater voltage, peak positive negative	$V_{kf,p}$	max.	125	V
	$-V_{kf,p}$	max.	10	V
Dark current, peak	$I_{dark,p}$	max.	0.25	$\mu A$
Output current, peak	$I_{as,p}$	max.	0.6	$\mu A$ <sup>1)</sup>
Faceplate illumination	E	max.	5000	lx
Faceplate temperature, storage and operation	t	max.	80	$^{\circ}C$ <sup>2)3)</sup>
Cathode heating time before drawing cathode current	$T_h$	min.	1	min ←

- 1) Video amplifiers should be capable of handling signal-electrode currents of this magnitude without overloading.
- 2) Under difficult environmental conditions a flow of cooling air directed at the faceplate is recommended.
- 3) Under conditions of high heat irradiation the use of an infra-red absorbing filter is recommended.



**OPERATING CONDITIONS AND PERFORMANCE**

for a scanned area of 9.6 mm x 12.8 mm and a faceplate temperature of  $30 \pm 2^\circ\text{C}$ .

**CONDITIONS**

			Normal	Operation	
			operation	for high resolution	
→	Mesh voltage	$V_{g4}$	425 <sup>1)</sup>	950 <sup>1)</sup>	V
	Focusing electrode voltage	$V_{g3}$	250 to 300	550 to 650	V
	Accelerator voltage	$V_{g2}$	300	300	V
	Grid no. 1 voltage	$V_{g1}$	Adjusted for sufficient beam current to stabilize highlights		
	Blanking voltage, peak-to-peak when applied to g1		50		V
		when applied to cathode		20	
	Field strength at centre of focusing coil (nominal)	H	3200 (40)	4800 <sup>2)</sup> (60) <sup>2)</sup>	A/m <sup>3)</sup> Oe <sup>3)</sup>
	Field strength of adjustable alignment coils	H	0 to 320 (0 to 4)	0 to 320 (0 to 4)	A/m <sup>4)</sup> Oe <sup>4)</sup>

**PERFORMANCE**

			min.	typ.	max.	
	Signal electrode voltage for dark current of 20 nA	$V_{as}$				
		XQ1240	30	45	60	V
		XQ1241	20	40	60	V
	Grid no. 1 voltage for picture cut-off, with no blanking applied	$V_{g1}$	-30	-55	-100	V
	Signal current faceplate illumination 8 lx c.t. 2856 K	$I_s$				
→		XQ1240	150	200		nA <sup>5)6)</sup>
		XQ1241	110	180		nA
→	Decay: residual signal current 200 ms after cessation of the illumination (8 lx, 2856 K)			8	15	% <sup>5)</sup>

Notes: see page 5.

	Normal operation	Operation for high resolution	
Limiting resolution at picture centre	750	1000	7) TV lines
Modulation depth at 400 TV lines at picture centre	typ. 50	65	% 8)
Average $\gamma$ of transfer characteristic for signal currents between 0.01 $\mu\text{A}$ and 0.3 $\mu\text{A}$	0.7	0.7	
Spurious signals (spots and blemishes)	See note 9)		

**NOTES**

- 1) The optimal grid no. 4 voltage for best uniformity of black and white level depends on the type of coil unit used and will be 1.6 times  $V_{g3}$  for the coil units mentioned under "Accessories". Under no circumstances should grid no. 4 (mesh) be allowed to operate at a voltage level below the  $V_{g3}$  level, since this may damage the target. ←
- 2) Because of the higher deflecting and focusing power required to produce adequate field strength the tube temperature will increase and adequate provisions for cooling should be made.
- 3) The polarity of the focusing coil should be such that a north-seeking pole is attracted to the image end of the focusing coil, with this pole located outside of and at the image end of the focusing coil.
- 4) The alignment coil unit should be positioned on the tube so that its centre is at a distance of approx. 94 mm (3 11/16 in) from the face of the tube and that its axis coincides with the axis of the tube, the deflecting yoke and the focusing coil.
- 5) Signal-electrode voltage adjusted for a dark current of 20 nA.
- 6) Signal current is defined as the component of the output current after the dark current has been subtracted.
- 7) Measured with a video amplifier system having an appropriate bandwidth.
- 8) Square wave response. Measured with a lens aperture of f5.6, a peak signal current  $I_{Sp} = 0.15 \mu\text{A}$  and a beam current sufficient to stabilize a signal current of 0.5  $\mu\text{A}$ .



9) Conditions :

The camera focused on a uniformly illuminated two-zone test pattern, the diameter of the centre zone (1) being equal to the raster height. Zone (2) being defined as the remainder of the scanned area. Signal electrode voltage adjusted for a dark current of 20 nA, illumination on the target 8 lx, (c.t. = 2856 K).

Scanning amplitudes of the monitor adjusted to obtain a raster with an aspect ratio of 3 : 4.

Monitor set-up and contrast control adjusted for faint raster when lens of camera is capped, and for non-blooming bright raster when lens of camera is uncapped.

Under the above conditions the number and size of the spots visible in the monitor picture will not exceed the limits stated below. Both black and white spots must be counted unless the amplitude is less than 10% (XQ1240), or less than 25% (XQ1241) of the peak white signal.

XQ1240

Spot size in % of raster height	Maximum number of spots	
	zone 1	zone 2
> 1	none	none
1 to 0.6	none	none
0.6 to 0.2	1	2
≤ 0.2	*	*

XQ1241

Spot size in % of raster height	Maximum number of spots	
	zone 1	zone 2
> 1	none	none
1 to 0.6	1	3
m 0.6 to 0.2	3	5
≤ 0.2	*	*
max. 8		

\* Do not count spots of this size unless concentration causes a smudgy appearance.

- a) Minimum separation between any two spots greater than 0.2% of raster height is limited to a distance equivalent to 5% of raster height.
- b) Tubes are rejected for smudge, lines, streaks, mottled, grainy or uneven background having contrast ratios in excess of 10% (XQ1240), respectively 25% (XQ1241).