MONITOR TUBES

- 90° deflection angle
- 31 cm (12 in) face diagonal; rectangular glass
- 20 mm neck diameter
- white or green screen phosphor

QUICK REFERENCE DATA

Deflection angle	90°
Face diagonal	31 cm (12 in)
Overall length	280 mm
Neck diameter	20 mm
Heating	11 V/140 mA
Grid 2 voltage	130 V
Cathode	quick heating

blue binder, tab 3

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 or 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

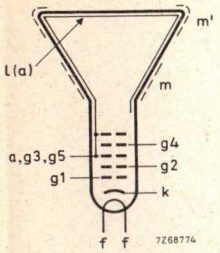
	non-push-through versions	push-through versions
monitor tubes without etched safety panel without lugs	M31-330W M31-330GH M31-330GR	
monitor tubes with etched safety panel without lugs	M31-331W M31-331GH M31-331GR	
monitor tubes without etched safety panel with lugs	M31-334W M31-334GH M31-334GR	M31-332W M31-332GH M31-332GR
monitor tubes with etched safety panel with lugs	M31-333W M31-333GH M31-333GR	

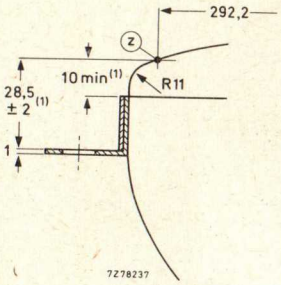
ELECTRICAL DATA

Focusing method	electrostatic
Deflection method	magnetic
Deflection angles	
diagonal	approx. 90°
horizontal	approx. 83°
vertical	approx. 65°
Direct interelectrode capacitances	
cathode to all other electrodes	approx. 5 pF
grid 1 to all other electrodes	approx. 8 pF
external conductive coating to anode	max. 900 pF
	min. 450 pF
Heater voltage	11 V
Heater current at 11 V	140 mA
Electron gun	
ion trap	none
focus lens	unipotential

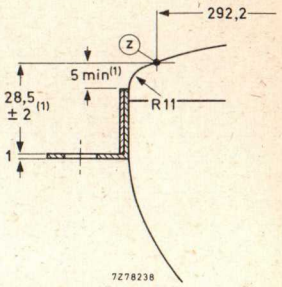
OPTICAL DATA

Phosphor number	W, GH and GR (P4, P31 and P39 respectively, according to JEDEC)
Light transmission at centre	
of face plate	approx. 50%
of safety panel	approx. 61%
Anti-reflection treatment	etched safety panel (if present)

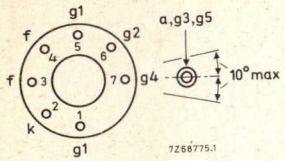


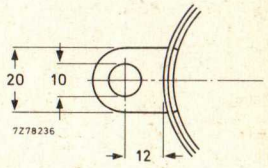


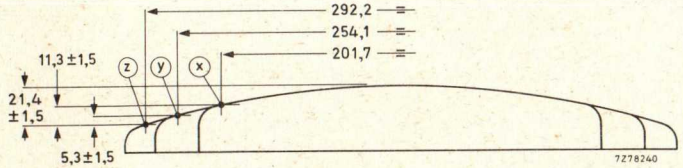
Push-through version.

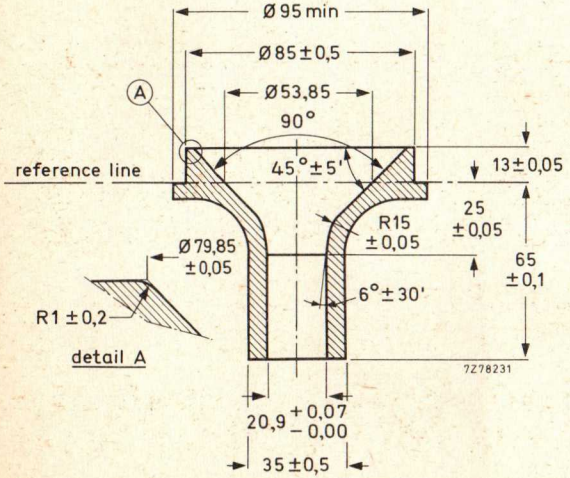


Non-push-through version.









Reference line gauge

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

DEVELOPMENT SAMPLE DATA

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

Overall length	max. 280 mm
Greatest dimensions of tube	
diagonal	315 mm
width	279 mm
height	227 mm
Minimum useful screen dimensions (projected)	
diagonal	292,2 mm
horizontal axis	254,1 mm
vertical axis	201,7 mm
area	483 cm²
Implosion protection	T-band or safety panel
Bulb	EIA-J97 3/4M
Bulb contact designation	IEC 67-III-2; JEDEC J1-21
Base designation	JEDEC E7-91
Basing	7GR
Mass, without safety panel	approx. 2,9 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	−500 to + 1000	V
Grid 2 voltage	max.	200 V*
Cathode-to-grid 1 voltage		
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

* Improved picture 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

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.

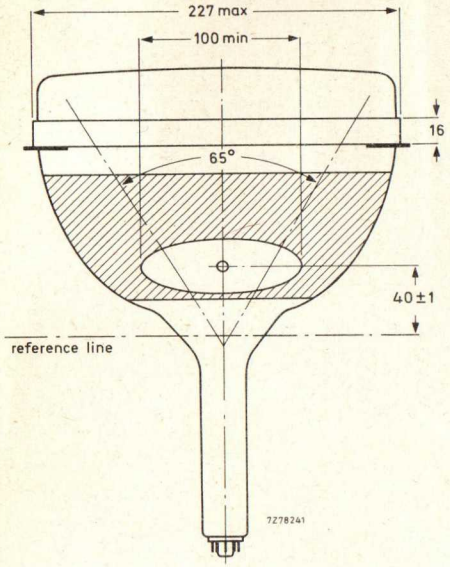
Notes

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.

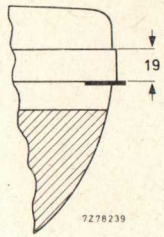
PHILIPS

M31-330 SERIES

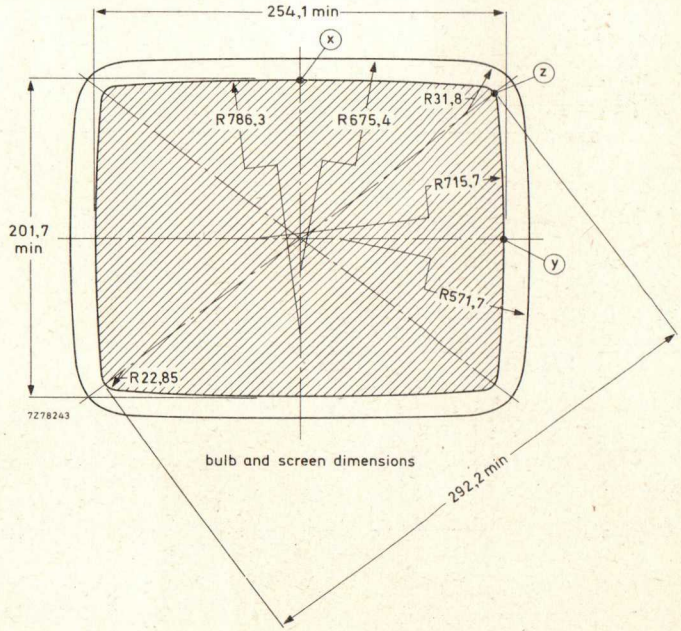
DEVELOPMENT SAMPLE DATA



Push-through version.



Non-push-through version.

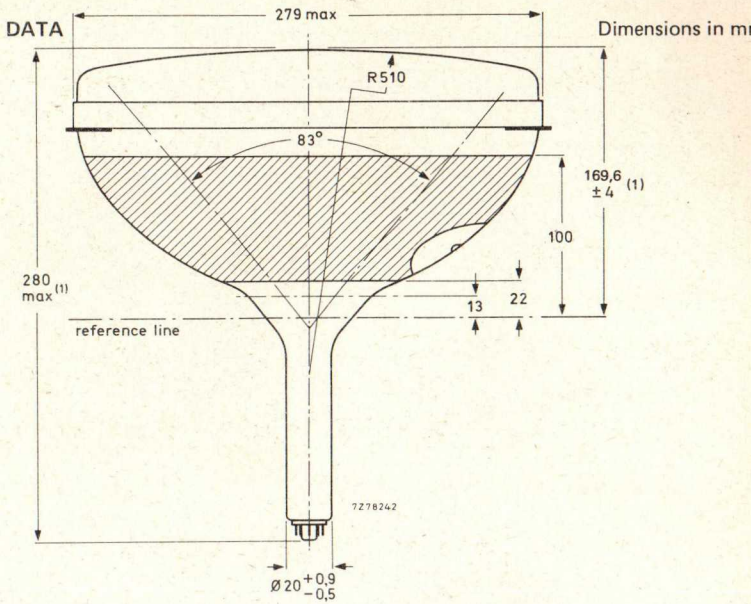


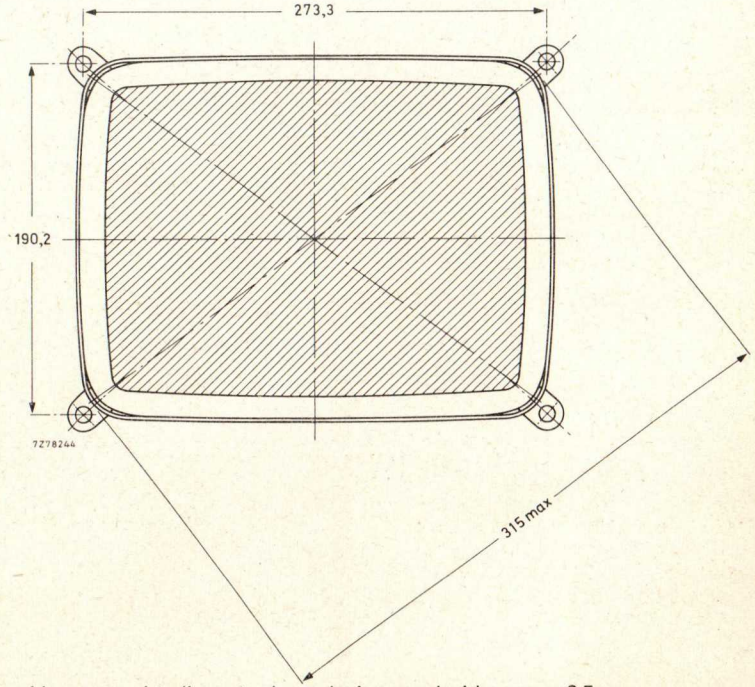
bulb and screen dimensions

PHILIPS

DIMENSIONAL DATA

Dimensions in mm





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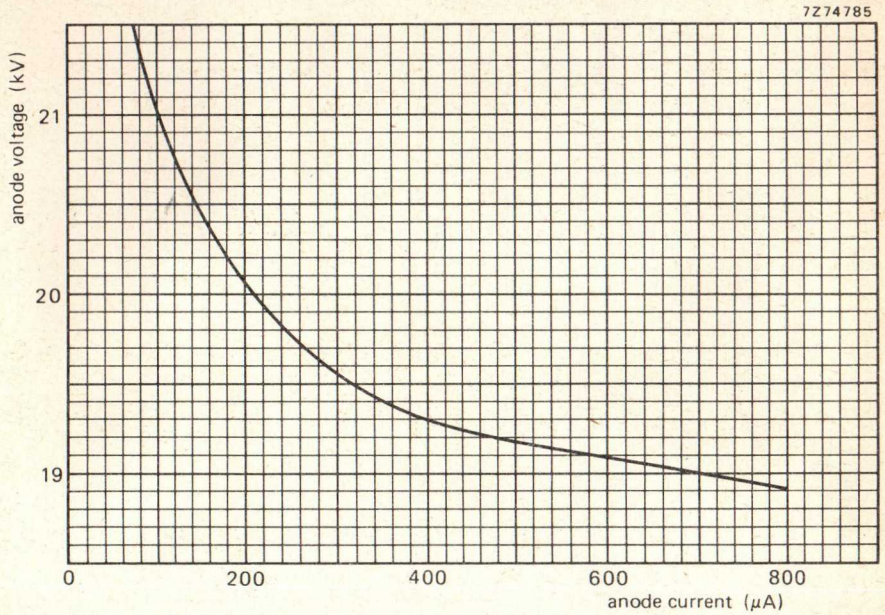
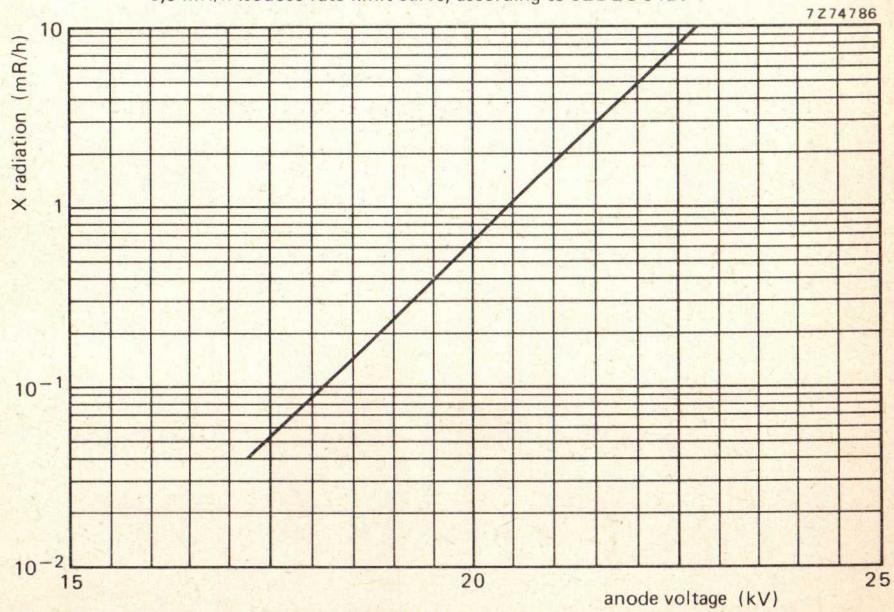
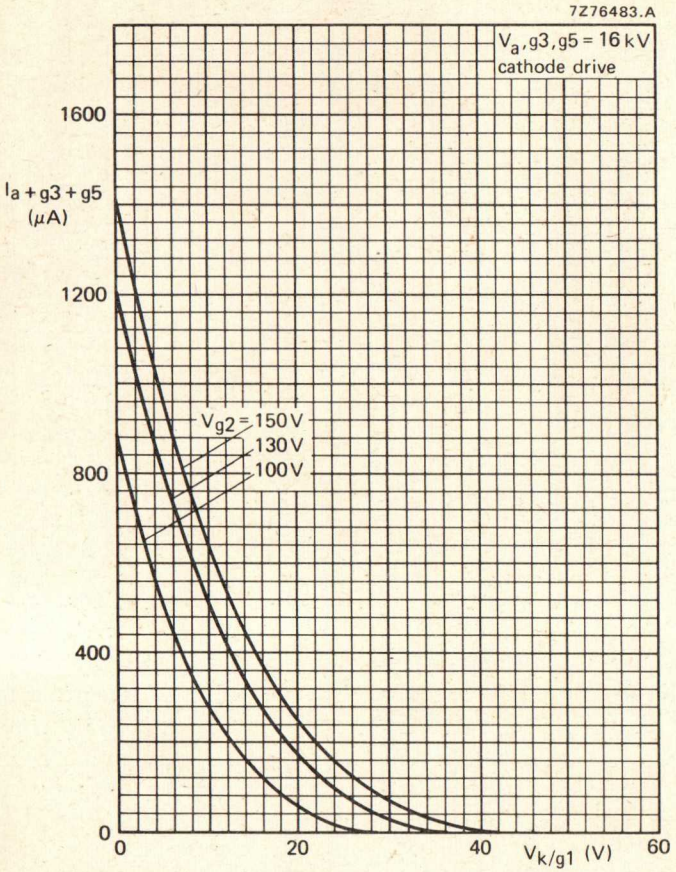
DEVELOPMENT SAMPLE DATA



0,5 mR/h isodose-rate limit curve, according to JEDEC 64D.

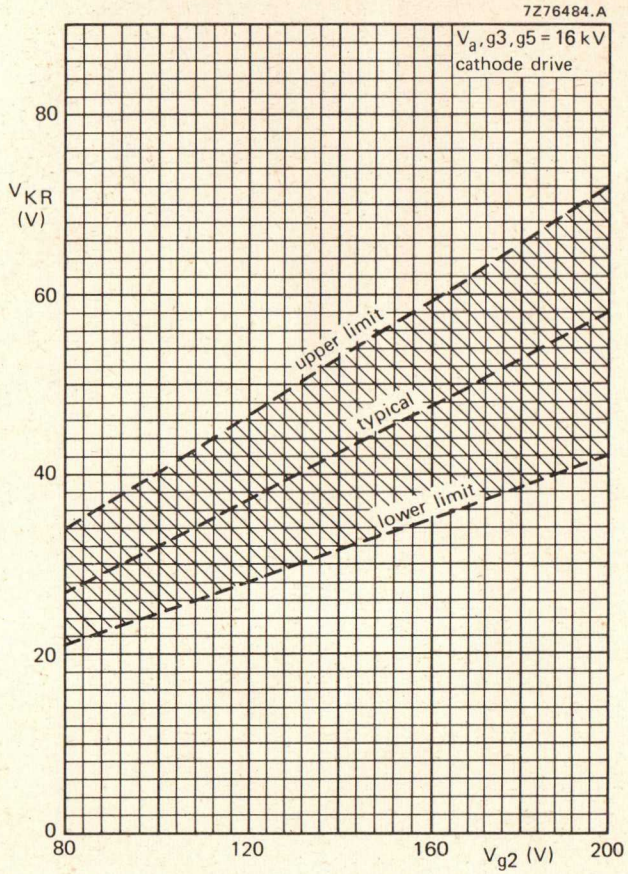


X-radiation limit curve according to JEDEC 64D at a constant anode current of 250 μA.



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.

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