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: ZM1174, ZM1175, ZM1176, ZM1177
Display devices in this document	ZM1174, ZM1175, ZM1176, ZM1177

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INDICATOR TUBE

Long life cold cathode ten digit numeral indicator tube for side viewing.

QUICK REFERENCE DATA			
Numeral height		15.5	mm
Numerals	0 1 2 3 4 5 6 7 8 9		
Decimal point	see "General"		
Supply voltage	min.	170	V
Numeral cathode current		2.5	mA
Decimal point cathode current		0.5	mA
Distance between mounting centres	min.	19	mm

GENERAL

The numerals are 15.5 mm high and appear on the same base line allowing in-line read out. The four types are electrically identical but differ in the position of the decimal point and the inclusion of a red contrast filter.

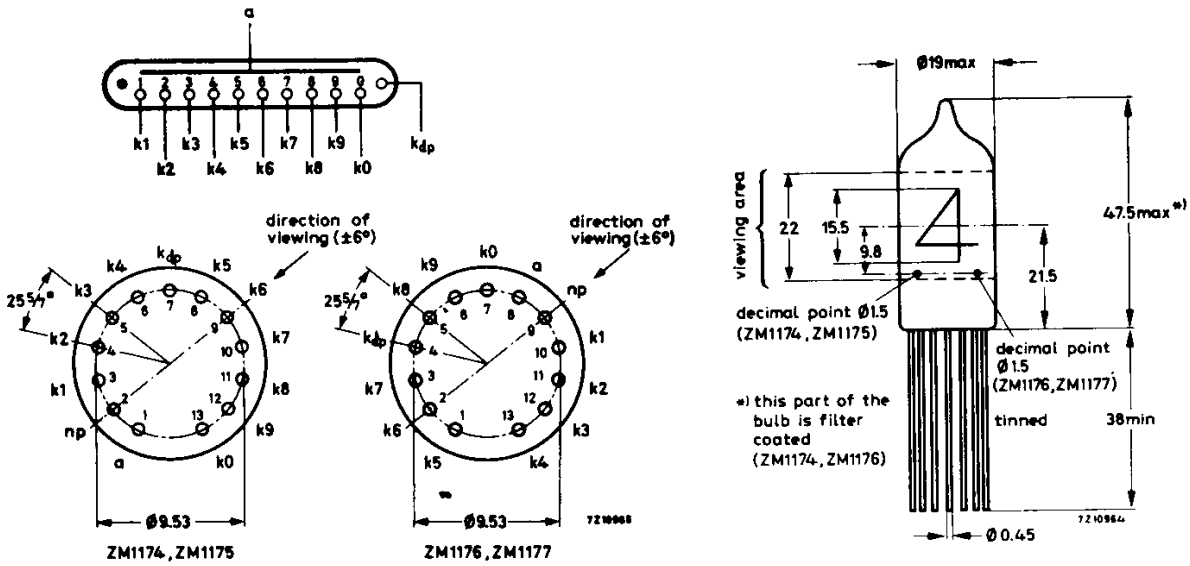
ZM1174 Decimal point on the left hand side. Red contrast filter.
ZM1175 Decimal point on the left hand side. No filter.
ZM1176 Decimal point on the right hand side. Red contrast filter.
ZM1177 Decimal point on the right hand side. No filter.

PRINCIPLE OF OPERATION

The tube contains ten cathodes in the form of ten figures and one in the form of a decimal point, and a common anode. By applying a suitable voltage between the anode and one of the cathodes the corresponding figure or decimal point will be covered by a red neon glow.

DIMENSIONS AND CONNECTIONS

Dimensions in mm



Data based on pre-production tubes.

Mounting position: any

The numerals and the decimal point are viewed through the side of the envelope. The numerals will appear upright (within ± 3 °) when the tube is mounted vertically, base down.

Soldering

The tube may be soldered directly into the circuit, but heat conduction to the glass-to-metal seals should be kept to a minimum by the use of a thermal shunt. The leads may be dip-soldered to a minimum of 5 mm from the seals at a solder temperature of 240 °C for a maximum of 10 s.

Note

Care should be taken not to bend the leads nearer than 1.5 mm from the seals.

CHARACTERISTICS AND OPERATING CONDITIONS (at 20 °C to 50 °C)

Ignition voltage	V_{ign}	max.	170	V
Mainting voltage	V_m		see page 3	
Numeral cathode current,				
recommended average	I_k		2.5	mA
average (T_{av} = 10 ms)	I_k	max.	3.5	mA
average, averaged over any conduction period	I_k	min.	1.5	mA 1)
peak	I_{kp}	max.	12	mA
Decimal point cathode current				
recommended average	I_{kdp}		0.5	mA
average, averaged over any conduction period	I_{kdp}	min.	0.05	mA 2)
peak	I_{kdpp}	max.	2.5	mA
Extinguishing voltage	V_{ext}		115	V

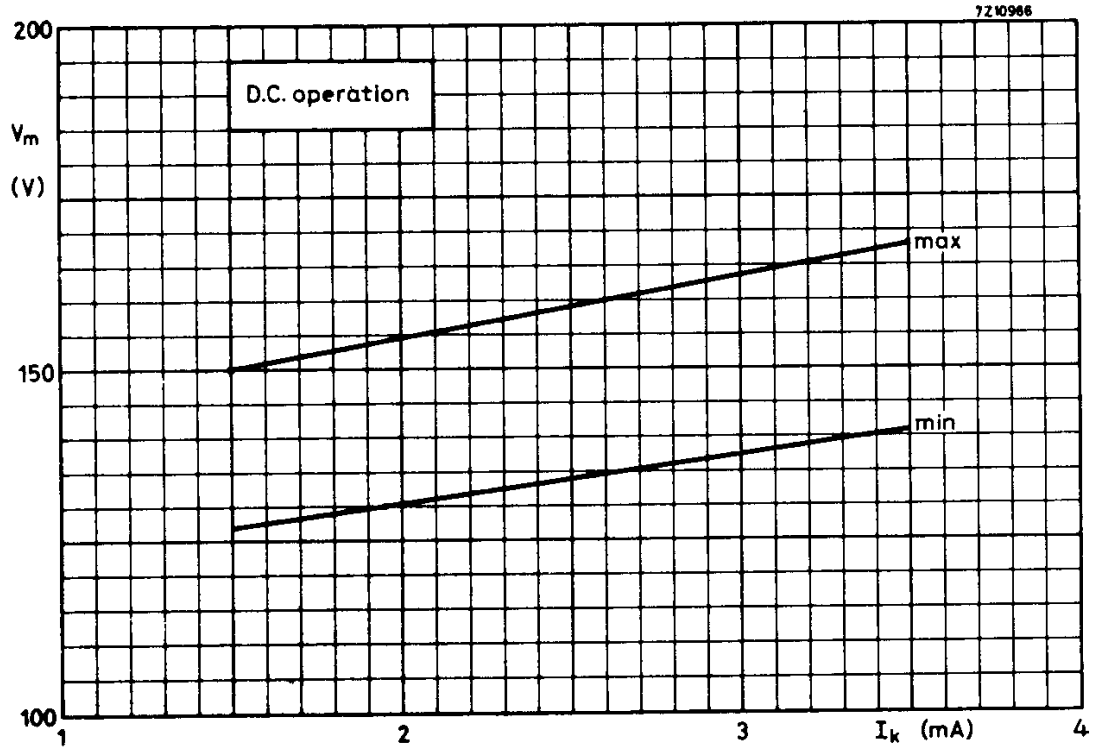
LIFE EXPECTANCY at I_k = 2.5 mA and room temperature. 3)

Continuous display of one numeral	>	5000	h
Sequentially changing the display from one numeral to another, every 100 h or less	>	30 000	h

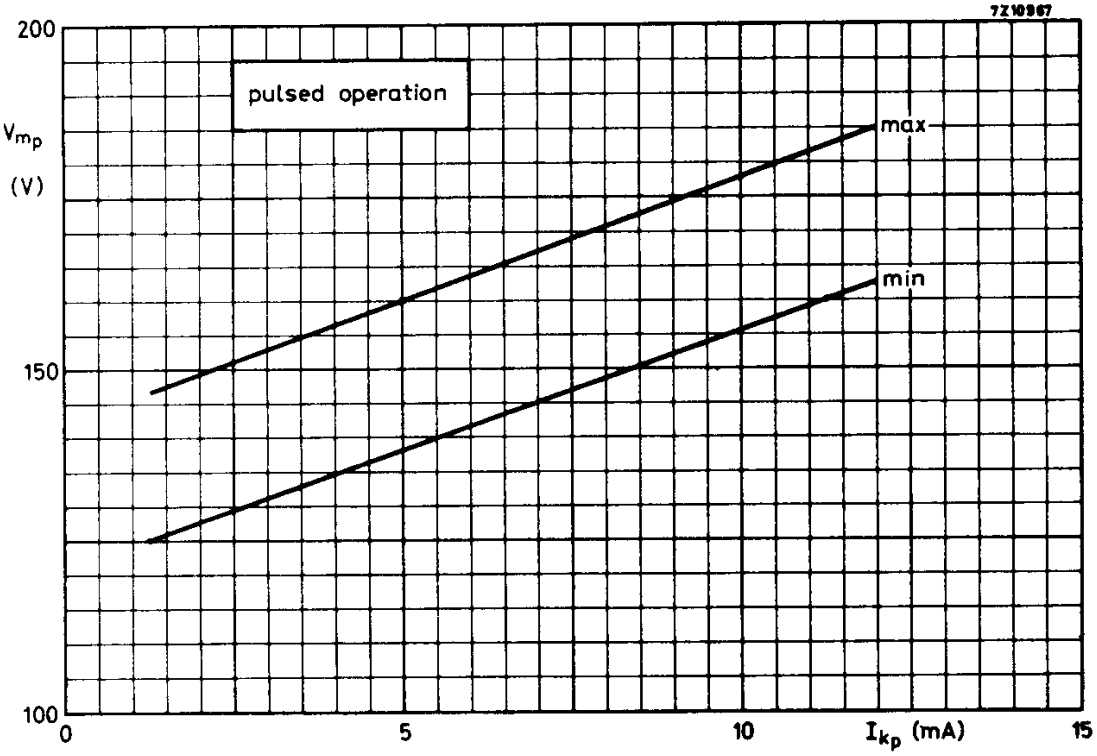
LIMITING VALUES (Absolute max. rating system)

Numeral cathode current				
average, T_{av} = 10 ms	I_k	max.	3.5	mA
peak	I_{kp}	max.	12	mA
average during any conduction period	I_k	min.	1.5	mA
Pulse duration	T_{imp}	min.	100	μs
Bulb temperature	t_{bulb}	max.	+70	°C
	t_{bulb}	min.	-50	°C 3)

1) This value applies, irrespective of wether the decimal point is running or not.
2) These conditions are automatically satisfied when the decimal point is directly connected to the numeral cathode carrying the main discharge. When the decimal point is connected in this way the max. decimal point current is 0.15 mA at a numeral cathode current of 1.5 mA.
3) For bulb temperatures below 0 °C the life expectancy of the tube is substantially reduced.



ANODE-TO-CATHODE MAINTAINING VOLTAGE
AS A FUNCTION OF CATHODE CURRENT



PEAK ANODE-TO-CATHODE MAINTAINING VOLTAGE
AS A FUNCTION OF PEAK CATHODE CURRENT