

This information is derived from development samples made available for evaluation. It does not form part of our data handbook system and does not necessarily imply that the device will go into production

MONITOR TUBES

- 90° deflection angle
- 24 cm (9 in) face diagonal; rectangular glass
- 20 mm neck diameter
- white or green screen phosphor

QUICK REFERENCE DATA

Deflection angle	90°
Face diagonal	24 cm (9 in)
Overall length	227 mm
Neck diameter	20 mm
Heating	11 V/140 mA
Grid 2 voltage	130 V
Cathode	quick heating

APPLICATION

These monitor tubes are used for information display and data terminals, e.g. in video monitoring equipment, computer terminals, word processors.

The tubes are supplied with different screen phosphors: white (W) or green (GH and GR). They are available with safety panels, which are etched to avoid reflections of light sources.

The tubes can be supplied with additional deflection unit.

AVAILABLE VERSIONS

monitor tubes without etched safety panel without lugs	M24 - 300 W M24 - 300 GH M24 - 300 GR
monitor tubes with etched safety panel without lugs	M24 - 301W M24 - 301GH M24 - 301GR
monitor tubes without etched safety panel with lugs	M24 - 302W M24 - 302GH M24 - 302GR
monitor tubes with etched safety panel with lugs	M24 - 303W M24 - 303GH M24 - 303GR

blue binder, tab 3



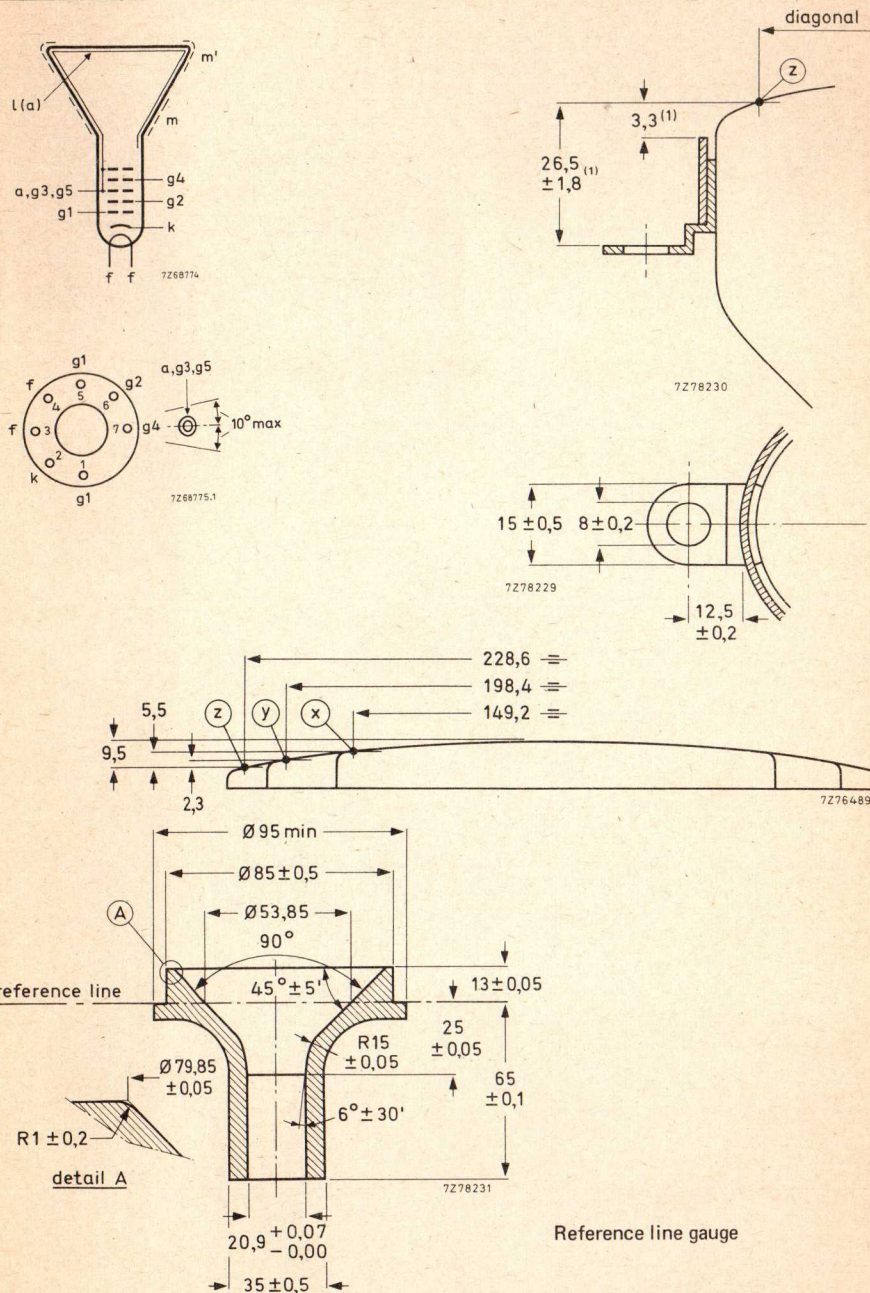
ELECTRICAL DATA

Focusing method	electrostatic
Deflection method	magnetic
Deflection angles	
diagonal	approx. 90°
horizontal	approx. 82°
vertical	approx. 67°
Direct interelectrode capacitances	
cathode to all other electrodes	approx. 3 pF
grid 1 to all other electrodes	approx. 7 pF
external conductive coating to anode	max. 750 pF min. 300 pF
Heater voltage	11 V
Heater current at 11 V	140 mA
Electron gun	
ion trap	none
focus lens	unipotential

OPTICAL DATA

Phosphor number	W, GH and GR (P4, P31 and P39 respectively, according to JEDEC)
Light transmission at centre	
of face plate	approx. 53%
of safety panel	approx. 61%
Anti-reflection treatment	etched safety panel (if present)





(1) If a safety panel is present, this dimension has to be increased with approx. 6,5 mm.

MECHANICAL DATA (see also the figures on pages 8 and 9)

Overall length	max. 227 mm
Greatest dimensions of tube	
diagonal	247 mm
width	216 mm
height	167 mm
Minimum useful screen dimensions (projected)	
diagonal	228,6 mm
horizontal axis	198,4 mm
vertical axis	149,2 mm
area	285 cm ²
Implosion protection	T-band or safety panel
Bulb	EIA-J240A1
Bulb contact designation	IEC67-III-2; JEDEC J1-21
Base designation	JEDEC E7-91
Basing	7GR
Mass, without safety panel	approx. 1,8 kg

RATINGS (Absolute Maximum System); cathode drive

Unless otherwise specified voltage values are positive and measured with respect to grid 1.

Anode voltage	max. 18 kV	min. 11 kV
Grid 4 (focusing electrode) voltage	-200 to + 500 V	
Grid 2 voltage	max. 200 V*	
Cathode voltage to grid 1		
negative bias value	max. 0 V	
negative peak value	max. 2 V	
positive bias value	max. 200 V	
positive peak value	max. 400 V	
Heater voltage	max. 12,7 V**	min. 9,3 V**
Cathode-to-heater voltage	max. 200 V	

DEVELOPMENT SAMPLE DATA

* Improved sharpness is obtainable with increased grid 2 voltage (higher resolution).

** For maximum cathode life it is recommended that the heater supply be regulated at 11 V.



TYPICAL OPERATING CONDITIONS; cathode drive

Voltages are specified with respect to grid 1.

Anode voltage	16 kV	
Grid 4 (focusing electrode) voltage	-100 to + 200 V	note 1
Grid 2 voltage	130 V	note 2
Cathode voltage	30 to 50 V	note 3

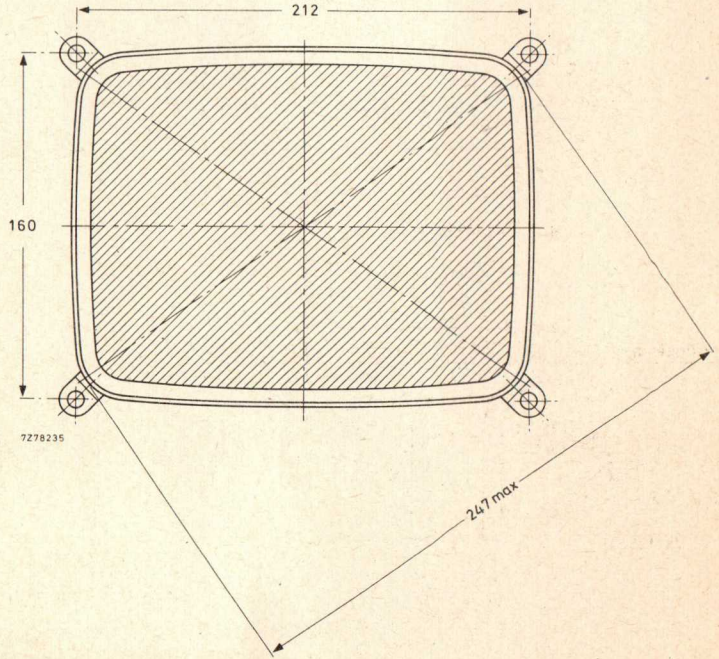
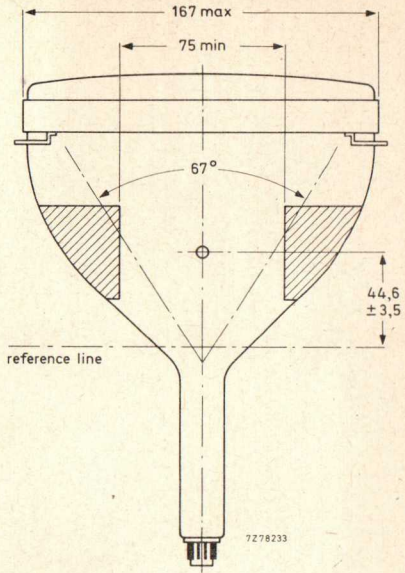
MAXIMUM CIRCUIT VALUES

Grid 1 circuit resistance	max. 1,5 MΩ
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X-RADIATION CHARACTERISTIC

X-radiation emitted will not exceed 0,5 mR/h throughout the useful life of the tube, when operated within the given ratings. See curves on the opposite page.

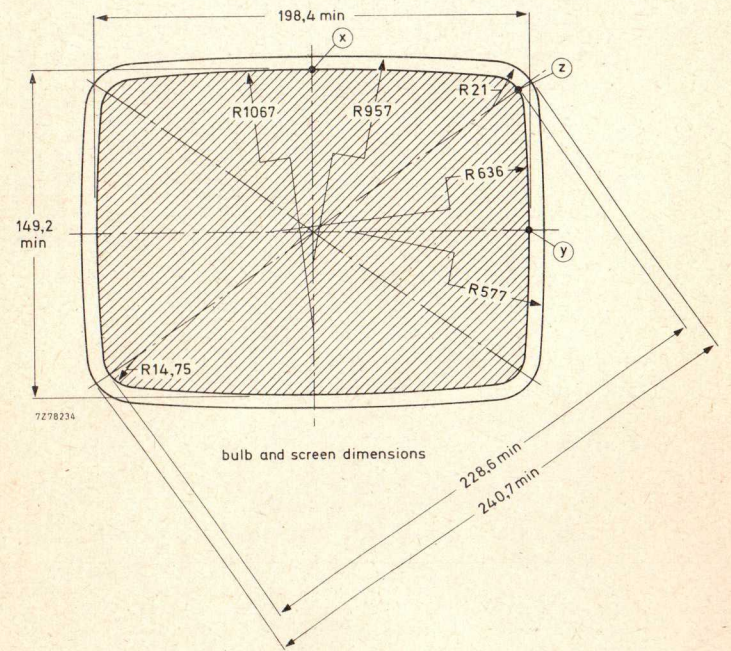
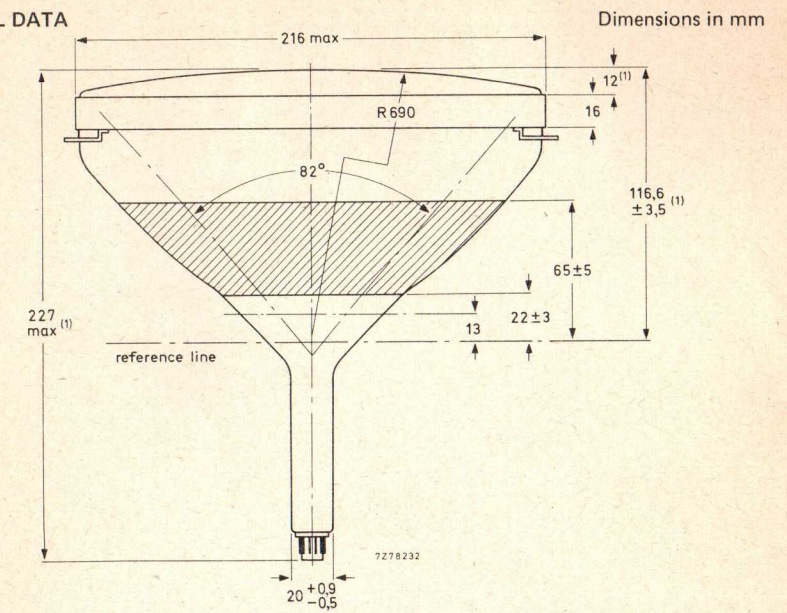
DEVELOPMENT SAMPLE DATA



Notes

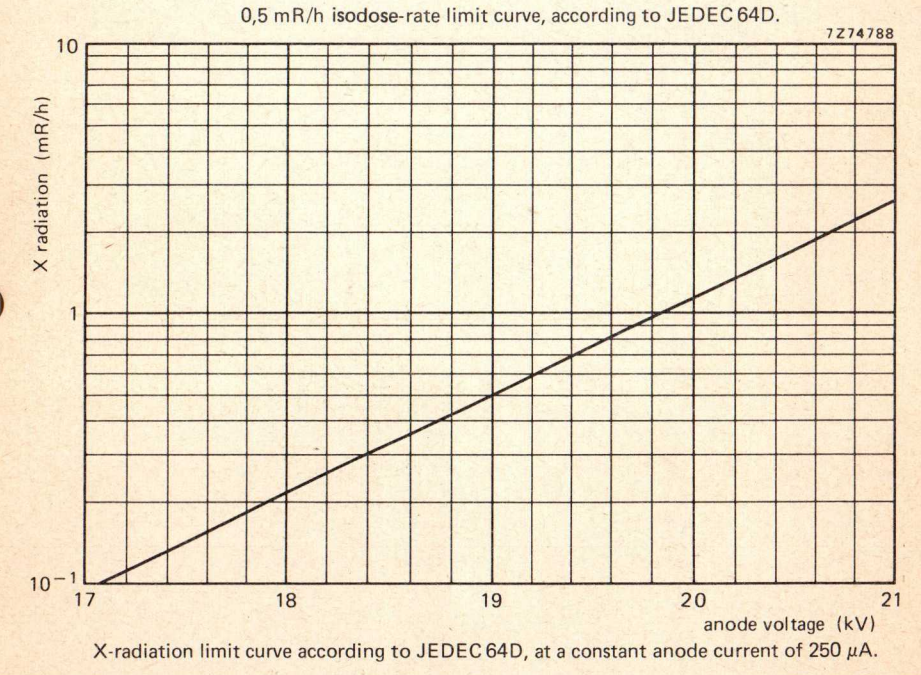
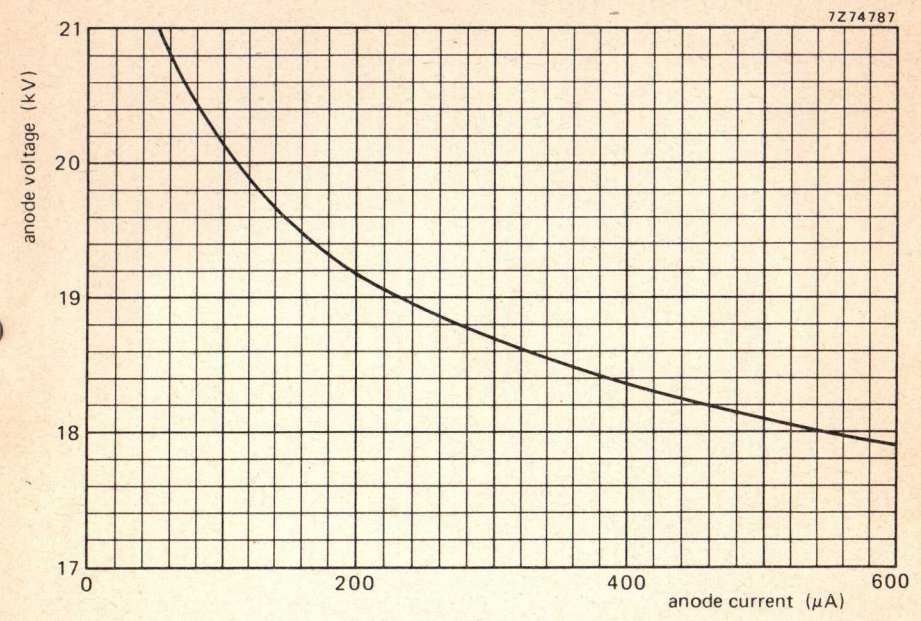
1. Because of the flat focus characteristic it is sufficient to choose a focusing voltage between 0 and 130 V (e.g. two taps, 0 V and 130 V). The optimum focus voltage of individual tubes may be between -100 and + 200 V.
2. Improved picture sharpness is obtainable with increased grid 2 voltage (higher resolution).
3. Visual extinction of focused raster.

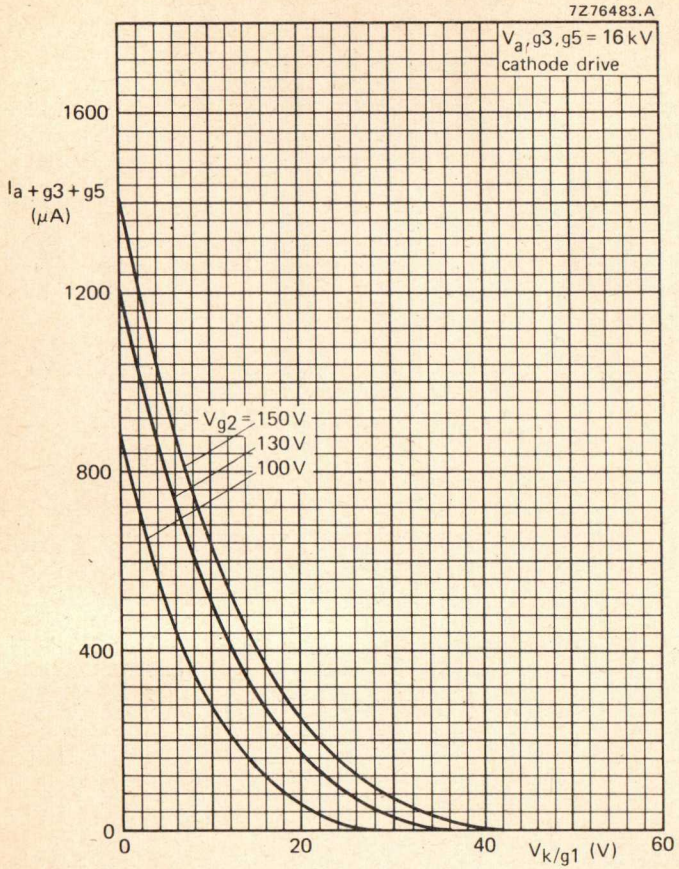
DIMENSIONAL DATA



(1) If a safety panel is present, this dimension has to be increased with approx. 6,5 mm.

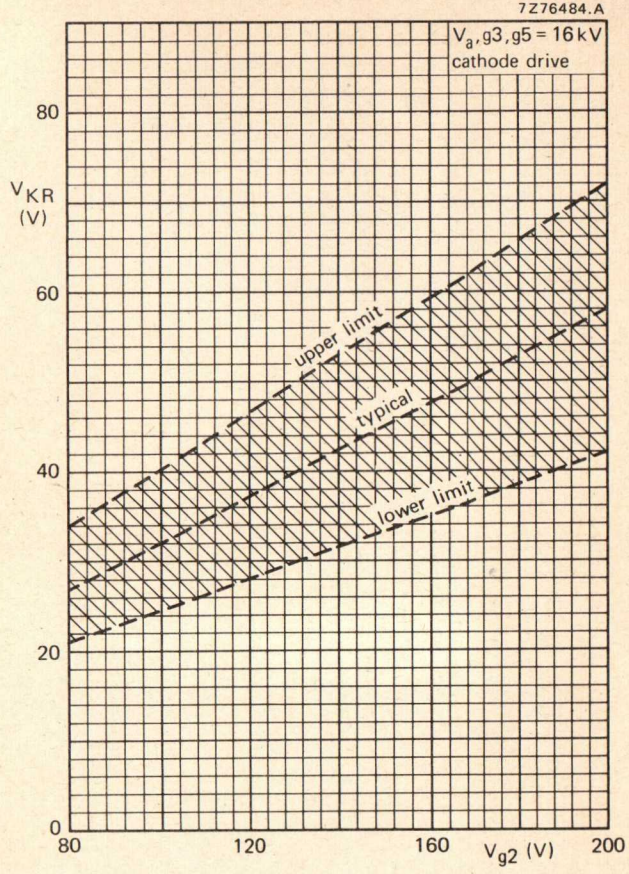
DEVELOPMENT SAMPLE DATA





Final accelerator current as a function of cathode voltage.

DEVELOPMENT SAMPLE DATA



Limits of cathode cut-off voltage as a function of grid 2 voltage.

$$\frac{\Delta V_{KR}}{\Delta V_{a,g3,g5}} = 0,3 \times 10^{-3}$$

