Dieter’s

Nixie Tube Data Archive

This file is a part of Dieter's Nixie- and display tubes data archive

If you have more datasheets, articles, books, pictures or other information about Nixie tubes or other display devices please let me know.
Thank you!

Document in this file	Philips datasheet – ZM1050
Display devices in this document	Z550M, ZM1050

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INDICATOR TUBE

Formely Z550M

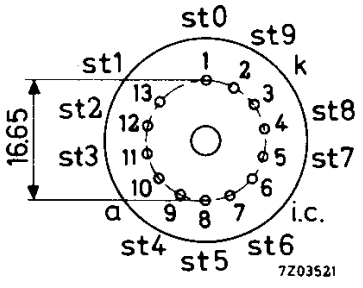
Cold cathode numerical indicator tube for top viewing.

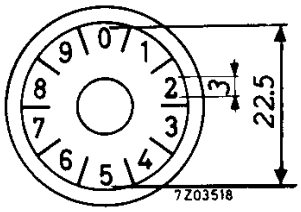
QUICK REFERENCE DATA			
Numeral height		3	mm
Numerals	1 2 3 4 5 6 7 8 9 0		
Supply voltage	V_{ba}	90	Va.c.
Cathode current	I_k	3	mA
Starter selecting voltage		5	V

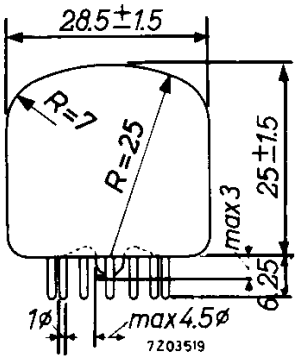
DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: B13B







GENERAL

The 3 mm high numerals are displayed in radial form.
The tube is primarily intended for use in circuits with transistor control.

PRINCIPLE OF OPERATION

The pulsating d.c. supply voltage (preferably half sine waves) causes one of the ten pure molybdenum cathode positions to glow. This position will be determined by the voltage level of corresponding starter being a few volts above the level of the remaining starters.

ACCESSORIES

Socket 2422 505 00001 or 2422 505 00002

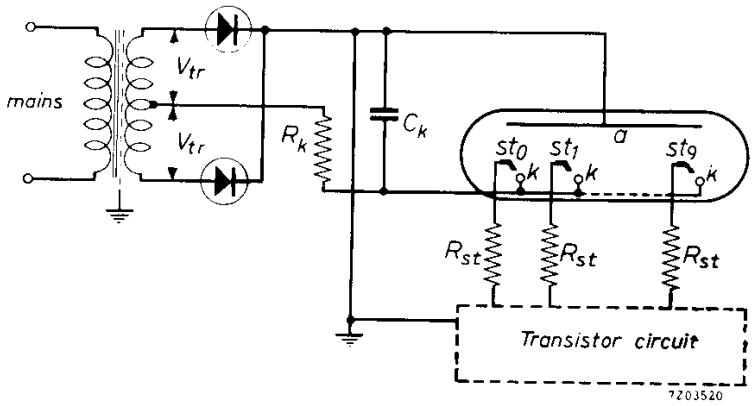
MOUNTING POSITION

Any

The numerals are viewed through the dome of the envelope.
The numerals appear upright when the tube is mounted with the line through pins 1 and 8, vertical pin 1 being uppermost.
Number 0 is aligned with pin 1 to within 3°.

CHARACTERISTICS AND OPERATING CONDITIONS

Recommended circuit



Transformer secondary voltage	V_{tr}	110	V ± 10% [1]
Cathode resistor	R_k	10	kΩ ± 5%
Starter series resistor	R_{st}	330	kΩ [2]
Shunting capacitor	C_k	33	nF [1]
Starter selecting voltage	V_{st-st}	See sheet 4 upper figure and [2] on page 3	
Starter current	I_{st}	50	μA
Maintaining voltage	V_m	84	V
Recommended cathode current	I_k	3	mA

[1]) The rectified a.c. voltage should be free from spikes.
A shunting capacitor C_k of 33 nF serves this purpose.

[2]) This resistor should be mounted close to the tube socket.

LIFE EXPECTANCY at recommended operating conditions and room temperature

Continuous display of one digit	1000	h	[1]
Sequentially changing the display from one digit to the others every 100 h or less	min. 20 000	h	

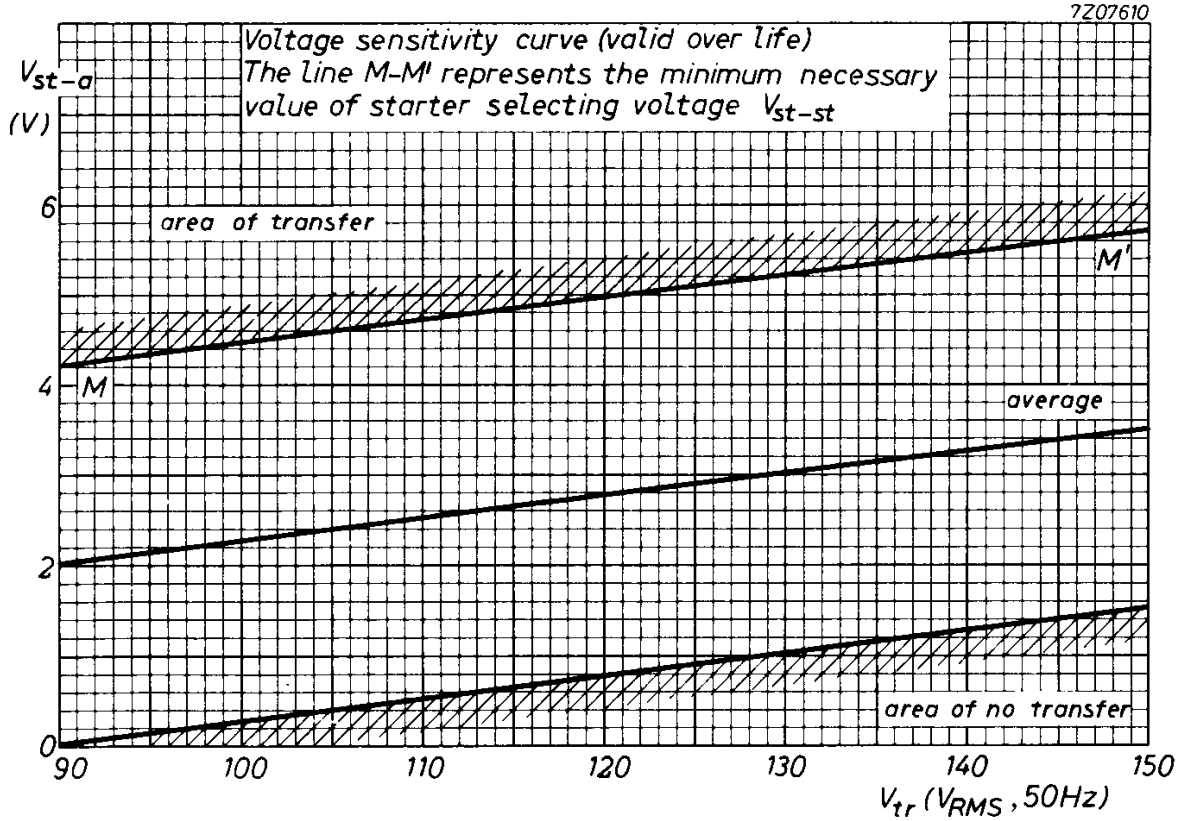
The criterium for the end of life point is given by the minimum value of starter selecting voltage V_{st-st} shown on sheet 4 upper figure.

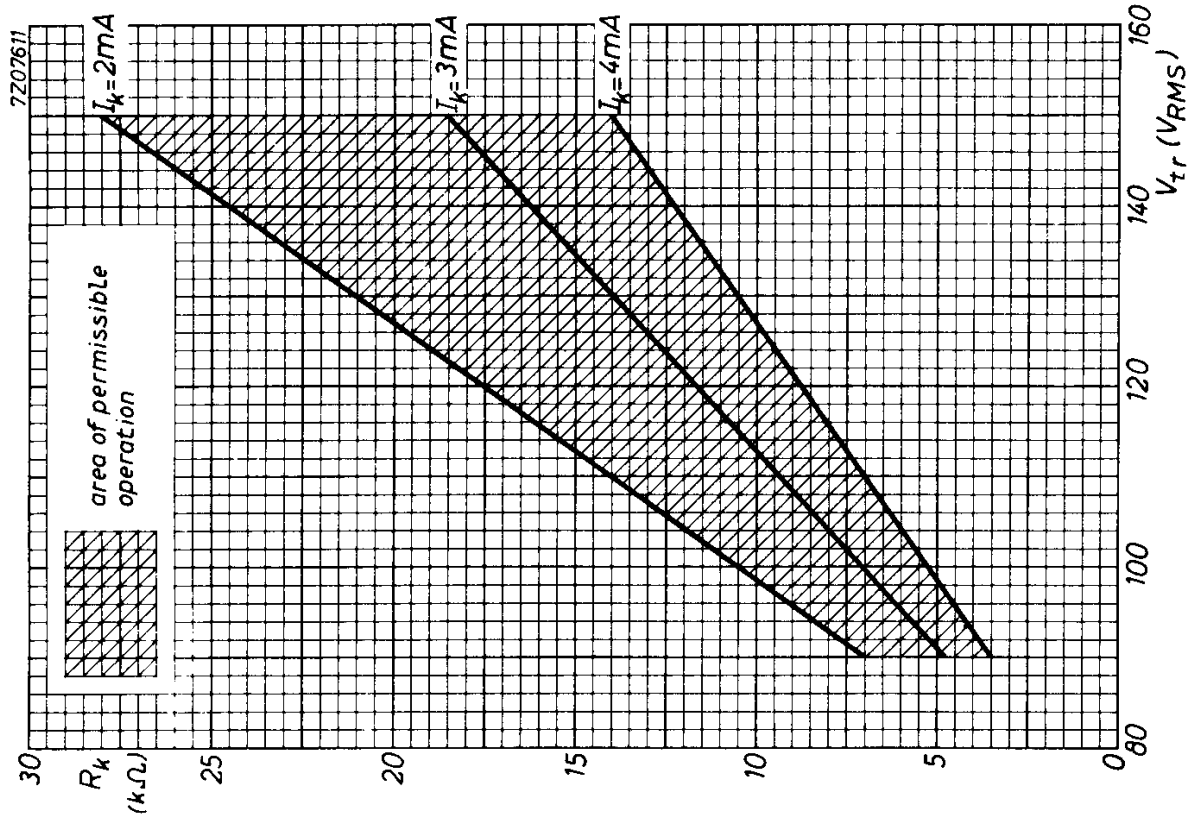
LIMITING VALUES (Absolute max. rating system)

A.C. supply voltage	V_{tr}	min.	90	$V_{r.m.s.}$
See also sheet 4 lower figure	V_{tr}	max.	150	$V_{r.m.s.}$
Frequency of mains supply	f		40 to 100	Hz
Cathode current (average)	I_k	min.	2	mA
		max.	4	mA
Starter selecting voltage	V_{st-st}	min.	see sheet 4 upper figure [2]	
		max.	30	V
Starter circuit resistance	R_{st}	min.	100	kΩ
		max.	470	kΩ
Envelope temperature	t_{bulb}	min.	−55	°C
		max.	+70	°C

[1] Under conditions of longer continuous display on one digit it is recommended to apply a starter selecting voltage V_{st-st} greater than the minimum value, as indicated on sheet 4 upper figure.

[2] The common starter bias potential may deviate by a maximum of ± 5 V from the anode potential.


7Z07610
Voltage sensitivity curve (valid over life)
The line M-M' represents the minimum necessary value of starter selecting voltage V_{st-st}
V_{st-a} (V)
area of transfer
M
M'
average
area of no transfer
0
2
4
6
90
100
110
120
130
140
150
V_{tr} (V_{RMS}, 50Hz)


7Z07611
I_k=2mA
I_k=3mA
I_k=4mA
area of permissible operation
R_k (kΩ)
30
25
20
15
10
5
0
80
100
120
140
160
V_{tr} (V_{RMS})